HANDBOOK OF THE BIRDS OF THE WORLD

Edited by
Josep del Hoyo
Andrew Elliott
David Christie

Volume 9

Cotingas
to
Pipits and
Wagtails





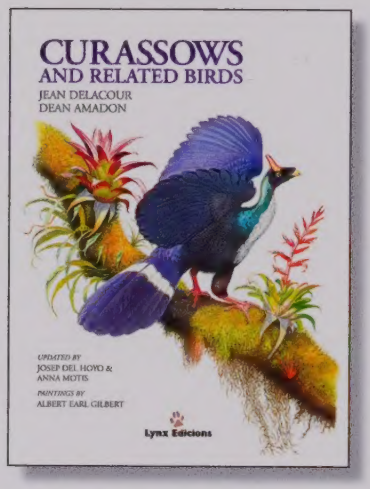
Lynx Edicions

BirdLife INTERNATIONAL

After the successful publication of
Threatened Birds of the World
in association with BirdLife International



Lynx Edicions is about to publish two other important works in association with world-renowned scientific institutions



Due Summer 2004

In association with the American Museum of Natural History



Due Autumn 2004

In association with the Smithsonian Institution

Jacket illustration by FRANCESC JUTGLAR
Andean Cock-of-the-rock (*Rupicola peruvianus*)
Ochre-breasted Pipit (*Anthus nattereri*)

HANDBOOK OF THE BIRDS OF THE WORLD

Volume 9

Cotingas *to* Pipits and Wagtails



Lynx Edicions

BirdLife INTERNATIONAL

HANDBOOK OF THE BIRDS OF THE WORLD

Volume 9

Cotingas *to* Pipits and Wagtails

Josep del Hoyo
Andrew Elliott
David Christie

Per Alström
Richard Banks
John Bates
Kimberly Bostwick
Michael Brooke
Isabel Caballero
Benjamin Clock
Alan Danks
Paul Donald
Andrew Farnsworth

John Fitzpatrick
Brian Gill
Peter Hosner
Leo Joseph
Eduardo de Juana
Gary Langham
Daniel Lebbin
Alan Lill
Jason Mobley

Mark Robbins
Peter Ryan
Edwin Scholes
David Snow
Francisco Suárez
José Tello
Angela Turner
Stephanie Tyler
Bruno Walther
Kevin Zimmer

Colour Plates by

Norman Arlott
Hilary Burn
John Cox
Ren Hathway
Ian Lewington

Chris Rose
Brian Small
Jan Wilczur
Ian Willis
Tim Worfolk

Consultant for Systematics and Nomenclature

Walter J. Bock

Consultant for Status and Conservation

Nigel J. Collar

Lynx Edicions

Barcelona

Recommended citation:
del Hoyo, J., Elliott, A., & Christie, D.A. eds. (2004). *Handbook of the Birds of the World*. Vol. 9. Cotingas to Pipits and Wagtails. Lynx Edicions, Barcelona.

Citation to individual contributions recommended in the following format:
Snow, D.W. (2004). Family Pipridae (Manakins). Pp. 110-169 in: del Hoyo, J., Elliott, A., & Christie, D.A. eds. (2004). *Handbook of the Birds of the World*. Vol. 9. Cotingas to Pipits and Wagtails. Lynx Edicions, Barcelona.

© Copyright Lynx Edicions 2004

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording or any information retrieval system without the prior written permission of the copyright holders.

Printed on paper manufactured by Burgo in a totally acid-free water system.

Colour reproductions by *Edifilm, S.A.* Barcelona
Printed and bound in Barcelona by *Grafos, S.A. Arte sobre papel*
Dipòsit Legal: B-34.229-2004
ISBN: 84-87334-69-5

Authors of Volume 9

Dr P. Alström
Department of Systematic Zoology, Evolutionary Biology Centre, Uppsala University, Sweden.

Dr R. C. Banks
Zoologist Emeritus, USGS Patuxent Wildlife Research Center, Laurel, Maryland, USA; and Research Associate, National Museum of Natural History, Washington, DC, USA.

Dr J. M. Bates
Associate Curator of Birds, Field Museum of Natural History, Chicago, USA.

Dr K. S. Bostwick
Curator of Birds and Mammals, Cornell University Museum of Vertebrates, and Research Associate, Department of Ecology and Evolutionary Biology, Cornell University, New York, USA.

Dr M. de L. Brooke
Strickland Curator of Ornithology, University Museum of Zoology, Cambridge, England.

I. C. Caballero
Graduate student, Division of Birds, Field Museum of Natural History and Department of Biological Sciences, University of Illinois, Chicago, USA.

B. M. Clock
Assistant Curator of Visual Media, Macaulay Library, Cornell Laboratory of Ornithology, Cornell University, New York, USA.

A. Danks
Regional Leader Nature Conservation, Department of Conservation and Land Management, Albany, Western Australia.

Dr P. F. Donald
Senior Research Biologist, Royal Society for the Protection of Birds, Sandy, England.

A. Farnsworth
Graduate Research Assistant, Department of Ecology and Evolutionary Biology, Cornell Laboratory of Ornithology, Cornell University, New York, USA.

Dr J. W. Fitzpatrick
Director, Cornell Laboratory of Ornithology, Cornell University, New York, USA.

Dr B. J. Gill
Auckland War Memorial Museum, Auckland, New Zealand.

P. A. Hosner
Research Assistant, Cornell Laboratory of Ornithology, Cornell University, New York, USA.

Dr L. Joseph
Chair, Department of Ornithology, Academy of Natural Sciences, Philadelphia, Pennsylvania, USA.

Dr E. de Juana
Departamento de Zoología y Antropología Física, Universidad Complutense de Madrid, Spain.

Dr G. M. Langham
Graduate Research Assistant, Cornell Laboratory of Ornithology; Post-doctoral Fellow, James Cook University, Queensland, Australia, and University of California, Berkeley, California, USA; and President, Neotropical Grassland Conservancy.

D. J. Lebbin
Graduate Research Assistant, Department of Ecology and Evolutionary Biology, Cornell Laboratory of Ornithology, Cornell University, New York, USA.

Dr A. Lill
Associate Professor, Monash University, Victoria, Australia.

Dr J. A. Mobley
Research Associate, Cornell Laboratory of Ornithology, Cornell University, New York, USA.

M. B. Robbins
Ornithology Division, University of Kansas Natural History Museum, Lawrence, Kansas, USA.

Dr P. G. Ryan
Percy FitzPatrick Institute of African Ornithology, University of Cape Town, South Africa.

E. Scholes III
Visiting Fellow, Cornell University Museum of Vertebrates, Cornell University, New York, USA.

Dr D. W. Snow
British Museum (Natural History), Tring, Hertfordshire, England.

Dr F. Suárez
Departamento de Ecología, Universidad Autónoma de Madrid, Spain.

J. G. Tello
Graduate Student, Division of Birds, Field Museum of Natural History and Department of Biological Sciences, University of Illinois, Chicago, USA.

Dr A. K. Turner
School of Biology, University of Nottingham, Nottingham, England.

Dr S. J. Tyler
Ornithological Consultant; and Council member of BirdLife Botswana.

Dr B. A. Walther
Post-doctoral researcher, Zoological Museum, University of Copenhagen, Denmark.

Dr K. J. Zimmer
Research Associate, Los Angeles County Museum of Natural History, USA.

Editorial Council

Ramón Mascort
(President)

Josep del Hoyo
Ramón Mascort Brugarolas
Carmen Pascual
Pilar Ruiz-Olalla
Jordi Sargatal

Assistant Editor
Teresa Pardo

Assistant to Editors
Amy Chernasky

Artwork Co-ordinator
Francesc Jutglar

Photo Captions
Joe Tobias *Phil Benstead*

Correction of Texts
Alan Elliott *Heather Elliott* *Clive Mann*

Documentation
José Luis Copete *Marta Fenollar*

Lorena Cascant *Maria Brichs*

Design
Josep del Hoyo *Xavier Ruiz*

Production
Xavier Ruiz

Production Assistants
Laia Olivares *Montserrat Silva*

Administration
Yolanda Aguayo *Pilar Ruiz-Olalla*
Elisa Badia *Francesc Capdevila*
Conchi García *Olga González*
Núria Guevara *Ana Lineros*
Gema López *Silvia López*
Andy Raven *Marta Canal*

Authors for Species Accounts of Tyrannidae

(All species accounts edited by J. W. Fitzpatrick.)

Numbers correspond to numbers of species accounts.

JMB - J. M. Bates
KSB - K. S. Bostwick
ICC - I. C. Caballero
BMC - B. M. Clock
AF - A. Farnsworth
JWF - J. W. Fitzpatrick
PAH - P. A. Hosner
LJ - L. Joseph
GML - G. M. Langham
DJL - D. J. Lebbin
JAM - J. A. Mobley
MBR - M. B. Robbins
ES - E. Scholes
JGT - J. G. Tello
BAW - B. A. Walther
KJZ - K. J. Zimmer

1 *JWF*; 2 *JWF*; 3 *JWF*; 4 *JWF*; 5 *JWF*; 6 *JWF*; 7 *JWF*; 8 *JWF*; 9 *JWF*; 10 *JWF*; 11 *JWF*; 12 *JWF*; 13 *JWF*; 14 *JWF*; 15 *JWF*; 16 *JWF*; 17 *JWF*; 18 *JWF*; 19 *JWF*; 20 *JWF*; 21 *PAH*; 22 *PAH*; 23 *PAH*; 24 *PAH*; 25 *PAH*; 26 *PAH*; 27 *PAH*; 28 *PAH*; 29 *PAH*; 30 *PAH*; 31 *PAH*; 32 *PAH*; 33 *PAH*; 34 *PAH*; 35 *PAH*; 36 *PAH*; 37 *PAH*; 38 *PAH*; 39 *JWF*; 40 *JWF*; 41 *JWF*; 42 *JWF*; 43 *JWF*; 44 *MBR*; 45 *MBR*; 46 *JWF*; 47 *JWF*; 48 *JWF*; 49 *JWF*; 50 *JWF*; 51 *JWF*; 52 *JWF*; 53 *JWF*; 54 *JWF*; 55 *JWF*; 56 *JWF*; 57 *JWF*; 58 *JWF*; 59 *JWF*; 60 *JWF*; 61 *JWF*; 62 *JWF*; 63 *JWF*; 64 *JWF*; 65 *JWF*; 66 *JWF*; 67 *JWF*; 68 *JWF*; 69 *JWF*; 70 *JWF*; 71 *KSB*; 72 *KSB*; 73 *KSB*; 74 *KSB*; 75 *JWF*; 76 *JWF*; 77 *JWF*; 78 *JWF*; 79 *JWF*; 80 *JWF*; 81 *JWF*; 82 *JWF*; 83 *JWF*; 84 *JWF*; 85 *JWF*; 86 *JWF*; 87 *JWF*; 88 *JWF*; 89 *JWF*; 90 *JWF*; 91 *JWF*; 92 *JWF*; 93 *JWF*; 94 *JWF*; 95 *JWF*; 96 *JWF*; 97 *JWF*; 98 *JWF*; 99 *JWF*; 100 *JWF*; 101 *JWF*; 102 *JWF*; 103 *JWF*; 104 *JWF*; 105 *JWF*; 106 *JWF*; 107 *JWF*; 108 *JWF*; 109 *JWF*; 110 *JWF*; 111 *JWF*; 112 *JWF*; 113 *JWF*; 114 *JWF*; 115 *JWF*; 116 *JWF*; 117 *JWF*; 118 *JWF*; 119 *JWF*; 120 *JWF*; 121 *JWF*; 122 *JWF*; 123 *JWF*; 124 *JWF*; 125 *MBR*; 126 *MBR*; 127 *MBR*; 128 *JWF*; 129 *JWF*; 130 *JWF*; 131 *JWF*; 132 *BMC*; 133 *BMC*; 134 *BMC*; 135 *BMC*; 136 *BMC*; 137 *BMC*; 138 *BMC*; 139 *BMC*; 140 *BMC*; 141 *BMC*; 142 *BMC*; 143 *BMC*; 144 *BMC*; 145 *BMC*; 146 *BMC*; 147 *BMC*; 148 *BMC*; 149 *BMC*; 150 *BMC*; 151 *BMC*; 152 *BMC*; 153 *BMC*; 154 *BMC*; 155 *BMC*; 156 *BMC*; 157 *BMC*; 158 *BMC*; 159 *BMC*; 160 *BMC*; 161 *BMC*; 162 *BMC*; 163 *BMC*; 164 *BMC*; 165 *BMC*; 166 *KJZ*; 167 *BAW*; 168 *BAW*; 169 *BAW*; 170 *BAW*; 171 *BAW*; 172 *BAW*; 173 *BAW*; 174 *BAW*; 175 *BAW*; 176 *BAW*; 177 *BAW*; 178 *BAW*; 179 *BAW*; 180 *BAW*; 181 *BAW*; 182 *BAW*; 183 *BAW*; 184 *BAW*; 185 *BAW*; 186 *JMB*; 187 *JMB*; 188 *JMB*; 189 *JMB*; 190 *ICC*; 191 *ICC*; 192 *ICC*; 193 *ICC*; 194 *ICC*; 195 *JGT*; 196 *JGT*; 197 *JGT*; 198 *JGT*; 199 *JGT*; 200 *JGT*; 201 *JGT* ; 202 *AF & DJL*; 203 *AF & DJL*; 204 *AF & DJL*; 205 *AF & DJL*; 206 *AF & DJL*; 207 *AF & DJL*; 208 *AF & DJL*; 209 *AF & DJL*; 210 *AF & DJL*; 211 *AF & DJL*; 212 *AF & DJL*; 213 *AF & DJL*; 214 *AF & DJL*; 215 *AF & DJL*; 216 *AF & DJL*; 217 *AF & DJL*; 218 *AF & DJL*; 219 *AF & DJL*; 220 *AF & DJL*; 221 *AF & DJL*; 222 *AF & DJL*; 223 *AF & DJL*; 224 *AF & DJL*; 225 *AF & DJL*; 226 *AF & DJL*; 227 *AF & DJL*; 228 *AF & DJL*; 229 *AF & DJL*; 230 *AF & DJL*; 231 *AF & DJL*; 232 *AF & DJL*; 233 *AF & DJL*; 234 *AF & DJL*; 235 *AF & DJL*; 236 *AF & DJL*; 237 *AF & DJL*; 238 *AF & DJL*; 239 *AF & DJL*; 240 *AF & DJL*; 241 *AF & DJL*; 242 *AF & DJL*; 243 *AF & DJL*; 244 *AF & DJL*; 245 *AF & DJL*; 246 *AF & DJL*; 247 *AF & DJL*; 248 *AF & DJL*; 249 *AF & DJL*; 250 *AF & DJL*; 251 *AF & DJL*; 252 *AF & DJL*; 253 *AF & DJL*; 254 *AF & DJL*; 255 *AF & DJL*; 256 *AF & DJL*; 257 *AF & DJL*; 258 *AF & DJL*; 259 *AF & DJL*; 260 *AF & DJL*; 261 *AF & DJL*; 262 *AF & DJL*; 263 *AF & DJL*; 264 *AF & DJL*; 265 *AF & DJL*; 266 *AF & GML*; 267 *AF & GML*; 268 *AF & GML*; 269 *AF & GML*; 270 *AF & GML*; 271 *AF & GML*; 272 *AF & GML*; 273 *AF & GML*; 274 *AF & GML*; 275 *AF & GML*; 276 *AF & GML*; 277 *AF & GML*; 278 *AF & GML*; 279 *AF & GML*; 280 *AF & GML*; 281 *AF & GML*; 282 *AF & GML*; 283 *AF & GML*; 284 *AF & GML*; 285 *AF & GML*; 286 *AF & GML*; 287 *AF & GML*; 288 *AF & GML*; 289 *AF & GML*; 290 *AF & GML* ; 291 *AF & GML*; 292 *AF & GML*; 293 *AF & GML*; 294 *AF & GML*; 295 *AF & GML*; 296 *AF & GML* ; 297 *AF & GML*; 298 *AF & GML*; 299 *AF & GML*; 300 *AF & GML*; 301 *AF & GML*; 302 *AF & GML*; 303 *AF & GML*; 304 *AF & GML*; 305 *AF & GML*; 306 *AF & GML*; 307 *AF & GML*; 308 *AF & GML*; 309 *AF & GML*; 310 *AF & GML*; 311 *AF & GML*; 312 *AF & GML*; 313 *AF & GML*; 314 *AF & GML*; 315 *AF & GML*; 316 *AF & GML*; 317 *AF & GML*; 318 *AF & GML*; 319 *AF & GML*; 320 *AF & GML*; 321 *AF & GML*; 322 *AF & GML*; 323 *AF & GML*; 324 *AF & GML*; 325 *AF & GML*; 326 *AF & GML*; 327 *AF & GML*; 328 *AF & GML*; 329 *AF & GML*; 330 *AF & GML*; 331 *JAM*; 332 *JWF*; 333 *JAM*; 334 *JAM*; 335 *JAM*; 336 *JAM*; 337 *JAM*; 338 *JAM*; 339 *JAM*; 340 *JAM*; 341 *JAM*; 342 *JAM*; 343 *JAM*; 344 *JAM*; 345 *JAM*; 346 *JAM*; 347 *JAM*; 348 *JAM*; 349 *JAM*; 350 *JAM*; 351 *JAM*; 352 *JAM*; 353 *JAM*; 354 *JAM*; 355 *JAM*; 356 *JAM*; 357 *JAM*; 358 *JAM*; 359 *JAM*; 360 *JAM*; 361 *JAM*; 362 *JAM*; 363 *JAM*; 364 *JAM*; 365 *JAM*; 366 *JAM*; 367 *JAM*; 368 *ES*; 369 *ES*; 370 *ES*; 371 *ES*; 372 *ES*; 373 *ES*; 374 *LJ*; 375 *LJ*; 376 *LJ*; 377 *LJ*; 378 *LJ*; 379 *LJ*; 380 *LJ*; 381 *LJ*; 382 *LJ*; 383 *LJ*; 384 *LJ*; 385 *LJ*; 386 *LJ*; 387 *LJ*; 388 *LJ*; 389 *LJ*; 390 *LJ*; 391 *LJ*; 392 *LJ*; 393 *LJ*; 394 *LJ*; 395 *LJ*; 396 *LJ*; 397 *BAW*; 398 *BAW*; 399 *BAW*; 400 *BAW*; 401 *BAW*; 402 *BAW*; 403 *BAW*; 404 *BAW*; 405 *BAW*; 406 *BAW*; 407 *BAW*; 408 *BAW*; 409 *JAM*; 410 *JAM*; 411 *JAM*; 412 *JAM*; 413 *JAM*; 414 *JAM*; 415 *JAM*; 416 *JAM*; 417 *JAM*; 418 *JAM*; 419 *JAM*; 420 *JAM*; 421 *JAM*; 422 *JAM*; 423 *JAM*; 424 *JAM*; 425 *JAM*; 426 *JAM*; 427 *JAM*; 428 *JAM*; 429 *JAM*.

Authors for Species Accounts of Alaudidae

Numbers correspond to numbers of species accounts.

PA - P. Alström
PFD - P. F. Donald
EJ - E. de Juana
PGR - P. G. Ryan
FS - F. Suárez

1 *PA*; 2 *PA*; 3 *PA*; 4 *PA*; 5 *PA*; 6 *PA*; 7 *PGR*; 8 *PGR*; 9 *PGR*; 10 *PGR*; 11 *PGR*; 12 *PGR*; 13 *PGR*; 14 *PGR*; 15 *PGR*; 16 *PGR*; 17 *PGR*; 18 *PGR*; 19 *PGR*; 20 *PGR*; 21 *PGR*; 22 *PGR*; 23 *PGR*; 24 *PGR*; 25 *PGR*; 26 *PGR*; 27 *PGR*; 28 *PGR*; 29 *PGR*; 30 *PGR*; 31 *PGR*; 32 *PGR*; 33 *PGR*; 34 *PGR*; 35 *PGR*; 36 *PGR*; 37 *PGR*; 38 *PGR*; 39 *PGR*; 40 *PGR*; 41 *PGR*; 42 *PGR*; 43 *PGR*; 44 *PGR*; 45 *PGR*; 46 *PGR*; 47 *PGR*; 48 *PGR*; 49 *EJ & FS*; 50 *PGR*; 51 *EJ & FS*; 52 *PGR*; 53 *PGR*; 54 *PGR*; 55 *PGR*; 56 *PGR*; 57 *PGR*; 58 *PA*; 59 *EJ & FS*; 60 *PA*; 61 *EJ & FS*; 62 *EJ & FS*; 63 *EJ & FS*; 64 *PA*; 65 *PA*; 66 *PA*; 67 *PA*; 68 *PA*; 69 *EJ & FS*; 70 *PGR*; 71 *PGR*; 72 *PGR*; 73 *PA*; 74 *PGR*; 75 *EJ & FS*; 76 *PA*; 77 *PFD*; 78 *EJ & FS*; 79 *EJ & FS*; 80 *PGR*; 81 *PGR*; 82 *PGR*; 83 *PGR*; 84 *PGR*; 85 *PGR*; 86 *PGR*; 87 *EJ & FS*; 88 *EJ & FS*; 89 *PA*; 90 *PGR*; 91 *PA*; 92 *PGR*; 93 *PFD*; 94 *PA*; 95 *PFD*; 96 *PFD*.

CONTENTS

Foreword ..... *R. C. Banks* 13

Introduction 27

Order PASSERIFORMES

Family COTINGIDAE (COTINGAS) ..... *D. W. Snow* 32

Species accounts of Cotingidae

M. de L. Brooke (*Oxyruncus*), *B. A. Walther* (*Phytotoma*)
& D. W. Snow (all other genera)

Family PIPRIDAE (MANAKINS) ..... *D. W. Snow* 110

Family TYRANNIDAE (TYRANT-FLYCATCHERS) ..... *J. W. Fitzpatrick* 170

Species accounts of Tyrannidae
(for specific contributions, see facing page):

J. W. Fitzpatrick, J. M. Bates, K. S. Bostwick,
I. C. Caballero, B. M. Clock, A. Farnsworth,
P. A. Hosner, L. Joseph, G. M. Langham, D. J. Lebbin,
J. A. Mobley, M. B. Robbins, E. Scholes, J. G. Tello,
B. A. Walther & K. J. Zimmer

Family ACANTHISITTIDAE (NEW ZEALAND WRENS) ..... *B. J. Gill* 464

Family ATRICHORNITHIDAE (SCRUB-BIRDS) ..... *A. Danks* 474

Family MENURIDAE (LYREBIRDS) ..... *A. Lill* 484

Family ALAUDIDAE (LARKS) ..... *E. de Juana, F. Suárez & P. G. Ryan* 496

Species accounts of Alaudidae
(for specific contributions, see facing page):

P. G. Ryan, E. de Juana, F. Suárez,
P. Alström & P. F. Donald

Family HIRUNDINIDAE (SWALLOWS AND MARTINS) ..... *A. K. Turner* 602

Family MOTACILLIDAE (PIPITS AND WAGTAILS) ..... *S. J. Tyler* 686

REFERENCES

References of Scientific Descriptions 788

General List of References 796

INDEX 847

LIST OF PLATES

Plate 1	COTINGIDAE I (*Oxyruncus, Phytotoma, Ampelion, Doliornis, Zaratornis, Laniisoma*)	*C. Rose*	72
Plate 2	COTINGIDAE II (*Phibalura, Carpornis, Pipreola*)	*C. Rose*	78
Plate 3	COTINGIDAE III (*Pipreola, Ampelioides*)	*C. Rose*	82
Plate 4	COTINGIDAE IV (*Iodopleura, Calyptura, Snowornis, Lipaugus, Tijuca*)	*C. Rose*	86
Plate 5	COTINGIDAE V (*Porphyrolaema, Cotinga*)	*C. Rose*	92
Plate 6	COTINGIDAE VI (*Xipholena, Carpodectes, Conioptilon, Gymnoderus*)	*C. Rose*	96
Plate 7	COTINGIDAE VII (*Haematoderus, Querula, Pyroderus, Cephalopterus, Perissocephalus*)	*C. Rose*	100
Plate 8	COTINGIDAE VIII (*Procnias*)	*C. Rose*	104
Plate 9	COTINGIDAE IX (*Phoenicircus, Rupicola*)	*C. Rose*	106
Plate 10	PIPRIDAE I (*Pipra*)	*J. Wilczur*	142
Plate 11	PIPRIDAE II (*Lepidothrix*)	*J. Wilczur*	146
Plate 12	PIPRIDAE III (*Dixiphia, Antilophia, Chiroxiphia, Ilicura*)	*J. Wilczur*	150
Plate 13	PIPRIDAE IV (*Masius, Corapipo, Manacus*)	*J. Wilczur*	154
Plate 14	PIPRIDAE V (*Machaeropterus, Xenopipo, Chloropipo, Heterocercus*)	*J. Wilczur*	158
Plate 15	PIPRIDAE VI (*Neopelma, Tyranneutes, Piprites, Sapayoa, Schiffornis*)	*J. Wilczur*	164
Plate 16	TYRANNIDAE I (*Phyllomyias, Tyrannulus*)	*I. Willis*	258
Plate 17	TYRANNIDAE II (*Myiopagis, Elaenia*)	*I. Willis*	264
Plate 18	TYRANNIDAE III (*Elaenia, Ornithion, Camptostoma, Suiriri*)	*I. Willis*	270
Plate 19	TYRANNIDAE IV (*Mecocerculus, Anairetes*)	*B. Small*	278
Plate 20	TYRANNIDAE V (*Serpophaga, Phaeomyias, Nesotriccus, Capsiempis, Culicivora, Polystictus, Pseudocolopteryx, Pseudotriccus*)	*B. Small*	284
Plate 21	TYRANNIDAE VI (*Corythopis, Euscarthmus, Pseudelaenia, Stigmatura, Zimmerius*)	*B. Small*	292
Plate 22	TYRANNIDAE VII (*Phylloscartes, Pogonotriccus*)	*B. Small*	298
Plate 23	TYRANNIDAE VIII (*Leptopogon, Mionectes, Sublegatus, Inezia*)	*B. Small*	306
Plate 24	TYRANNIDAE IX (*Myiotriccus, Tachuris, Myiornis, Oncostoma, Lophotriccus, Atalotriccus*)	*H. Burn*	314
Plate 25	TYRANNIDAE X (*Hemitriccus*)	*H. Burn*	320
Plate 26	TYRANNIDAE XI (*Hemitriccus, Taeniotriccus, Poecilotriccus*)	*H. Burn*	326
Plate 27	TYRANNIDAE XII (*Poecilotriccus, Todirostrum*)	*H. Burn*	332
Plate 28	TYRANNIDAE XIII (*Rhynchocyclus, Tolmomyias, Platyrinchus*)	*N. Arlott*	336
Plate 29	TYRANNIDAE XIV (*Onychorhynchus, Cnipodectes, Myiophobus*)	*H. Burn*	344
Plate 30	TYRANNIDAE XV (*Myiobius, Terenotriccus, Neopipo, Pyrrhomyias, Hirundinea*)	*H. Burn*	350
Plate 31	TYRANNIDAE XVI (*Lathrotriccus, Aphanotriccus, Xenotriccus, Cnemotriccus*)	*H. Burn*	354
Plate 32	TYRANNIDAE XVII (*Empidonax*)	*H. Burn*	358
Plate 33	TYRANNIDAE XVIII (*Contopus, Mitrephanes*)	*N. Arlott*	366
Plate 34	TYRANNIDAE XIX (*Sayornis, Pyrocephalus, Lessonia, Hymenops*)	*H. Burn*	372
Plate 35	TYRANNIDAE XX (*Knipolegus*)	*J. Cox*	376
Plate 36	TYRANNIDAE XXI (*Tumbezia, Ochthoeca, Colorhamphus*)	*J. Cox*	380
Plate 37	TYRANNIDAE XXII (*Ochthornis, Satrapa, Fluvicola, Arundinicola, Alectrurus, Myiotheretes, Cnemarchus, Neoxolmis, Polioxolmis*)	*H. Burn*	386
Plate 38	TYRANNIDAE XXIII (*Xolmis, Agriornis*)	*H. Burn*	392
Plate 39	TYRANNIDAE XXIV (*Muscisaxicola, Gubernetes, Muscipipra*)	*H. Burn*	398
Plate 40	TYRANNIDAE XXV (*Colonia, Muscigralla, Machetornis, Legatus, Myiozetetes, Phelpsia, Pitangus, Philohydor*)	*I. Lewington*	404
Plate 41	TYRANNIDAE XXVI (*Conopias, Myiodynastes, Megarynchus, Tyrannopsis, Empidonomus, Griseotyrannus*)	*I. Lewington*	410
Plate 42	TYRANNIDAE XXVII (*Tyrannus*)	*I. Lewington*	418
Plate 43	TYRANNIDAE XXVIII (*Rhytipterna, Sirystes, Casiornis*)	*H. Burn*	426
Plate 44	TYRANNIDAE XXIX (*Myiarchus*)	*H. Burn*	430

Plate 45	TYRANNIDAE XXX (*Myiarchus*, *Deltarhynchus*)	*H. Burn*	436
Plate 46	TYRANNIDAE XXXI (*Ramphotrigon*, *Attila*, *Laniocera*)	*N. Arlott*	442
Plate 47	TYRANNIDAE XXXII (*Tityra*)	*N. Arlott*	448
Plate 48	TYRANNIDAE XXXIII (*Xenopsaris*, *Pachyramphus*)	*N. Arlott*	452
Plate 49	TYRANNIDAE XXXIV (*Pachyramphus*)	*N. Arlott*	458
Plate 50	ACANTHISITTIDAE (*Acanthisitta*, *Xenicus*)	*B. Small*	472
Plate 51	ATRICHORNITHIDAE (*Atrichornis*)	*B. Small*	482
Plate 52	MENURIDAE (*Menura*)	*B. Small*	494
Plate 53	ALAUDIDAE I (*Mirafra*)	*T. Worfolk*	542
Plate 54	ALAUDIDAE II (*Mirafra*)	*T. Worfolk*	550
Plate 55	ALAUDIDAE III (*Heteromirafra*, *Calendulauda*)	*T. Worfolk*	556
Plate 56	ALAUDIDAE IV (*Pinarocorys*, *Ammomanopsis*, *Chersomanes*, *Certhilauda*, *Alaemon*, *Chersophilus*)	*T. Worfolk*	562
Plate 57	ALAUDIDAE V (*Eremopterix*)	*T. Worfolk*	570
Plate 58	ALAUDIDAE VI (*Ammomanes*, *Ramphocoris*, *Melanocorypha*)	*T. Worfolk*	576
Plate 59	ALAUDIDAE VII (*Calandrella*)	*T. Worfolk*	582
Plate 60	ALAUDIDAE VIII (*Eremophila*, *Eremalauda*, *Spizocorys*, *Pseudalaemon*)	*T. Worfolk*	588
Plate 61	ALAUDIDAE IX (*Galerida*, *Alauda*, *Lullula*)	*T. Worfolk*	594
Plate 62	HIRUNDINIDAE I (*Pseudochelidon*)	*H. Burn*	641
Plate 63	HIRUNDINIDAE II (*Psalidoprocne*, *Pseudhirundo*, *Cheramoeca*, *Phedina*)	*H. Burn*	642
Plate 64	HIRUNDINIDAE III (*Riparia*, *Tachycineta*)	*H. Burn*	646
Plate 65	HIRUNDINIDAE IV (*Progne*)	*H. Burn*	654
Plate 66	HIRUNDINIDAE V (*Notiochelidon*, *Haplochelidon*, *Atticora*, *Neochelidon*, *Stelgidopteryx*, *Alopochelidon*)	*H. Burn*	658
Plate 67	HIRUNDINIDAE VI (*Hirundo*)	*H. Burn*	664
Plate 68	HIRUNDINIDAE VII (*Ptyonoprogne*, *Delichon*, *Cecropis*)	*H. Burn*	672
Plate 69	HIRUNDINIDAE VIII (*Petrochelidon*)	*H. Burn*	680
Plate 70	MOTACILLIDAE I (*Anthus*)	*R. Hathway*	744
Plate 71	MOTACILLIDAE II (*Anthus*)	*R. Hathway*	748
Plate 72	MOTACILLIDAE III (*Anthus*)	*R. Hathway*	752
Plate 73	MOTACILLIDAE IV (*Anthus*)	*R. Hathway*	758
Plate 74	MOTACILLIDAE V (*Anthus*)	*R. Hathway*	762
Plate 75	MOTACILLIDAE VI (*Tmetothylacus*, *Hemimacronyx*, *Macronyx*)	*R. Hathway*	770
Plate 76	MOTACILLIDAE VII (*Dendronanthus*, *Motacilla*)	*R. Hathway*	776
Plate 77	MOTACILLIDAE VIII (*Motacilla*)	*R. Hathway*	780
Plate 78	MOTACILLIDAE IX (*Motacilla*)	*R. Hathway*	784

Foreword

Ornithological Nomenclature

Ornithological nomenclature is a branch of zoological nomenclature, and is thus "the system of scientific names applied to taxonomic units ... of extant or extinct" birds (International Commission on Zoological Nomenclature [ICZN] 1999: Art. 1.1). The words "nomenclature" and "taxonomy" are often used interchangeably, but if nomenclature is taken as the application and use of scientific names, taxonomy is the study of populations to determine which of them are sufficiently distinct to merit scientific names. Systematics, then, may be considered the study of the relationships between, and classification of, those named taxonomic units. It is impossible to discuss nomenclature without also discussing taxonomy, and it is nearly if not actually impossible to write more than a few sentences without using the words in different and overlapping ways. Nomenclature is the result of taxonomic decisions or actions.

Writing an essay on a subject that has been around as long as nomenclature is not as easy as one might think. In reviewing literature to develop ideas that I wanted to write about, I found that nearly everything I considered discussing has already been said, much better than I could possible hope to write it. For example, the development of the International Code of Zoological Nomenclature (hereafter, the Code) and of the earlier American Ornithologists' Union [AOU] Code dedicated to avian nomenclature are well and extensively chronicled in introductions to those documents (ICZN 1961, 1985, AOU 1886). Further, Bock (1994) has given a detailed history of nomenclature, emphasizing the family-group level. Melville (1995) has traced the history of the Commission. My only hope for a semblance of originality is that many readers of this Handbook will not have ready access to, or will not have found the time to read, that historical information. Here I can hope only to summarize, and to avoid plagiarizing, those important documents. If there is anything of interest in this discussion of the development of rules for avian nomenclature, I recommend that you delve into the sources just cited.

Beginnings of Ornithological Nomenclature

There is no record of when members of some early population of mankind first agreed that a particular sound that they each made would invoke the concept of some particular kind of bird and distinguish it from other kinds of birds. It might have been to designate a scavenger that competed with them for the remains of carcasses, or the imitation of a nocturnal sound associated with a form occasionally seen flitting across the moonlit sky. When all those in the community used the same sound — a grunt, or syllable, or "word" — for the same avian concept, avian nomenclature had begun. And when members of two communities met and realized that they used different sounds for the same bird, or the same sound for different birds, problems in avian nomenclature had begun. These primitive designations eventually developed into what are now called Common or Vernacular names, of which there can be one or more sets for each human language. There are still differences, and to some extent problems, between and even within languages, despite efforts to standardize names (e.g., Eisenmann & Poor 1946, Smith 1992; see entries under "Name" in Campbell & Lack 1985).

Early technical nomenclature fared no better as it developed from vernacular nomenclature. Some vernacular names from Latin and Greek, in particular, became the basis for scientific names because writings by the early philosophers and scientists

who used those languages have persisted. The first modern naturalists are generally perceived to have been scholars, educated in the Latin and Greek languages as a matter of course, using Latin as the primary language of science. Man's nature is to group things, and the early writers whom we might consider the first scientists grouped objects, including kinds of birds, that seemed to share characteristics. Thus many Latin vernacular names came to be used as group names, now considered generic names. Each of the great early naturalists used meaningful group names and specified kinds within the group by a series of descriptive or geographical modifiers. Many — probably most — species of birds, as well as other organisms, received more than one such "scientific" name, usually (but not always) bestowed by different workers studying different material at different times and places.

Linnaeus is credited with having originated the binomial system of nomenclature used today in all phyla of biological life. In this system, the scientific name of a species of organism is composed of two parts. The first word is the name of a genus, with a capital initial letter. The second word is the species name, written entirely in lower case letters; Recommendation 28A of the Code urges authors not to use a species-group name as the first word of a sentence, in order to avoid having to capitalize the initial letter. All names at the generic rank or lower are printed in italics to set them apart from other text. Linnaeus began using generic names in botany as early as his *Genera Plantarum* in 1737, and some zoologists were also using generic names as early as the 1730s. He promulgated rules for binomial nomenclature in 1751 and further developed the concept with his *Species Plantarum* in 1753. With the 10th edition of *Systema Naturae* in 1758, Linnaeus consistently used binomial nomenclature for all animals, and the practice took root from that moment, though with some notable exceptions (see, e.g., Bruce, HBW 8, pp. 17-20). However, naturalists in the century after the 10th edition often coined their own binomial names for species, with little knowledge of, and perhaps regard for, names set forth by others. There were no consistent rules for uniform application of names. Of course, in today's world of instant worldwide communication, it is often easy to forget the complications and time involved in past times in the spreading of word from one part of the world to another.

Origins of the Code

Ornithologists have had much to do with the formulation of rules embodied in the present code of nomenclature. The British Association for the Advancement of Science appointed a committee to develop some rules to regulate zoological nomenclature. The committee included Charles Darwin, among other notables of the day. Ornithologist (and geologist) Hugh E. Strickland was the "reporter" for the committee, probably the secretary in modern terminology, and probably the primary author of the resulting "Series of Propositions for Rendering the Nomenclature of Zoology Uniform and Permanent." This report was adopted by the British Association in 1842. It was soon adopted also by the American Association for the Advancement of Science and by similar bodies in other nations. Modified in various ways through the decades, the Stricklandian Code, as it became known, was followed "with more or less reservation and evasion by naturalists at large" into the 1880s (AOU 1886: 4).

When the American Ornithologists' Union was founded in 1883, one of the first committees established was that on Classification and Nomenclature. At that time, American ornithologists had their choice of at least four differing lists of American birds, by Spencer Baird from 1858, Robert Ridgway in 1880, and Elliot Coues in 1873 and 1882. The task of the committee (which included both Coues and Ridgway) was to amalgamate these lists into one that would be acceptable to all North American workers. The committee found it necessary first to examine the principles of zoological nomenclature, and the rules and practices of avian nomenclature in particular. This led to the formation of a "Code of Rules" for the guidance of the committee in fixing the name of every North American bird. The "Principles, Canons, and Recommendations" that formed the AOU Code of Nomenclature were published as a preamble to the first Check-list of North American Birds in 1886. Because this code was the first dedicated particularly to avian (rather than all zoological) nomenclature, and because it had an influence on the development of the present International Code of Zoological Nomenclature, we may examine it in some detail.

The AOU Committee took the Stricklandian Code as its point of departure, intending "to reaffirm and reproduce as many of its rules as may be desirable ... and then to build upon such a foundation with those additional recommendations and suggestions which in the judgment of the Committee are required to meet the demands of the present state of zoological science, and which seem most timely in view if its evident tendency, and probable progress in the future." The main departures from the earlier

Stricklandian Code were (1) the adoption of the date of the 10th edition of the *Systema Naturae*, 1758, instead of that of the 12th, 1766, as the starting point for the law of priority and therefore official nomenclature; (2) the rule that prior use of a name in botany does not make that name unavailable in zoology; and (3) adoption of the principle of trinomial nomenclature, providing for the nomenclatural recognition of subspecies. These departures are discussed in some detail below.

Linnaeus (and others) had used binomial nomenclature to some extent in earlier works, but it was not until the 10th edition of *Systema Naturae* in 1758 that the system of a distinctive generic and specific name for each species was used consistently in a single work. In the 12th edition, in 1766, many more species were included and names of some of the species in the 10th were changed. It is said that in the original draft of the Stricklandian Code, the number of the edition of *Systema Naturae* designated as the start of the law of priority, and thus binomial nomenclature, was left blank, and "twelfth" or "XIIth" was filled in by the committee approving the report. Even though it was recognized that binomial nomenclature had begun in earnest with the 10th edition, the 12th was maintained in the rules for many years because changing to the earlier date would require many changes of names and cause much confusion. The AOU committee, however, disagreed with that reasoning and selected the 10th edition. Its reasons were: (1) "the Xth edition is the one in which Linnaeus first introduced the binomial nomenclature, and in which its use is uniform, consistent, and complete;" (2) "This date [1758] admits to recognition the works of Artedi, Scopoli, Clerck, Pallas, Brünnich, Brisson . . . ", who had published important binomial taxonomic works between the 10th and 12th editions of Linnaeus and whose names used by Linnaeus in the 12th would thus be attributed to him rather than to their true authors; (3) the 10th rather than the 12th was in fact accepted as the starting point by a majority of naturalists in North America and Europe; (4) using the date 1758 resolved many questions of synonymy or homonymy which arose because Linnaeus changed in the 12th edition some names he had used in the 10th (Sherborn 1899); (5) the context of the draft of the Stricklandian Code implied that the 10th edition was intended to be the starting point, but that the 12th was inserted arbitrarily when the edition number was left blank; and (6) adoption of the 10th edition required very few changes in nomenclature then in use in most fields of zoology. Recognition of the 10th edition as the starting point was accepted universally when the present International Code was formalized.

The Stricklandian Code related only to zoology, and was silent on any relationship with botanical nomenclature. The restriction to zoological nomenclature was affirmed in various committee decisions in following decades. The AOU Code also related only to zoology, and indeed specified that there was "no necessary connection" between the two nomenclatural systems, and that use of a name in botany did not preclude its use in zoology, or vice versa. This was accompanied, however, by a strong recommendation that zoologists avoid using names already in use in botany.

The AOU Code did not introduce the concept of the subspecies, but it was the "first formally to enunciate the principles of the new method" of trinomial nomenclature for those forms that are known to intergrade in physical characters. The trinomial system was not a replacement for, but an extension of, the binomial system, which was to continue in use for those forms that are not known to intergrade. Trinomial nomenclature consisted of dealing with an organism of a population known to intergrade with another by applying to it three names, "one of which expresses the subspecific distinctness of the organism from all other organisms, and the other two of which express respectively its specific indistinctness from or generic identity with, certain other organisms; the first of these names being the subspecific, the second the specific, and the third the generic designation ..." Adding a third part to the binomial name "amplifies, increases the effective force of, and lends a new precision to, the old system." Most of us today would do well to reflect that the generic name indicates "identity" in certain distinctive characters with other species, the species name indicates "indistinctness" from populations that intergrade or vary clinally, and the subspecific name indicates "distinctness" of a population in morphological characters because of geographic and environmental conditions (AOU 1886: 16, 30-31). This might also be taken as an early formulation of the biological species concept. The third name used was, under the AOU Code, to be formed in the same way as, and subject to the same rules as, the specific name, as is the practice today when the two names are treated together as "species-group" names in the International Code of Zoological Nomenclature. The latter Code recognizes that the use of a name at the species or subspecies level reflects a taxonomic decision, and does not consider the use of a trinomial as a deviation from binomial nomenclature.

One may see other forms of a scientific name that appear to differ from the binomial form. The name of a subgenus (with a capital initial letter) may be interpolated, in parentheses, between the generic and specific names; it is not counted as part of the

binomen (Code, Article 6). Amadon (1966, 1968) introduced the concept of a superspecies, consisting of closely related but geographically separate allospecies. The name of the superspecies (the senior of the allospecies names) would be placed in square brackets before the name of the species. This system has been adopted by Sibley and Monroe (1990), among others. Similarly, Amadon and Short (1976) advocated the designation of megasubspecies, to be indicated (where used) by a species-group name interpolated in parentheses before a species name, to set apart a group of subspecies sometimes or potentially recognized as the species level. This burden on the concept of a binomial name has not come into general use, although it survives in the "group" names used by Sibley and Monroe (1990) and the AOU (1983, 1998). These interpolated names, when used, relate to classification rather than nomenclature, and are not counted as part of the binomial or trinomial name.

In addition to the Stricklandian and AOU Codes, national codes were adopted in France and Germany in the late nineteenth century. With the convening of the first International Congress of Zoology in 1889, a set of rules was proposed, but not adopted, for international use. A set of French rules was adopted at the second Congress (1892), and at the third Congress (1895) an international commission was appointed to study all existing rules and to develop a truly international code (see Melville 1995). At the fifth Congress in 1901, parts of that commission's report were accepted, and that action is regarded as the adoption of a code, published in 1905 as the *Règles internationales de la Nomenclature zoologique* in French, with English and German translations. The *Règles* have been modified and amended throughout the century, but in essence they are still in effect today as the International Code of Zoological Nomenclature, now in its fourth edition. The full history of the present Code has been set forth in greater detail in the prefaces and introductions to the various editions of the Code (ICZN 1961, 1985, 1999) and by Bock (1994). The Commission continued under the auspices of the International Congresses of Zoology until they ceased in 1972, when authority for it was transferred to the International Union of Biological Sciences (Melville 1995).

The International Trust for Zoological Nomenclature was established in 1947 to handle the finances of the Commission. The Trust is a registered charity under United Kingdom law and thus is free of taxes on income, including that from sales of publications such as the Code (Melville 1995). The Trust still is largely dependent on contributions. It exists to manage funds in support of the Commission, and serves as its publishing arm. It publishes the quarterly *Bulletin of Zoological Nomenclature* and the *Official Lists and Indexes of Names in Zoology* as well as the Code. At the time of writing, the Trust has announced a plan to raise a significant endowment to ensure its continued ability to support the work of the Commission.

Applying the Code: Rules and Categories

The Code is based on several principles, some of which follow almost precisely those listed by the AOU in 1886. The Code does not infringe on an individual's taxonomic judgement. Nomenclature does not determine the rank given to any assemblage of animals, but rather, through the process of typification, provides the name to be used for a taxon at whatever limits or rank are given to it. Every name covered by the Code is permanently attached to a name-bearing type. For species and subspecies, the type is a single specimen (preferably) or a particular set of specimens. For genera and subgenera the type is a species, and for families the type is a genus. The Code does not apply to groupings above the family level. The Principle of Priority determines (with some exceptions) what name is valid in any rank in which a population or assemblage is assigned by the individual taxonomist or systematist. Such an assemblage can have only one valid name, and the same name cannot be used for more than one taxon.

The goal of the Code is to promote stability in nomenclature; the primary way this is accomplished is by the Principle of Priority. The first name properly applied to a taxon remains the correct name for that taxon. The beginning date for purposes of priority is 1 January 1758, deemed to be the date of publication of the tenth edition of Linnaeus's *Systema Naturae*. For this reason, Linnaeus is credited with naming more currently recognized (by Sibley and Monroe 1990) species of birds than anyone else — about 710 (A. P. Peterson, pers. comm.). To be "available", a name must be properly formed and published in accord with criteria set forth in the Code (Art. 10). New names proposed after 1999 must be explicitly indicated as being new (Art. 16). This new provision is intended to prevent the accidental naming of a form, as has happened in the past at times when a name and sufficient diagnostic information has been published in a newspaper or other news item about a discovery of a new species.

Names at the family-, genus-, and species-group level are based on types. Family-group names are composed of the stem (or root) of the name of the type genus with a

suffix appropriate to the level of the name— -oidea for a superfamily, -idae for a family, -inae for a subfamily, -ini for a tribe, and -ina for a subtribe (Art. 29.2). A family-group name can be used at any, or all, of these levels, but not all levels need to be used in any classification. If two or more genera, each being the type genus of a family name, are combined into a single family, the earliest name at the family-group level has priority and cannot be replaced by a later-proposed family-group name. Bock (1994) has provided a detailed analysis of family-group names in birds, including a few exceptions to the law of priority at that level.

The type of a genus (or subgenus) is a species, but the name of the genus is not based on the name of the type species. In most of the recently named genera, the type species was designated when the genus was named. In many early works (e.g. Linnaeus), generic names were used without a type species being indicated, as the concept of types for genera was not introduced until the Stricklandian Code appeared. If a genus was established for a single species, that species is the type by monotypy. To be sure of stability of generic names, type species for other genera were established by subsequent designation, many of those in birds being proposed by G. R. Gray (1840, 1855). In instances where the name of an included species was used also in a generic sense (often by Brisson), that species became the type species by tautonomy. This becomes rather more complicated in the case of "Linnaean tautonymy": when a new genus is first introduced, if one of the species originally included in it has as one of its listed synonyms a pre-1758 single-word name that is identical to the name of the new genus, it becomes the type species. For example, among the eleven species in Linnaeus's (1758) genus *Strix* was one he named *stridula*. His reference base for that species was a pre-binomial, seventeenth-century use of the name "Strix" by Aldrovandus, where the single word was used to denote a particular species. Thus, *stridula* is the type species of *Strix* by tautonomy, although it is now considered to be a synonym of *Strix aluco*. If two authors name genera with the same type species, the later-named genus is a junior objective synonym. If two authors name genera with different type species that are later considered to be congeneric, the later name is a junior subjective synonym of the first that might be used at a subgeneric level or again at the generic level if the two species are again determined to be distinct at that level. Thus, the level of a genus-group name depends on the individual ornithologist's classification of the type species. Although a few species of birds distinctive enough to warrant separate generic status may yet be discovered, and new genera might be erected for species already known but in the future considered to warrant generic separation, for instance on biochemical grounds, it is reasonably safe to say that generic names in birds are now well established, although the number to be recognized will continue to fluctuate as the relationships of species are re-evaluated. Charles Sibley once told me that there are more names of genera available for hummingbirds than there are species in that family.

The type of a species-group name is an individual bird (holotype) or a series of individuals (syntypes). For species-group names proposed after 1999, a holotype or a series of syntypes must be designated and, if preserved specimens, the name of the collection where the specimens are or will be deposited must be given (Article 16). As the name-bearing specimen, the type defines the species (or subspecies). Non-taxonomists may tend to think that the type specimen is a "typical" member of the species, but no individual can really be typical in all respects. A species is composed of individuals of both sexes and of several age groups that represent the entire range of variation in the species in size, proportions, color, vocalizations, and behavior. No holotype can demonstrate all this variation; it is doubtful that a type series can do so. Still, a type specimen should be easily recognizable as a member of the species for which the name stands.

If a name is based on a series of specimens, with no one designated as the holotype (Articles 72, 73), all members of the series are syntypes. If one individual is designated as holotype, the others in the series are paratypes. It sometimes happens that a type series is composed of members of more than one species or subspecies. If an individual has been designated as a holotype, that specimen is the standard of the name. If there is no holotype and the identity of the taxon is in doubt, one of the syntypes may be designated a lectotype; it serves the name-bearing function of the holotype. The other syntypes then become paralectotypes. If no name-bearing type or member of the original type series is believed to be extant, and it is necessary to fix the identity of a taxon, a neotype may be designated. Designation of a lectotype or neotype is seldom necessary in ornithology, and these actions are strictly regulated by the Code (Articles 74, 75).

The type locality of a species is the locality from which the name-bearing specimen(s) originated. If no holotype has been designated, the type locality encompasses the localities of all syntypes. Under certain circumstances, a stated type locality may be modified (restricted) or corrected. For example, many South American birds have Bogotá [Colombia] as the originally designated type locality, but Bogotá was the place from which specimens taken in a large surrounding area were shipped to Europe, not neces-

sarily the precise origin of the specimens (Chapman 1917). If the type locality of a species is general or vague, a student of geographic variation who wishes to name additional subspecies of the species must attempt to make the original type locality more specific or restricted. Linnaeus (1758) based the name of the American Blue Jay, now *Cyanocitta cristata,* on a painting by Mark Catesby, giving the locality only as "America septentrionali," or northern America. That locality was restricted to "Carolina" (AOU 1910) and further restricted to "southeastern South Carolina" by Oberholser (1921) when he named the more northern birds *Cyanocitta c. bromia.*

Historically, many species of birds were first named on the basis of illustrations. Linnaeus (1758) named many species on the basis of paintings by Catesby, Edwards, and others. Although the painting (or other illustration) is often spoken of as the type, the actual type is the bird that was illustrated. The identity of the population from which the illustrated bird originated is in most cases known or at least accepted by now, but nomenclatural problems can arise if concepts of geographic variation change. The name of the Black-bellied Whistling-duck, *Dendrocygna autumnalis*, was based by Linnaeus (1758) on a plate and description by Edwards (1751) from the West Indies, possibly Jamaica. Most authors considered the illustrated bird to be representative of the populations in Central and North America, and a second species, *Dendrocygna discolor*, later considered a subspecies of *D. autumnalis*, was described from South America by Sclater and Salvin (1873). Subsequent re-examination of patterns of variation and of distribution led to the realization that Edwards had actually illustrated a bird of the South American form, hitherto known as *discolor*, that had been translocated to Jamaica. As a result, the first species-group name, *autumnalis*, replaced the name *discolor* for South American birds, and a much later name, *fulgens*, had then to be applied to the Central and North American birds (Banks 1978; compare treatments of the species by Peters (1931: 153) and Johnsgard *in* Mayr and Cottrell 1979: 430).

A tendency has developed in recent decades to name species or subspecies of birds without a preserved specimen, basing the name instead on living birds or on photographs (e.g., Welch and Welch 1988). The negative aspects of that practice were discussed by Vuilleumier and Mayr (1987) and by Banks *et al.* (1993, for many others), and recommendations were proposed to avoid future such occurrences. The most recent Code (ICZN 1999) states (Art. 72.10) that "Holotypes, syntypes, lectotypes, and neotypes are the bearers of the scientific names of all nominal species-group taxa (and indirectly of all animal taxa). They are the international standards of reference that provide objectivity in zoological nomenclature and must be cared for as such ... They are to be held in trust for science by the person responsible for their safe keeping." A wild bird that is photographed can be the "type" of a name — but it can fly or even walk away, never to be seen again. In that instance, there is no person responsible for its safe keeping. The person who houses the photograph cannot be responsible for the individual that was the subject of the photograph. The person who established the name based on an itinerant individual bird cannot logistically or reasonably assume responsibility for the safe keeping — whatever that concept may entail — of a wild bird. One might conclude that it is irresponsible to designate a type that cannot possibly be provided any degree of safe keeping by anyone. If a wild bird that is temporarily restrained for the purpose of photography becomes the type of a name based on a photograph, it is not responsible safe keeping of the "specimen" to release it into the wild. Payne (1989) has discussed an instance of a name based on photographs.

When a name is based on a photograph, the type is the individual photographed; after a period of time, the type is "lost." Therefore it would be permissible to designate a specimen with those characteristics as a neotype under the appropriate condition, when "an author considers that a name-bearing type is necessary to define the nominal taxon objectively" (Article 75.1). Thus, if a species is revised and the status of a name or of a taxon based on a photograph is in doubt, the reviewer can designate a neotype. If this is done, the photograph on which the name was based loses its value. Thus, any photograph of a bird is liable to become worthless from a nomenclatural standpoint. Perhaps one of the strongest arguments against the use of photographs in this way comes from recent advances in the form of digital photography, which would make it all too easy for the unscrupulous to "invent" a species simply by manipulating photographs on a computer.

Applying the Code: Naming Birds

Most genera and species of birds have already been described and named; indeed, many have been named several times. Mayr (1957) suggested that probably no more than 20 species would be named in the next decade. Even though he later (Mayr 1971) realized that the number of new species was "by no means nearly exhausted," and

new species are being found until this day, the primary taxonomy of birds (except fossils) must be nearing an end. Most work in avian nomenclature in the future will not involve the coining of new names, but rather will concern the proper treatment of names of populations whose taxonomic status is changed because of new evidence about their relationships. Much of this will involve the elevation of what are now considered subspecies to the species level, the moving of a species from one genus to another, or moving a genus (with most or all of its included species) from one family to another. Each of these actions has been taken recently (Banks *et al.* 2003) to reflect new information provided by studies of genetics. The name of the population moves with it, but taxonomic changes may necessitate nomenclatural modifications. If a species is moved from one genus to another, the spelling of the species name, or that of a subspecies, may have to be changed slightly to reflect agreement in gender with the name of the newly assigned genus. For example, if the Snowy Owl, long known as *Nyctea scandiaca*, is transferred to the genus *Bubo*, as recommended by Wink and Heidrich (1999), the name becomes *Bubo scandiacus*. There is a possibility that the species (or subspecies) name might already be (or have been) in use in the newly assigned genus, in which case an older name may have to be resurrected or a new name may have to be coined. When the Fork-tailed Flycatcher, known as *Muscivora tyrannus* (Linnaeus, 1766), was moved into the kingbird genus *Tyrannus* by Smith (1966), the combination *Tyrannus tyrannus* (Linnaeus, 1766) was preoccupied by *Tyrannus tyrannus* (Linnaeus, 1758) and the flycatcher became known as *Tyrannus savana* Vieillot, 1808, using the next available specific name.

On the assumption that few new species names will be coined, it seems unnecessary to write a great deal about how that should be done. LeCroy and Vuilleumier (1992) have published guidelines for that procedure that should be consulted by everyone contemplating naming a new species. Helbig *et al.* (2002) give suggestions for the determination of the rank at which a new (or old) form might be recognized. The Code (ICZN 1999) sets forth the rules of nomenclature in sometimes excruciating detail. An ornithologist who spends much of his professional time on taxonomic and nomenclatural matters should become (if not already) conversant with the Code. Those ornithologists who find it necessary as a result of their studies to propose a nomenclatural change should become familiar with the Code or form an alliance with one who is knowledgeable, or both. Editors of journals that publish papers about birds should be alert to changes in nomenclature that may form a part of newly submitted manuscripts, and should refer such papers to a colleague who is trained and competent in nomenclatural matters.

Perhaps the hardest to reach with an admonition is the worker who is barely aware that a code of nomenclature exists, and who in excitement at finding something new inadvertently publishes enough information about his or her find in a non-typical publication outlet (such as a newspaper), thereby almost or actually constituting a naming of a taxon. Article 16 of the current Code (fourth edition, 1999) sets forth very explicit requirements for new names published after 1999, which should avoid accidental namings. It is best if a scientific name is not mentioned before the intentional formal description of a new taxon. It might find its way into print, where, even if not accidentally validated, it will be a *nomen nudum*, a new name unaccompanied by a description or definition (Article 13). For example, when a population of Sage-grouse was discovered in Colorado, USA, that was notably smaller than typical Sage-grouse (*Centrocercus urophasianus*), a decision was made to refer to it by the name *minimus*. The combination *Centrocercus minimus* was used at least twice in papers about the biology of the population (e.g. Commons *et al.* 1997) and once as a passing reference to identify a picture of the bird before the name was formally proposed as a new species (see Banks *et al.* 2002: 899). However, a *nomen nudum* is not available and has no standing in nomenclature, and thus can be used later for the same concept (Code, Glossary), as in this case by Young *et al.* (2000), when the new Sage-grouse was formally named.

A name that is found to be based on a hybrid is not valid and cannot be used for any taxon, even one of the parental species (Articles 17.2, 23.8). Such a name remains available, however, and can be a homonym (see below). Rasmussen and Collar (1999) determined that the name of the supposedly endangered parrot species *Psittacula intermedia* (Rothschild, 1895) was used for birds of hybrid origin. This is not a valid species, and the name *intermedia* cannot be used again in combination with that generic name (or the former generic name *Palaeornis*, in which it was originally described, should that name be revived). What might seem contradictory is that the "availability" of the specific name in this instance means that it cannot again be used in combination with either generic name; those combinations are "taken" and cannot be used for a different entity. The second use of the combination would create homonymy, use of the same name for two different taxa. This contrasts with the Sage-grouse example in the paragraph above.

A few basic rules must be mentioned, to aid in the naming of new species and generic transfers. A genus-group name is, or is treated as, a Latin noun in the nominative singular (Art. 11.8). A Latin noun connotes a gender (masculine, feminine, or neuter), and the gender of a genus-group name is determined by provisions set out in Article 30. Recently, David and Gosselin (2002b) have reviewed currently used generic names of birds and have determined or verified their gender by strict interpretation of those provisions. For any generic names proposed in the future, the derivation and gender should be specified. If new information on relationships necessitates the splitting of a genus and the revival of an old generic name, the gender of that name will need to be evaluated carefully.

The name of a species, or subspecies, must be (or have been) published in combination with a generic name and must be an adjective or participle in the nominative singular, a noun in the nominative singular standing in apposition to the generic name, a noun in the genitive case, or in some instances an adjective in the genitive case (Art. 11.9). A species-group name that is a Latin or Latinized adjective, or a participle in the nominative singular, must agree in gender with the generic name with which it is combined, and if transferred to a genus of a different gender must be changed to agree with the newly combined genus, as mentioned above. A species-group name that is a noun in apposition is invariable and does not necessarily agree in gender with the generic name. A name that is not Latin or Latinized does not change and need not agree in gender with the generic name. As with genera, rules for determining the nature of species-group names are detailed in the Code (Art. 31). Even so, some of the rules are difficult to apply properly, especially if one does not have a working knowledge of classical languages. David and Gosselin (2000, 2002a) have reviewed most current species-level names and have determined which should be considered invariable.

If the same name is applied to more than one entity at the same taxonomic level, the names are homonyms. The name proposed later, or junior homonym, is said to be "preoccupied" and must be replaced by another name. If one must coin a name for a new genus, therefore, one must be certain that it has not been used previously — not only in ornithology but in any animal group. In naming a species or subspecies, one must be certain that the name has never been used in the genus. It is best if the name has not been used in a closely related genus, to reduce the risk of creating secondary homonymy if the genera are later merged.

To avoid the inadvertent use of a generic name that has already been used, one may consult the official list of names that have been ruled on by the International Commission on Zoological Nomenclature (ICZN 1987, 2001). Avoiding homonyms at the species-group level is possible by being familiar with the names in use in the genus, as a specialist should be, or by consulting synonymies in such works as the Catalogue of Birds in the British Museum or Ridgway's Birds of North and Middle America, as far as it goes. One must avoid not only names that are currently accepted as valid for a taxon, but any name that is available even if presently considered a synonym of a current name. John Penhallurick of Australia is working on a bird data project (http://worldbirdinfo.net/) that will eventually list all combinations of generic and specific names of birds that have been used. When completed, this will be an extremely valuable tool, among other things for avoiding the creation of homonyms.

There are a few situations in birds where more than one spelling of a name is, or might be, in use. Browning (1989) showed that Swainson's generic name generally rendered as *Ptilogonys* was originally spelled *Ptiliogonys*. However, Swainson himself in various writings used both spellings, and the original form has not been used since 1887. Sibley and Monroe (1990) suggested that *Ptiliogonys* should be considered an incorrect original spelling and *Ptilogonys* a justified emendation, a course of action followed by the American Ornithologists' Union (1998). Under the present fourth edition of the Code (1999), the concept of "prevailing usage" (Art. 23.9.1) allows *Ptilogonys* to be considered valid because the original spelling has not been used after 1899 (Browning 1989) and the present spelling has been used consistently.

In my view, the concept of prevailing usage is, in addition to being contrary to the principle of priority, difficult to apply in ornithology. The concept is defined (ICZN 1999, Glossary) as "that usage [including spelling] of the name which is adopted by at least a substantial majority of the most recent authors concerned with the relevant taxon, irrespective of how long ago their work was published." Explicit rules are set forth in Article 23.9. In many fields of zoology, names are mentioned only infrequently in the literature and then only by specialists who consciously decide at the time of writing which spelling to use. Even in those fields, it may be difficult to know where all uses of a name occur and to determine which of two alternatives was used by a majority of authors. In ornithology, names may be used in dozens or hundreds of non-taxonomic papers, field guides, and faunal lists by non-specialists who may use a

Table 1. The rate of descriptions of new bird species since 1920.

period	No. of years	No. spp. desc.	No./ year	No. valid	% valid	No. valid/ year	Ref.
1920-1934	15	600	40	150*	25*	10*	Meise 1938a; Zimmer & Mayr 1943; Vuilleumier *et al.* 1992
1935-1938	4	23	6	—	—	—	Meise 1938b; Vuilleumier *et al.* 1992
1938-1941	4	53	13.3	24	45	6.0	Zimmer & Mayr 1943
1941-1955	15	74	5.3	36	49	2.5	Mayr 1957
1956-1965	10	51	5.1	35	69	3.5	Mayr 1971
1966-1975	10	48	4.8	28	58	3.1	Mayr & Vuilleumier 1983
1976-1980	5	18	3.6	12	67	2.4	Vuilleumier & Mayr 1987
1981-1990	10	46	4.6	26	56	2.4	Vuilleumier *et al.* 1992, Bahr 1995
1920-1990	70	913	13	309+	30*	4.4	Added from above
1938-1990	52	291	5.6	162	55	3.1	LeCroy & Vuilleumier 1992; Vuilleumier *et al.* 1992
1970-2000	30	170	5.6	95*	56*	3.1*	Bahr, pers. comm.

* estimated

particular spelling merely because it was used in some other recent paper, with no conscious consideration of articles of the Code and presumably with little nomenclatural "concern" for the particular taxon.

A new name should be proposed only when the author is certain that the population to be named is distinct from all other avian populations at the level at which it is named. Names based on minor variants or on samples that are too small to show distinction convincingly are probably destined for synonymies, and in essence do nothing but clutter the literature. In the past, it was possible to name a population that the author believed might prove to be distinct, as Baird (1859) did with *Myiarchus pertinax* of Baja California, Mexico. Such "conditional" names are not valid if proposed after 1960 (Code, Article 15).

Although it may be presumed that ornithologists believe that species they describe and name as new actually are "new" and distinct at the species level, the record shows that many are mistaken. In 1934, Meise (1938a) provided an analysis of 600 new species named from 1920 to 1934. He considered (Table 1) that only about 25% of the names proposed in that time were valid at the species level. Periodically since that time, new species names have been evaluated, by Meise (1938b) and by ornithologists at the American Museum of Natural History, New York (see Table 1 for references). From 1920 to 1990, more than 900 new species names were proposed, of which only about 30% were considered to be valid at the species level when analysed. The rates for valid species for any period may be slightly different because of differing taxonomic concepts. Some taxa recognized as valid species originally might now be considered only subspecifically distinct, or vice versa.

The number of species described per year declined greatly after 1941 (Table 1), perhaps a response to greatly reduced collecting during and after World War II, but remained relatively stable in the last part of the century. The proportion of species that were generally deemed valid soon after their descriptions increased in that period, and is now probably something in the order of 60-65%. Similarly, the annual number of newly described species that were considered valid by initial reviewers has held rather steady in the last half century, at about 3 per year. Most of the rest of the new names are considered synonyms of names already in use, while some are reckoned valid at the subspecies level. A few are invalid names, based on hybrids or otherwise not in compliance with the Code.

Norbert Bahr (pers. comm., June 5, 2003) has compiled a list of new taxa of birds described since 1970. Among the nearly 1300 taxa validly described are 170 named as new at the species level by 2000. In that 30 year period, the rate of naming of new species was 5.7 per year. The proportion of those described that are generally considered distinct at the species level has not been evaluated, but if it is the same as for 1981-1990 it would yield about 3 species per year.

Bahr's figures suggest that about 1100 birds were newly described at the subspecific level in 1970-2000, a rate of about 37 per year. To my knowledge, there has been no independent evaluation of the validity of most of those names, and opinions are likely to vary widely.

What's in a name?

What should be the source of a name for a bird population? This is entirely at the discretion of the namer. The Code is silent on the source of the name, but it should not have been used previously in the same (or a closely related) genus. Frequently used,

now as in the past, are names to honor people, names based on geography, and words that are suggestive of the bird or its characteristics (behavior, ecology, voice). Less frequently used are terms that indicate supposed relationships or similarities to other birds. The third edition of the Code (1985) gives recommendations (Appendix D) for the formation of specific names in most of these categories, unfortunately not reprinted in the fourth edition. Recommendations in the Code do not have the force of rules, but life is easier for all of us if they are followed. The Code (Article 31, 1999) does give specific rules for the formation of species-group names formed from personal names, or patronyms.

Alan Peterson (pers. comm.) has provided a list of species names used in currently recognized bird species, in order of frequency. The top 30 names, including those used 16 or more times, appear in Table 2. This list suggests the features of birds that are most important in their recognition or definition. These are size, color, features of the head, including the bill, and geographic origin.

The name *minor* is the most frequently used descriptor of size, occurring 26 times. At the other end of the scale, *major* is used for 15 species. If *maximus* and *minimus* (for adjectives that have variable endings to indicate gender, I give only the masculine in this section, to include also feminine and neuter endings) are taken into account, small birds slightly outnumber large ones, but there are many other words used to indicate size or relative size.

People who have named birds have been impressed by the variety, or lack of variety, of color on their subjects. The number and variety of colors has been important — *unicolor* and *bicolor* each appear 21 times, *tricolor* 16 times, and *quadricolor* and *quinticolor* each twice. The name *concolor* (9 times) presumably is the same as *unicolor*, suggesting that relatively drab birds outnumber multicolored ones, until *versicolor* (16), *discolor* (= variegated) (5 times) and *multicolor* (4) are considered.

The basic colors of birds are also reflected by their names. The most frequently used color descriptor is *cinereus* (40), followed by *olivaceus* (30), *niger* (27), *fuscus* (26), and *viridis* (25). I have not attempted to determine how frequently these colors occur in compound words.

Except for a notation of a crest (*cristatus*, 30) crown (*coronatus*, 22), or tail (*caudatus*, 11) the names of body parts generally do not appear without modifiers. Features of the head seem to be the most remarkable. Roots indicating head characteristics such as *-ceps* (135), *-cephal-* (116), and *-capill-* (71), often combined with color-indicating prefixes, are most frequent. The nature of the bill, *-rostr-* (182), in size, shape, or color, is often noted. The presence of a collar (*collaris* 103, *torquatus* 49) is also a frequently noted distinguishing character, alone or with a modifier.

Many species are known for where they occur or were first found. Senegal is the locality most frequently noted in a specific epithet, with 18 names in some form, mostly *senegalensis*. Six of the 13 species with the epithet *senegalensis* were named by Linnaeus (1766) in the 12th edition of *Systema Naturae*, suggesting that he had a fixation on that locality. However, all are based on the same names used by Brisson, whose pre-1766 work was not consistently binomial, denying him modern credit for names proposed in them. A similar situation holds for the frequently used (16 times) name *madagascariensis*, with variants. Linnaeus named 5 of 14 species with that epithet in 1766, and Gmelin added two in 1789, all using a name previously used by Brisson. Other place names with multiple uses are *americanus* (16), *mexicanus* (16), and *nipalensis* (16).

The individual most honored by having bird species named after him is P. L. Sclater, whose name is the basis of the current valid species name for 18 species (Table 3). The index volume for the Peters check-list (Paynter 1987) lists 74 species level entries based on Sclater's name, although a very small number of these may perhaps honour his son, W. L. Sclater. Some of the other 56 entries represent synonyms of presently accepted species names as combined with other generic names, whereas others are presently recognized at the subspecific level. A quick review of that index volume suggests that John Gould, with more than 40 entries, should be among the most recognized in avian nomenclature, but there are actually only three currently valid uses of his name as a species name. Perhaps somewhat ironically, neither Linnaeus nor Gmelin, compilers of the *Systema Naturae*, has a bird species validly named in his honor.

From the data base on his web site (www.zoonomen.net), Alan Peterson has tabulated the names of authors credited with establishing the largest numbers of names of currently recognized (Sibley and Monroe 1990, updated) bird species (Table 4). As the author of the first work to be considered for the law of priority, Linnaeus understandably takes top place, being credited with about 710 current species names. Not all of the 710 date from the 10th edition of the *Systema Naturae*, however. Some are from the 12th edition and a few are from other works. Even so, this is less than 10% of the approximately 10,000 species now recognized. Statius Muller (1776), in a

Table 2. Most frequently used descriptors as species names for birds.

Name	Number
cinereus, -a, -um	40
cristatus, -a	40
olivaceus , -a, -um	30
niger, -ra, -rum	27
minor	26
fuscus, -a	26
viridis	25
affinis	25
gularis	24
capensis	23
coronatus, -a	22
superciliaris	22
unicolor	21
crassirostris	21
bicolor	21
ruficollis	20
pectoralis	20
elegans	19
australis	19
sclateri	18
ruficeps	18

Table 3. Most frequently honored people

Name	Current valid species	Citations in Peters index
Sclater*	18	74
Finsch	12	19
Hartlaub	12	26
Cassin	10	27
Swainson	10	25
Temminck	9	25
Berlepsch	9	58
Baird	8	24
Fischer**	8	29
Pelzeln	8	18
Ridgway	8	52
Sharpe	8	58

* P. L. Sclater; a very small proportion of these totals may be taxa named after his son, W. L. Sclater.

** G. A. Fischer; a very small proportion of these totals may be taxa named after J. G. Fischer von Waldheim.

Table 4. Ornithologists who have provided currently valid names for 100 or more species.

Number	Name
714	Linnaeus
429	Sclater, P.L.
395	Vieillot
385	Gould
356	Gmelin, J.F.
351	Temminck
230	Lafresnaye
216	Salvin
204	Sharpe
185	Bonaparte
184	Lesson
175	Blyth
166	Hartlaub
163	Gray, G.R.
155	Latham
153	Reichenow
144	Cabanis
136	Salvadori
130	Swainson
127	Hartert
123	d'Orbigny
111	Vigors
107	Boddaert
103	Lawrence

supplement to a German edition of Linnaeus, and J. F. Gmelin (1788/89), primarily in a 13th (= 14th, see Iredale 1958) edition of *Systema Naturae*, added 433 species, so it can be said that Linnaeus's work and expansions on it account for about 1143 names. A few other authors actively provided names for birds in the period between the 10th and 12th editions — Scopoli, Brisson, Pallas, and Brünnich, for example — and a few others, such as Latham, before the turn of the nineteenth century. Perhaps as many as 1400 species had been named by that time. There was then a quiet time in naming new bird species that lasted from shortly after Gmelin's 13th edition until about the 1820s, when Vieillot began to name a large number of taxa. Publication of large numbers of names continued until about 1900. There was some slackening until about the 1940s and World War II, after which the number of new names has been moderate and fairly regular.

Conclusion

This essay has covered only a few of the 90 articles of the International Code of Zoological Nomenclature. The Code is a complex document that still requires interpretation and refinement. It is not important that every ornithologist or birder who finds, or thinks he finds, a new taxon be an authority on the Code, but everyone who wants to name a new species or subspecies should be aware that there is a Code, and be willing to seek assistance in complying with it. Editors, in particular, should be alert to possible taxonomic implications in papers that they receive for publication, and be certain that at least one referee or reviewer is familiar with this aspect of our science. In the not-too-distant past there have been instances of birds being named, or almost named, by accident or in a non-scientific publication. Certain provisions of the current Code are designed to decrease the likelihood of that happening by requiring an explicit statement that a taxon is new, and that a type be designated and the place of its deposit be indicated. With just a little co-operation and forethought we can be assured that ornithological nomenclature will retain the high standards it is known for.

Richard C. Banks
National Museum of Natural History
Washington DC
USA

References Cited

Amadon, D. (1966). The superspecies concept. *Syst. Zool.* **15**: 245-249.

Amadon, D. (1968). Further remarks on the superspecies concept. *Syst. Zool.* **17**: 345-346.

Amadon, D. & Short, L.L. (1976). Treatment of subspecies approaching species status. *Syst. Zool.* **25**: 161-167.

AOU (1886). *Code of Nomenclature and Check-list of North American Birds*. American Ornithologists' Union, New York.

AOU (1910). *Check-list of North American Birds*. 3rd edition. American Ornithologists' Union, New York.

AOU (1983). *Check-list of North American Birds*. 6th edition. American Ornithologists' Union, Washington, D.C.

AOU (1998). *Check-list of North American Birds*. 7th edition. American Ornithologists' Union, Washington, D.C.

Bahr, N. (1995). Additions to the list of new species of birds described from 1981 to 1990. *Bull. Brit. Orn. Club* **115**: 114-116.

Baird, S.F. (1859). Notes on a collection of birds made by Mr. John Xantus, at Cape St. Lucas, lower California, and now in the Museum of the Smithsonian Institution. *Proc. Acad. Nat. Sci. Philadelphia* **11**: 299-306.

Banks, R.C. (1978). Nomenclature of the Black-bellied Whistling-Duck. *Auk* **95**: 348-352.

Banks, R.C., Cicero, C., Dunn, J.L., Kratter, A.W., Rasmussen, P.C., Remsen, J.V., Rising, J.D. & Stotz, D.F. (2002). Forty-third supplement to the American Ornithologists' Union *Check-list of North American Birds*. *Auk* **119**: 897-906.

Banks, R.C., Cicero, C., Dunn, J.L., Kratter, A.W., Rasmussen, P.C., Remsen, J.V., Rising, J.D. & Stotz, D.F. (2003). Forty-fourth supplement to the American Ornithologists' Union *Check-list of North American Birds*. *Auk* **120**: 923-931.

Banks, R.C., Goodman, S.M., Lanyon, S.M. & Schulenberg, T.S. (1993). Type specimens and basic principles of avian taxonomy. *Auk* **110**: 413-414.

Bock, W.J. (1994). *History and Nomenclature of Avian Family-group Names*. Bulletin of the American Museum of Natural History **222**, New York. 281 pp.

Browning, M.R. (1989). The correct citation and spelling of *Ptiliogonys* and type locality of *Ptiliogonys cinereus*. *Auk* **106**: 743-746.

Campbell, B. & Lack, E. (1985). eds. *A Dictionary of Birds*. T. & A.D. Poyser, Calton, UK.

Chapman, F.M. (1917). *The Distribution of Bird-life in Colombia: a Contribution to a Biological Survey of South America*. Bulletin of the American Museum of Natural History **36**.

Commons, M.L., Baydack, R.K. & Braun, C.E. (1997). Gunnison Sage Grouse *Centrocercus minimus* use of fragmented habitats in southwestern Colorado. *Wildl. Biol.* **3**: 283.

David, N. & Gosselin, M. (2000). The supposed significance of originally capitalized species-group names. *Bull. Brit. Orn. Club* **120**: 261-266.

David, N. & Gosselin, M. (2002a). Gender agreement of avian species names. *Bull. Brit. Orn. Club* **122**: 14-49.

David, N. & Gosselin, M. (2002b). The grammatical gender of avian genera. *Bull. Brit. Orn. Club* **122**: 257-281.

Edwards, G. (1751). *A Natural History of Birds*. Part 4. London. pp. and pl. 158-210.

Eisenmann, E. & Poor, H.H. (1946). Suggested principles of vernacular nomenclature. *Wilson Bull.* **58**: 210-215.

Gmelin, J.F. (1788/89). *Systema Naturae, per Regna Tria Naturae: secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis*. 13th edition. Vol. 1 (1-2). G. E. Beer, Lipsiae.

Gray, G.R. (1840). *A List of the Genera of Birds, with an Indication of the Typical Species of Each Genus*. London.

Gray, G.R. (1855). *Catalogue of the Genera and Subgenera of Birds Contained in the British Museum*. British Museum, London.

Helbig, A.J., Knox, A.G., Parkin, D.T., Sangster, G. & Collinson, M. (2002). Guidelines for assigning species rank. *Ibis* **144**: 518-525.

ICZN (1961). *International Code of Zoological Nomenclature*. 2nd edition. International Trust of Zoological Nomenclature, London.

ICZN (1985). *International Code of Zoological Nomenclature*. 3rd edition. International Trust of Zoological Nomenclature, London.

ICZN (1987). *Official Lists and Indexes of Names and Works in Zoology*. International Trust of Zoological Nomenclature, London.

ICZN (1999). *International Code of Zoological Nomenclature*. 4th edition. International Trust of Zoological Nomenclature, London.

ICZN (2001). *Official Lists and Indexes of Names and Works in Zoology, Supplement 1986-2000*. International Trust of Zoological Nomenclature, London.

Iredale, T. (1958). On the thirteenth edition of Linné's *Systema Naturae*. *Proc. Royal Zool. Soc. New South Wales* **1956-1957**: 61-62.

LeCroy, M. & Vuilleumier, F. (1992). Guidelines for the description of new species in ornithology. *Bull. Brit. Orn. Club* **112A**(Suppl.): 191-198.

Linnaeus, C. (1758). *Systema Naturae per Regna Tria Naturae secundum Classes, Ordines, Genera, Species cum Characteribus, Differentiis Synonymis, Locis*. 10th edition. Vol. 1. Holmiae Salvii.

Linnaeus, C. (1766). *Systema Naturae per Regna Tria Naturae Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis*. 12th edition. Vol. 1. Holmiae Salvii.

Mayr, E. (1957). New species of birds described from 1941 to 1955. *J. Orn.* **98**: 22-35.

Mayr, E. (1971). New species of birds described from 1956 to 1965. *J. Orn.* **112**: 302-316.

Mayr, E. & Cottrell, G.W. eds. (1979). *Check-list of Birds of the World*. Vol. 1. 2nd edition. Museum of Comparative Zoology, Cambridge, Massachusetts.

Mayr, E. & Vuilleumier, F. (1983). New species of birds described from 1966 to 1975. *J. Orn.* **124**: 217-232.

Meise, W. (1938a). Fortschritte der ornithologischen Systematik seit 1920. Pp. 49-189 in: Jourdain, F.C.R. ed. (1938). *Proceedings of the VIII International Ornithological Congress, Oxford 1934*. Oxford University Press, Oxford.

Meise, W. (1938b). Exposition de types d'oiseaux nouvellement décrits au Muséum de Paris. Pp. 46-51 in: Delacour, J. ed. (1938). *Compte Rendu IX Congrès Ornithologique International, Rouen*. Secrétariat du Congrès, Rouen.

Melville, R.V. (1995). *Towards Stability in the Names of Animals. A History of the International Commission on Zoological Nomenclature 1895-1995*. International Trust for Zoological Nomenclature, London.

Oberholser, H.C. (1921). The geographic races of *Cyanocitta cristata*. *Auk* **58**: 83-89.

Payne, R.B. (1989). Commentary on the Mellba Finches *Pytilia melba* of Djibouti and the requirement of a specimen for a taxonomic description. *Bull. Brit. Orn. Club* **109**: 117-119.

Paynter, R.A. (1987). *Check-list of Birds of the World: Comprehensive Index*. Vol. 16. Museum of Comparative Zoology, Harvard University Press, Cambridge, Massachusetts.

Peters, J.L. (1931). *Check-list of Birds of the World*. Vol. 1. Museum of Comparative Zoology, Harvard University Press, Cambridge, Massachusetts.

Peterson, A.P. (2003). www.zoonomen.net.

Rasmussen, P.C. & Collar, N.J. (1999). On the hybrid status of Rothschild's Parakeet *Psittacula intermedia* (Aves, Psittacidae). *Bull. Nat. Hist. Mus. London (Zool.)* **65**: 31-50.

Sclater, P.L. & Salvin, O. (1873). *Nomenclator Avium Neotropicalium sive avium quæ in regione neotropica hucusque repertæ sunt nomina systematice disposita adjecta sua cuique speciei patria accedunt generum et specierum novarum diagnosis.* The Authors, London.

Sherborn, C.D. (1899). *An Index to the Generic and Trivial Names of Animals Described by Linnaeus, in the 10th and 12th Editions of his Systema Naturae.* Publications of the Manchester Museum **25**, Owens College, Manchester.

Sibley, C.G. & Monroe, B.L. (1990). *Distribution and Taxonomy of Birds of the World.* Yale University Press, New Haven & London.

Smith, P.W. (1992). Standardization of English bird names. *Birding* **24**: 37-41, 97-101.

Smith, W.J. (1966). *Communication and Relationships in the Genus* Tyrannus. Publications of the Nuttall Ornithological Club **6**, Cambridge, Massachusetts.

Statius Muller, P. L. (1776). *Des Ritters Carl von Linné Königlich Schwedischen Lelbarztes uc. uc. vollständigen Natursystems Supplements und Register-Band über alle sechs Theile oder Classen des Thierreichs mit einer ausführlichen Erflärung ausgefertiget.* G. N. Raspe, Nüremberg.

Vuilleumier, F. & Mayr, E. (1987). New species of birds described from 1976 to 1980. *J. Orn.* **128**: 137-150.

Vuilleumier, F., LeCroy, M. & Mayr, E. (1992). New species of birds described from 1981-1990. *Bull. Brit. Orn. Club* **112A**(Suppl.): 267-309.

Welch, G.R. & Welch, H.J. (1988). A new subspecies of *Pytilia melba* from Djibouti, East Africa. *Bull. Brit. Orn. Club* **108**: 68-69.

Wink, M. & Heidrich, P. (1999). Molecular evolution and systematics of the owls (Strigiformes). Pp. 39-57 in: König, C., Weick, F. & Becking, J.H. (1999). *Owls: A Guide to the Owls of the World.* Yale University Press, New Haven.

Young, J.R., Braun, C.E., Oyler-McCance, S.J., Hupp, J.W. & Quinn, T.W.. (2000). A new species of sage-grouse (Phasianidae: *Centrocercus*) from southwestern Colorado. *Wilson Bull.* **112**: 445-453.

Zimmer, J.T. & Mayr, E. (1943). New species of birds described from 1938-1941. *Auk* **60**: 249-262.

Description of a new tribe of fluvicoline tyrant-flycatchers

The subfamilial and tribal classification of the Tyrannidae remains inexact, as the mosaic of anatomical and behavioral character states most useful for diagnosing closely related assemblages of tyrannid genera contains numerous irresolvable conflicts. The most explicit attempt to integrate these various characters and character states into a phylogenetic hypothesis for the entire family (Birdsley 2002) yielded a strict consensus tree, bearing only rudimentary structure. Birdsley's work supports an earlier hypothesis by Lanyon (1984, 1985) that monophyletic "kingbird" and "*Myiarchus*" assemblages (tribes Tyrannini and Attilini, respectively) characterize the subfamily Tyranninae, and also supports the existence of a monophyletic "*Empidonax* assemblage" (Lanyon 1986). Unfortunately, most of the remaining tyrannid genera are arrayed along a massive polychotomy, bearing little information about deep relationships of genera. Moreover, Birdsley's analysis incorporated comparatively plastic characters such as plumage pattern (e.g. color of tail, presence of wingbars, etc.) and foraging mode. With these characters removed from his analysis, Birdsley's tree loses structure even further. Without doubt, detailed molecular analyses will be essential for sorting out phylogenetic relationships within the Tyrannidae at the level of tribe and subfamily.

Bearing in mind this caveat, our present taxonomic treatment of the Tyrannidae clusters genera into more or less recognizable subfamilies and tribes, following the suggestions of Traylor (1977) and Lanyon (1984, 1985, 1986, 1988a, 1988b, 1988c), applying the most appropriate names available from the existing literature, as capably reviewed by those authors. In sorting genera into these groups it came to our attention that one of the most familiar clusters of tyrannid genera lacks a formally proposed name. I describe it here. The following diagnosis and discussion applies to a portion of Birdsley's (2002) "restricted *Empidonax* assemblage" and to Lanyon's (1986) "*Empidonax* group". The anatomical characters mentioned here are described in detail in those publications. However, the exact list of genera included in the tribe is slightly modified from both, as discussed below. The name Contopini is proposed

because the genus *Contopus* comprises a numerically important element of the group, and because this name was informally suggested for this group in an unpublished, but landmark, doctoral dissertation by Warter (1965). Ecologically, this group is a rather homogeneous assemblage of forest-inhabiting tyrannids that sally upward and outward for prey either in the air (*Contopus* and relatives) or against leafy vegetation (the *Empidonax* group). The genus *Sayornis* represents an ecological and morphological transition to the other fluvicoline tribe, Fluvicolini, as described below.

Contopini — new tribe
Type genus: *Contopus* Cabanis, 1855

Diagnosis: sexually monomorphic tyrant-flycatchers (family Tyrannidae); external morphology includes triangular-shaped bill, comparatively broad at base tapering to pointed tip, bearing modest hook at tip of culmen; rictal bristles well developed; nest typically a neatly constructed open cup placed on horizontal limb or ledge, or slung from a fork in a horizontal branch; identifiable as belonging to the subfamily Fluvicolinae, principally in possessing a fully ossified nasal septum bearing a transverse trabecular plate located along the ventral edge of the septum, this plate in most cases lacking a sagittal ridge and possessing both an anterior notch and a posterior fork; identifiable to tribe Contopini by having syrinx with one or more complete or nearly complete calcified rings ("A elements" in terminology of Lanyon and Warter) on each bronchus posterior to tracheobronchial junction, sometimes medially cartilaginous and connected by a plug of cartilaginous tissue just caudal to tracheobronchial junction, and in one monophyletic group further modified for attachment of internal cartilage (see below).

Typical genera. The following genera are unambiguously included within the Contopini on the basis of conflict-free possession of the diagnostic characters: *Lathrotriccus*, *Aphanotriccus*, *Xenotriccus*, *Cnemotriccus*, *Empidonax*, *Contopus*, *Mitrephanes*, and *Sayornis*. These constitute Lanyon's (1986) "*Empidonax* group," and are united as a monophyletic clade most importantly by having the cartilaginous segments of the A2 syringeal rings modified for attachment of internal cartilage.

Atypical genera. The following genera are tentatively placed in the Contopini, but possess character conflicts that reduce our certainty about their inclusion. *Myiophobus* contains several species (*fasciatus, flavicans,* and *inornatus*) in which the nasal septum is consistent with the Contopini, but several other species in which the same characters are slightly different (e.g. absence of fork in trabecular plate); this genus may be polyphyletic (Lanyon, 1986). *Pyrrhomyias* and *Hirundinea* have nearly typical fluvicoline nasal septa, although their trabecular plate lacks a fork, and they cluster with *Myiophobus* on the basis of a derived syringeal character (one or two completely calcified rings around bronchi independent of tracheobronchial junction).

Genera *incertae sedis*. The genera *Myiobius, Terenotriccus*, and *Neopipo* have puzzled taxonomists for years (Mobley & Prum 1995). They cluster together on the basis of both cranial and syringeal characters; indeed, both Lanyon and Birdsley lumped *Terenotriccus* into *Myiobius*. The nasal septum of *Terenotriccus* and some specimens of *Myiobius* are of the derived fluvicoline type typical of the Contopini; the skull of *Neopipo* is lacking from collections. The syringes of all three genera, although different from one another in detail, are consistent with inclusion in the Contopini. However, these species construct pendant nests, which is otherwise absent within the Fluvicolinae and has been suggested as evidence for their relationship with the large group of pendant-nest builders in the Elaeniinae (especially *Cnipodectes* and *Onychorhynchus*). We treat these as transitional genera of uncertain affinity, and suggest that future research explore the possibility that the genera *Onychorhynchus*, *Cnipodectes*, *Myiobius*, *Terenotriccus,* and *Neopipo* (and perhaps several species of *Myiophobus*) constitute a tribe or subfamily of their own.

Fluvicolini. The remaining genera of the subfamily Fluvicolinae constitute the tribe Fluvicolini. These represent an assemblage of medium- to large-bodied, terrestrial and near-ground specialists occupying open country, with a clear center of radiation in the non-forested areas of South America, especially Patagonia and the high Andes. Within this tribe are several closely related groups hypothesized by Lanyon (1985, but see Birdsley, 2002) to be internally monophyletic on the basis of cranial or syringeal characters: the sexually dimorphic "*Knipolegus* group" (genera *Pyrocephalus*, *Lessonia,*

Knipolegus, and *Hymenops*), the large, mostly terrestrial "*Muscisaxicola* group" (*Muscisaxicola, Agriornis, Xolmis, Myiotheretes, Cnemarchus, Polioxolmis, Neoxolmis, Gubernetes,* and *Muscipipra*), and the "*Ochthoeca* group" (*Arundinicola*, *Fluvicola*, *Alectrurus*, *Tumbezia*, *Ochthoeca*, and *Colorhamphus*). Finally, two monotypic genera (*Ochthornis* and *Satrapa*) are unambiguously fluvicoline based on anatomical characters, but have ambiguous affinities within the Fluvicolini. Three additional monotypica genera traditionally grouped with this assemblage (*Colonia, Muscigralla*, and *Machetornis*) are morphologically, anatomically, and ecologically confusing, and are best considered *incertae sedis*.

John Fitzpatrick
Director, Cornell Laboratory of Ornithology
Cornell University, New York, USA

Acknowledgements

I thank Richard Banks and Walter Bock for their assistance with this manuscript; I thank Wesley Lanyon for his painstaking anatomical research and for his many long hours of discussion and debate with me about tyrannid systematics.

References cited

Birdsley, J.S. (2002). Phylogeny of the tyrant flycatchers (Tyrannidae) based on morphology and behavior. *Auk* **119(3)**: 715-734.

Cabanis, J.L. (1855). Dr. J. Gundlach's Beiträge zur Ornithologie Cuba's. Nach Mittheilungen des Reisenden an Hr. Bez.-Dir. Sezekorn in Cassel; von Letzterem zusammengestellt. Mit Zusätzen und Anmerkungen geordnet vom Herausgeber. Fortsetzung. *J. Orn.* **3**: 465-480.

Lanyon, W.E. (1984). A phylogeny of the kingbirds and their allies. *Amer. Mus. Novit.* **2797**: 1-28.

Lanyon, W.E. (1985). A phylogeny of Myiarchine flycatchers. Pp. 360-380 in: Buckley, P.A., Foster, M.S., Morton, E.S., Ridgely, R.S. & Buckley, F.G. eds. (1985). *Neotropical Ornithology*. Ornithological Monographs **36**. American Ornithologists' Union, Washington, D.C.

Lanyon, W.E. (1986). A phylogeny of the thirty-three genera in the *Empidonax* assemblage of tyrant flycatchers. *Amer. Mus. Novit.* **2846**: 1-29.

Lanyon, W.E. (1988a). A phylogeny of the thirty-two genera in the *Elaenia* assemblage of tyrant flycatchers. *Amer. Mus. Novit.* **2914**: 1-57.

Lanyon, W.E. (1988b). The phylogenetic affinities of the flycatcher genera *Myiobius* Darwin and *Terenotriccus* Ridgway. *Amer. Mus. Novit.* **2915**: 1-11.

Lanyon, W.E. (1988c). A phylogeny of the flatbill and tody-tyrant assemblage of tyrant flycatchers. *Amer. Mus. Novit.* **2923**: 1-41.

Mobley, J.A. & Prum, R.O. (1995). Phylogenetic relationships of the Cinnamon Tyrant, *Neopipo cinnamomea*, to the tyrant flycatchers (Tyrannidae). *Condor* **97(3)**: 650-662.

Traylor, M.A. (1977). A classification of the tyrant flycatchers (Tyrannidae). *Bull. Mus. Comp. Zool.* **148**: 128-184.

Warter, S.L. (1965). *The Cranial Osteology of the New World Tyrannoidea and its Taxonomic Implications*. PhD thesis, Louisiana State University, Baton Rouge, Louisiana.

Introduction to Volume 9

This, the second of the passerine volumes, can be considered a taxonomically significant one. It includes the last of the suboscine families, the first of the oscines, and in between the three small Australasian families that have often been treated to some extent as transitional. From here onwards all the remaining families in the series are oscine, all occupying the same suborder that is generally agreed to comprise the most highly evolved of all the birds. It is also worth noting that Volume 9 covers the largest of all the bird families, in the shape of Tyrannidae, with some 429 species.

After eight volumes' worth of introductions, we have little of relevance left to say by way of explaining how the series works, so this time round we shall give the reader a break and limit ourselves to a few assorted brief notes on the subject of names.

With the great upsurge of popular interest in taxonomy and related subjects in recent years, we felt that it really was time that we had a foreword explaining some of the main principles and rules of nomenclature. To this end, we have been extremely fortunate that Richard Banks kindly agreed to contribute an essay on the subject, and we think readers will agree that he has covered the main details of this complicated subject with admirable clarity.

Staying with the same subject, this current volume has turned up quite a new situation for us. While working on the internal classification of the Tyrannidae for HBW, John Fitzpatrick noticed that one of the subdivisions that he intended to recognize did not have a formally proposed name. In order to remedy this situation in time for the "tribe Contopini" to be validly usable for HBW, John has written the formal description of this tribe for publication in the present volume (pp. 25-27), in this way making quite certain that the description could not be delayed and end up being published later than the HBW text for which it was required. While HBW might appear an odd medium for publishing a new scientific name, we would like to stress that we did check with various experts in the field, most notably Walter Bock, and all agreed that HBW meets the requirements more than adequately. Indeed, it was even mentioned that HBW is particularly appropriate in terms of one of the most important criteria of all, as the series is more readily accessible to a greater proportion of the broad ornithological community worldwide than are quite a number of important ornithological journals. Having the description written by one of the foremost authorities on the family Tyrannidae, and having it refereed by two of ornithology's most prestigious taxonomists, are guarantees that all efforts have been made to ensure that this description has been aptly and correctly formulated.

Before leaving the subject of nomenclature, we should like to make a further point. In recent times a great number of species-group names have undergone slight modifications, due to incorrect previous usage. This is the result of detailed studies aimed at clearing up many long-standing errors, and published in two papers:

David, N. & Gosselin, M. (2002a). Gender agreement of avian species names. *Bull. Brit. Orn. Club* **122**: 14-49.

and

David, N. & Gosselin, M. (2002b). The grammatical gender of avian genera. *Bull. Brit. Orn. Club* **122**: 257-281.

This work has led to the modification even of some rather well-known names, and a fair number of such emendations appear in the present volume.

Still in the field of bird names, though unrelated to the formal Code that regulates scientific nomenclature, the latest batches of accepted Spanish names to have been

published can be found in *Ardeola* **49(1)**: 121-125 (HBW 7) and *Ardeola* **50(1)**: 103-110 (HBW 8).

One final note that we should like to make must inevitably be connected with names too! At last, we have taken the decision that the name "Zaire" really has become obsolete. Thus, in accordance with current usage, in the present volume we have renamed the country in question as "DRCongo". This is not to be confused with the neighbouring country hitherto known simply as "Congo", and now for the purposes of HBW renamed as "PRCongo".

Acknowledgements

This has been another volume in which the contribution of museums has been particularly notable. Our first ports of call are always the British Museum of Natural History at Tring (Robert Prys-Jones, Michael Walters, Mark Adams), the American Museum of Natural History in New York (Joel Cracraft, George Barrowclough, Mary LeCroy, Paul Sweet, Shannon Kenney, Peter Capainolo, Maria Rios), the Louisiana State University Museum of Natural Science (Van Remsen, Steve Cardiff, Donna Dittmann, Dan Lane, John O'Neill), the Smithsonian Institution, National Museum of Natural History in Washington (James Dean, Gary Graves), and the Colección Phelps de Venezuela (Miguel Lentino, Margarita Martínez, Clemencia Rodner, Robin Restall). Other institutions that made very helpful contributions include the Australian Museum in Sydney (Walter Boles), the Departamento de Zoologia Universidade São Paulo (Luís Fabio Silveira, Fernando Mendonça d'Horta), the Bombay Natural History Society (Saraswathy Unnithan, Zafar-ul Islam), the Royal Museum for Central Africa in Tervuren (Michel Louette), the National Museum of Costa Rica (Julio E. Sánchez), the Museum of New Zealand Te Papa Tongarewa (Alan Tennyson), the National Museums of Scotland in Edinburgh (Bob McGowan), Liverpool Museum (Tony Parker), the Transvaal Museum (Tamar Cassidy), the Edward Grey Institute of Field Ornithology at Oxford University (Linda Birch), the Field Museum in Chicago (David Willard, Shannon Hackett), the Delaware Museum of Natural History (Gene Hess), the Museum of Comparative Zoology in Harvard (Alison Pirie, Peter Alden, Jeremiah Trimble), the Natuurhistorisch Museum at Leiden (René Dekker) and the Academy of Natural Sciences at Philadelphia (Nate Rice).

The task of sorting out all the details of the bibliography and references is a huge one, and relies heavily on help received from a whole host of different sources. We should particularly like to thank *Africa Birds & Birding* (Eve Gracie), David Allan, *Aves Argentinas* (Ignacio Roesler, Darío Unterkofler), the Bombay Natural History Society (J. C. Daniel), the British Museum of Natural History at Tring (Alison Harding, Lorraine Portch, Kamila Reekie), Murray Bruce, Normand David, Edward Dickinson, the Faculty of Natural Science and Museum of La Plata (Guillermo Soave), *Der Falke* (Einhard Bezzel), Georg Grothe, Juan Carlos Guix, HANZAB (Will Steele), Tomas Knotek, the Museum of Zoology of the University of Michigan (Janet Hinshaw, Janet Bell), the Ornithological Society of Bavaria (Juliane Diller), the Ornithological Society of New Zealand, Mark Robbins, the Sociedad Española de Ornitología (Blas Molina), *Western Birds* (Philip Unitt) and Piotr Tryjanowski. We must also make a special mention of the assistance received from Diego Calderón Franco; we are very sorry to have to report that at the time of writing he has yet to be released by his kidnappers, and we add our collective voice to the pleas for his safe delivery.

Our sincere thanks go to all those who have helped in so many different ways to improve the content of the volume, for instance by sending us unpublished information or refereeing texts, and in particular we must mention David Ascanio, Murray Bruce, Normand David, Jon Fjeldså, Mary LeCroy, Sjoerd Mayer, Petro Pynnönen, Craig Robson, Peter Ryan, Ian Sinclair, Barry Walker, David Wells and Bret Whitney.

Several people made important contributions to the Tyrannidae species accounts, although they were not actually authors of any full accounts. We are very grateful to Kristof Zyskowski, Isabelle Bisson, Greg Budney, Caroline Dingle, Van Remsen and Tom Schulenberg.

Once again, Robert Ridgely has most generously and efficiently revised all the maps affecting Neotropical species. Although this volume includes slightly fewer Neotropical species than the previous one, it still presented an enormous number to deal with over a relatively short period. Jeff Price has very kindly done the same job for the North American species, and in addition has checked and commented on the Status and Conservation sections of these same species. We offer our grateful thanks to both of them for their invaluable input.

We are extremely pleased to maintain our most useful agreement with VIREO at the Academy of Natural Sciences in Philadelphia (Doug Wechsler). Similarly, we are

very fortunate to be able to continue to enjoy the wealth of Guy Tudor's photo collection, which is of great help in many aspects of the work.

The French, German and Spanish names continue to come from the same sources as before, and we thank Normand David, Christoph Hinkelmann and Peter Barthel, and Eduardo de Juana, together with their respective associates, for their kind and efficient assistance throughout.

The individual authors and artists would like to offer their thanks to the following: Jan Andersson, Neil and Liz Baker, Richard Banks, Eustace Barnes, Keith Barnes, William Belton, Linda Birch, Isabelle Bisson, Paulette Bloomer, Wendy Borello, Charles Brown, Enrique Bucher, Greg Budney, Peter Capainolo, Stephen W. Cardiff, Geoff Carey, Vivianna Caro, Les Christidis, Rob Clay, M. Clout, Callan Cohen, Sarah Comer, Rene Corado, Phyllis Dague, Ann Danks, Pete Davidson, Richard Dean, E. C. Dickinson, Barny Dunning, Jessica R. Eberhard, Siegfried Eck, Victor Emanuel, Derek Engelbrecht, He Fen-qi, Lincoln Fishpool, Jon Fjeldså, Jeremy Flanagan, John Flynn, Edward Gavrilov, Alexander Gilmour, Alejandro Grajal, Richard Gregory, Mary Guthrie, M. Hansell, Jesús Herranz, Andrew Hester, Chris Hewson, Paul Holt, Ian Hood, Jesper Hornskov, Julian Hough, Álvaro Jaramillo, P. Jones, Guy Kirwan, Joris Komen, Niels Krabbe, Jeri Langham, Kathleen Langham, Wesley E. Lanyon, the late Richard Liversidge, Penn Lloyd, Florentino de Lope, Tim Lovegrove, Michael Magrath, Helen Marshall, G. R. Martin, Sjoerd Mayer, Juan Mazar Barnett, D. B. McDonald, Krister Mild, Jeremy Minns, Anders Møller, Coleen Moloney, Eugene Morton, D. Oschadleus, Robin Panza, V. Parker, Ricardo Parrini, Mark Pearman, Stephen Piper, Alan Poole, R. O. Prum, Robert Prys-Jones, Paulo C. Pulgarín-R., Keith Read, Van Remsen, Raleigh Robertson, C. Robson, Kees Roselaar, Philip D. Round, Patricia Ryan, Paul Salaman, Hans Schmid, Richard Schodde, Tom Schulenberg, Mary Sears, Chris Sharpe, Fred Sheldon, Ian Sinclair, Jacalyn Spoon, Claire Spottiswoode, Ali Stattersfield, Ian Stewart, Bridget Stutchbury, Tibor Szép, G. Tebb, Derek Thomas, P. W. Trail, Lindsay Tyler, L. Underhill, Gary Voelker, Barry Walker, B. A. Walther, Bret Whitney, Andrew Whittaker, David Willard, E. O. Willis, Mike Wilson, David Winkler, Jo Wrigley, Miguel Yanes and Kristof Zyskowski, and also the Ewell Sale Stewart Library at the Academy of Natural Sciences in Philadelphia, the American Museum of Natural History, the Australian National University, the Carnegie Museum of Natural History, the Cornell University Museum of Vertebrates, the Field Museum of Natural History in Chicago, Louisiana State Museum of Natural Science, Monash University, the Peabody Museum at Yale University, the Smithsonian Institution, the Museum of Victoria, and the Western Foundation of Vertebrate Zoology. Quico Suárez would like to present a special thank you to his recently departed mother, Antonia Cardona.

As ever, we would like to show our grateful appreciation for all the various different forms of help received from Mª Josep de Andrés, Rafa Armada, Raül Aymí, Adrián Azpiroz, Dolors Buxó, Juan Antonio Cantí, Cam Christie, Remko van Doorn, Fortunato Frías, Martin Goodey, Noelia Herranz, Anna Latorre, Michelle Le Marchant, Rosa Llinàs, Ferran López, Albert Martínez-Vilalta, Isabel Martínez, Rafael Martínez, Anna Motis, Eva Muñoz, Mary and Jim Ramsay, Olga Rius, Jorge Rodríguez Mata, Pedro Rubio, Kawai Sachiko, Aurea Vilalta and Nicole Wirtz. Toni Llobet has yet again provided us with the excellent illustration on the back cover, for which we thank him warmly.

PASSERIFORMES

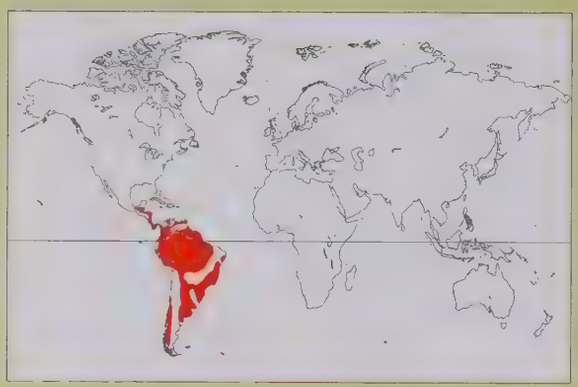
- Eurylaimi
  - Eurylaimidae (Broadbills)
  - Philepittidae (Asities)
  - Pittidae (Pittas)
- Furnarii
  - Furnariidae (Ovenbirds)
  - Dendrocolaptidae (Woodcreepers)
  - Thamnophilidae (Typical Antbirds)
  - Formicariidae (Ground-antbirds)
  - Conopophagidae (Gnateaters)
  - Rhinocryptidae (Tapaculos)
- Tyranni
  - Cotingidae (Cotingas)
  - Pipridae (Manakins)
  - Tyrannidae (Tyrant-flycatchers)
- Acanthisittae
  - Acanthisittidae (New Zealand Wrens)
- Menurae
  - Atrichornithidae (Scrub-birds)
  - Menuridae (Lyrebirds)
- Oscines
  - Alaudidae (Larks)
  - Hirundinidae (Swallows)
  - Motacillidae (Pipits and Wagtails)
  - Campephagidae (Cuckoo-shrikes)
  - Pycnonotidae (Bulbuls)
  - Chloropseidae (Leafbirds)
  - Irenidae (Fairy-bluebirds)
  - Aegithinidae (Ioras)
  - Ptilogonatidae (Silky-flycatchers)
  - Bombycillidae (Waxwings)
  - Hypocoliidae (Hypocolius)
  - Dulidae (Palmchat)
  - Cinclidae (Dippers)
  - Troglodytidae (Wrens)
  - Mimidae (Mockingbirds and Thrashers)
  - Prunellidae (Accentors)
  - Turdidae (Thrushes)
  - Sylviidae (Old World Warblers)
  - Polioptilidae (Gnatcatchers)
  - Muscicapidae (Old World Flycatchers)
  - Platysteiridae (Wattle-eyes)
  - Rhipiduridae (Fantails)
  - Monarchidae (Monarch-flycatchers)
  - Petroicidae (Australasian Robins)
  - Pachycephalidae (Whistlers)
  - Picathartidae (Rockfowl)
  - Timaliidae (Babblers)
  - Pomatostomidae (Pseudo-babblers)
  - ...
  - ...
  - Paradoxornithidae (Parrotbills)
  - Orthonychidae (Logrunner and Chowchilla)
  - Cinclosomatidae (Whipbirds and Quail-thrushes)
  - Aegithalidae (Long-tailed Tits)
  - Maluridae (Fairywrens)
  - Acanthizidae (Thornbills)
  - Epthianuridae (Australian Chats)
  - Neosittidae (Sitellas)
  - Climacteridae (Australasian Treecreepers)
  - Paridae (Tits and Chickadees)
  - Sittidae (Nuthatches)
  - Tichodromadidae (Wallcreeper)
  - Certhiidae (Treecreepers)
  - Rhabdornithidae (Philippine Creepers)
  - Remizidae (Penduline Tits)
  - Paramythiidae (Painted Berrypeckers)
  - Melanocharitidae (Berrypeckers and Longbills)
  - Nectariniidae (Sunbirds)
  - Dicaeidae (Flowerpeckers)
  - Pardalotidae (Pardalotes)
  - Zosteropidae (White-eyes)
  - Promeropidae (Sugarbirds)
  - Meliphagidae (Honeyeaters)
  - Oriolidae (Old World Orioles)
  - Laniidae (True Shrikes)
  - Malaconotidae (Bushshrikes)
  - Prionopidae (Helmetshrikes)
  - Vangidae (Vangas)
  - Dicruridae (Drongos)
  - Callaeatidae (Wattlebirds)
  - Grallinidae (Mud-builders)
  - Corcoracidae (White-winged Chough and Apostlebird)
  - Artamidae (Woodswallows)
  - Pityriaseidae (Bornean Bristlehead)
  - Cracticidae (Butcherbirds)
  - Paradisaeidae (Birds-of-paradise)
  - Ptilonorhynchidae (Bowerbirds)
  - Corvidae (Crows)
  - Sturnidae (Starlings)
  - Passeridae (Old World Sparrows)
  - Ploceidae (Weavers)
  - Estrildidae (Waxbills)
  - Viduidae (Indigobirds)
  - Vireonidae (Vireos)
  - Fringillidae (Finches)
  - Drepanididae (Hawaiian Honeycreepers)
  - Parulidae (New World Warblers)
  - Cardinalidae (Cardinals and allies)
  - Thraupidae (Tanagers)
  - Emberizidae (Buntings and allies)
  - Icteridae (New World Blackbirds)

Class AVES

Order PASSERIFORMES

Suborder TYRANNI

Family COTINGIDAE (COTINGAS)



- Very small to large arboreal birds, extremely varied both in form and in plumage, males of many species with brilliantly coloured or highly ornamental plumage; feed mostly, some species exclusively, on fruit.
- 7·5-51 cm.



- Central and South America, including Trinidad.
- Mostly tropical and subtropical forest, a few species in temperate mountain woodlands.
- 29 genera, 71 species, 108 taxa.
- 16 species threatened; none extinct since 1600.

Systematics

There has for a long time been uncertainty about the composition of the family Cotingidae, as there has also been with the related families of the manakins (Pipridae) and the tyrant-flycatchers (Tyrannidae), and such uncertainty is likely to continue, at least in the near future. Following a number of nineteenth-century anatomical studies, these three families were distinguished from one another on the basis of the shape of the bill and the scutellation of the tarsus, as well as whether or not the toes were united and, if they were, to what extent. It soon became clear, however, that a classification based on these characters contained awkward exceptions. R. Ridgway, in his detailed systematic treatment of the Cotingidae in 1907, omitted bill shape, in particular, from the characters defining the family, as he considered it to be taxonomically uninformative at the family level. By the 1960s, further research into the structure of the skull and syrinx had demonstrated that changes needed to be made to what was then the traditional classification, the most important of these changes being the transfer to the Tyrannidae of several genera contemporarily included in the Cotingidae.

More recent research, with more genera available for study and supplemented by biochemical characters and DNA analyses, has indicated the need for further modifications. The two principal changes concern the three plantcutters (*Phytotoma*) and the monotypic genus *Oxyruncus*. The plantcutters are superficially very different from the "true" cotingas and were for long treated as constituting a small family of uncertain affinities, but it now seems well established that *Phytotoma* is, in fact, closely related, possibly as a sister-group, to a cotingid clade formed by the genera *Ampelion*, *Doliornis* and *Zaratornis*. As a consequence, it has become the standard practice in most recent handbooks for the genus *Phytotoma* to be placed in the Cotingidae. The peculiar and still little-known Sharpbill (*Oxyruncus cristatus*) is more problematic. The anatomical characters that have been studied do not provide clear evidence of its relationships, and the species' unique bill shape is considered phylogenetically uninformative. In some respects, such as the concealed crown patch and the male's modified outermost primary, the Sharpbill resembles the tyrannids, and certain other features, including the structure and musculature of the syrinx, support such a relationship. On the other hand, the general body proportions, the singing behaviour (see Breeding) and the fact that the young are fed by regurgitation point to a relationship with the cotingas. There has, however, been a reluctance to ally the species with the Cotingidae, as its tarsal scutellation is of the type known as exaspidean, which is not found among "definite" cotingids. Because of these conflicting data, the Sharpbill has commonly been placed in its own monotypic family. Nevertheless, DNA analysis suggests, rather surprisingly, an affinity with the cotingid genus *Pipreola*. For the time being, it is probably best to treat the Sharpbill as a cotinga, but the taxon clearly remains in need of further study.



As currently delineated, Cotingidae is made up of assorted genera, some of which are only dubiously included within its boundaries. The diversity of form, plumage and behaviour suggests that the family is a dumping ground for several unrelated lineages derived from tyrannoid ancestors. The ***Sharpbill*** *is a prime example. Long isolated in its own family, Oxyruncidae, it has many unusual features, not least its pointed bill. In its vocalizations and chick provisioning it resembles a cotinga, but its concealed crown patch, its modified first primary, and the structure of its syrinx all point to a link with the tyrant-flycatchers. The results of genetic analyses are inconclusive, so for the time being the Sharpbill is placed within Cotingidae, pending further research.*

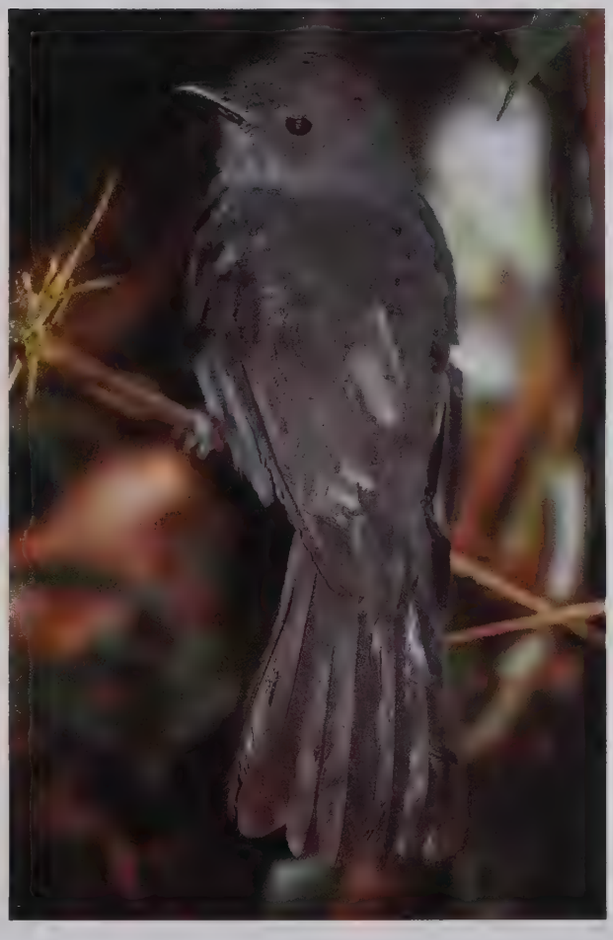
[*Oxyruncus cristatus cristatus*, Rio de Janeiro, Brazil. Photo: Edson Endrigo]



Due to their anomalous morphology, the plantcutters were thought to justify a separate family, Phytotomidae. As new genetic data were analysed, however, it became clear that they were allied to a cotingid clade formed by three Andean genera, Ampelion, Doliornis *and* Zaratornis. *As such, the* ***White-tipped Plantcutter*** *and its congeners are now usually placed within Cotingidae. Their crests are unique in the family, and their distinctive rounded bills have fine serrations along the cutting edge, an adaptation for eating leaves and buds.*

[*Phytotoma rutila rutila*, Salinas Grandes, Argentina. Photo: Gabriel Rojo/ Nature Picture Library]

In its current constitution, the family Cotingidae contains a highly diverse array of genera, the relationships among which are far from clear. Although some authors have attempted to group the genera into several subfamilies, such treatment is considered unhelpful in that it appears to imply too definite a statement with regard to relationships. The sequence in which the genera are presented is, therefore, to a large extent arbitrary, and it is reasonable to suppose that future research will lead to substantial amendments. Indeed, some of the genera may be found to be sufficiently distinct that they merit elevation to family status. The sequence starts with two genera, *Oxyruncus* and *Phytotoma*, which are far from being typical of the family as a whole, and it ends with some of the most strikingly sexually dimorphic genera, which have developed to the highest degree the extravagant courtship and lek displays for which the family is best known. These last comprise the fruitcrows (*Haematoderus*, *Querula*, *Pyroderus*, *Cephalopterus*, *Perissocephalus*), for which there is good evidence that they form a natural group; the bellbirds (*Procnias*), which are almost certainly not closely related to the fruitcrows; and, finally, the red cotingas (*Phoenicircus*) and the cocks-of-the-rock (*Rupicola*), which, according to the findings of recent research, represent a monophyletic group, not closely related to either of the two preceding ones.

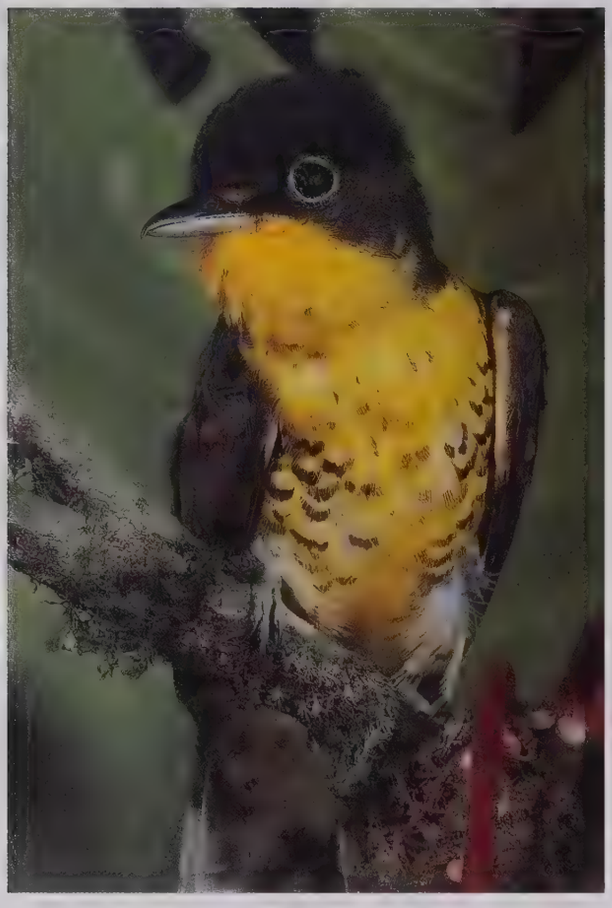


Future research is likely to result in major amendments to the sequence and content of the cotinga family, not least because new species are still being found. The ***Chestnut-capped Piha****, for example, was discovered in 1999 in the Central Andes of Colombia. It belongs to an Andean grouping which also includes the Dusky Piha* (Lipaugus fuscocinereus)*, and the Scimitar-winged Piha* (L. uropygialis)*, all three being relatively inconspicuous inhabitants of the dense cloudforest middle storey. Despite their retiring nature, they are all fairly large and distinctive. Indeed, the fact that such birds are still being unearthed from their remote Andean hideaways suggests that the South American continent still has more surprises in store.*

[*Lipaugus weberi*, Anorí, Antioquía, Colombia. Photo: Andrés M. Cuervo]

Within the family as presently recognized, most genera are extremely distinct. There are, in fact, only two areas of uncertainty. The first concerns the genera *Lipaugus* and *Tijuca*. The above-mentioned research, supported by DNA analysis, indicates that the inclusion of the Grey-tailed Piha (*Snowornis subalaris*) and the Olivaceous Piha (*Snowornis cryptolophus*) in the genus *Lipaugus*, as was the long-standing practice in all standard works, rendered that genus non-monophyletic; these two green-plumaged Andean species are only remotely related to the seven other, mainly grey-plumaged species, and they have recently been placed in a separate, newly erected genus, *Snowornis*. On the other hand, the Scimitar-winged Piha (*Lipaugus uropygialis*), restricted to the Andes of Bolivia and still poorly known, was for long placed in a monotypic genus, *Chirocylla*, a treatment based on its uniquely shaped flight-feathers. In other respects, however, it quite closely resembles two other grey-plumaged Andean species, the Dusky (*Lipaugus fuscocinereus*) and Chestnut-capped Pihas (*Lipaugus weberi*), notably in the modification of the barbs of the middle primaries (see Morphological Aspects), and it is probably more closely related to them than they are to the similarly grey-plumaged Amazonian and east Brazilian Screaming (*Lipaugus vociferans*) and Cinnamon-vented Pihas (*Lipaugus lanioides*). The general consensus among recent authorities in not recognizing *Chirocylla* seems preferable. This example has parallels in the cotingas' sister-family, the Pipridae, in which one species may exhibit strange and striking modifications of the wing or tail feathers that are not found in closely related congeners.

The affinities of the east Brazilian genus *Tijuca*, containing two species with very restricted ranges in the coastal mountains, are still uncertain. Analysis of feather proteins has suggested that the Black-and-gold Cotinga (*Tijuca atra*) and, less markedly, the



Grey-winged Cotinga (*Tijuca condita*) may be quite closely related to one of the *Lipaugus* species, the Screaming Piha, thus putting in doubt the validity of the taxon *Tijuca*.

The second uncertainty regarding generic limits involves *Ampelion*, *Doliornis* and *Zaratornis*. All are rather inactive fruit-eaters of the High Andes, lacking brilliant colours, and possessing a semi-concealed reddish nuchal crest, although this is reduced to a vestigial patch in *Zaratornis*. *Doliornis* has a narrower and less hooked bill than that of *Ampelion*, and differs markedly in its juvenile plumage. *Zaratornis* is the most distinct in plumage, and it differs from *Ampelion* in some details of skull structure. Whether these differences outweigh the similarities and warrant generic status is a matter of largely subjective judgment, and there is disagreement among taxonomists. The most recent opinion is that *Doliornis* and *Zaratornis* merit recognition, and this treatment is therefore maintained, although with reservations.

Whatever the eventual taxonomic treatment of these problematic cases, it is unquestionable that the cotingas, as now recognized, are among the most diverse of passerine families. Indeed, they are perhaps the most diverse of all. They exhibit the widest size range, from the tiny Kinglet Calyptura (*Calyptura cristata*) up to the big, heavy umbrellabirds (*Cephalopterus*), the latter being as large as a crow (Corvidae), and they display an extraordinary diversity of form and of plumage. Thirteen of the 29 genera are monotypic, and six or seven others consist of single "zoogeographical species", defined as closely related forms which replace one another geographically, with no, or minimal, distributional overlap. Furthermore, only in the cases of *Pipreola* and *Cotinga* do two or more congeners regularly occur together in the same area. The diversity of the genera is, indeed, so great that one is forced to wonder whether what is now treated as a family actually consists of a number of lineages that arose independently from the tyrannoid stock at a very early stage of its radiation. If this is so, future research may lead to a classification radically different from that currently adopted.

If the classification of the cotingas at the higher levels remains controversial, at the level of the species there is very general agreement. Some recent authorities have split the Elegant Mourner (*Laniisoma elegans*) into two species, but the two forms, one comprising the nominate race in south-east Brazil and the second consisting of three other subspecies in the Andes, differ rather slightly; both remain little known. A similar instance involves the Swallow-tailed Cotinga (*Phibalura flavirostris*), the recently rediscovered Bolivian subspecies of which differs in a number of characters from the geographically remote nominate race of south-east Brazil and adjacent Paraguay and Argentina. Both cases have consequences affecting conservation priorities (see Status and Conservation).

Morphological Aspects

The extreme diversity of the cotingas has already been stressed (see Systematics). They have the widest size range of all passerine families, the largest species being about 80 times as heavy as the smallest and about six times as large, as measured by both wing length and total length. Thus, the diminutive Kinglet Calyptura, no bigger than 8 cm and, as its vernacular name implies, reminiscent in size and plumage of a kinglet of the mainly Holarctic genus *Regulus*, is dwarfed by the male Amazonian Umbrellabird (*Cephalopterus ornatus*), which, at about 50 cm in length and probably half a kilogram in weight, is the largest Neotropical passerine. The cotingas also vary greatly in body proportions and in bill size and structure, although none has the typical wide, flat bill, with well-developed rictal bristles, that is the main type of bill among the related tyrant-flycatchers. Finally, they vary spectacularly in plumage colour and ornamentation.

Structurally, bill size and shape are most conspicuously diverse. Leaving aside the Sharpbill and the plantcutters, the bills of which are of unique form, three main bill types can be distinguished. Small to medium-sized cotingas, with a main diet of small fruits, tend to have a short bill, moderately hooked at the tip and with a slightly arched culmen; examples are the berryeaters and fruiteaters of the genera *Carpornis* and *Pipreola*. Some of the larger and more specialized frugivores, adapted to feeding on relatively large fruits which, as with all cotingas, they swallow whole, have a short bill, very wide at the gape, as seen in extreme form in the bellbirds (*Procnias*) and in less extreme form in the white-winged cotingas (*Xipholena*). In contrast, the very large cotingas, with diets consisting mainly of large fruits and large insects, have a long, strong, crow-like bill, from which they have long been known as fruitcrows.

The Sharpbill is named after its highly distinctive bill. This is very sharply pointed, with a broader base, and is used as a wedge to pry open rolled leaves in order to extract concealed prey and, similarly, to open dehiscing fruit so as to extract seeds. At the opposite extreme, the plantcutters possess a short, stout,

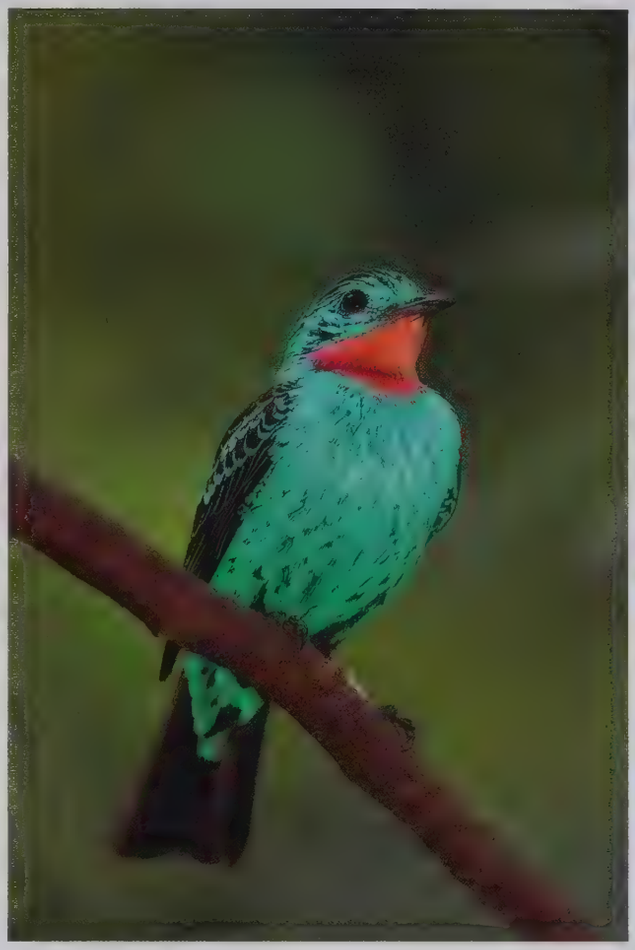
Previously called the Shrike-like Cotinga, the ***Elegant Mourner*** *looks nothing like a shrike, and is quite possibly not a cotinga. Genetic analysis is inconclusive, but suggests links with genera currently treated as piprid, such as* Schiffornis, *or tyrannid, for example* Laniocera. *It is retained in its traditional position, pending further review. Regardless of ancestry, it provides a good example of fluctuations in species-level taxonomy, and the impact this has on conservation priorities. Some authors consider the nominate race to be a separate species, in which case it is classed as Vulnerable, and thus qualifies for conservation funding. If lumped with the Andean races, however, as here, the entire complex is not reckoned to require red-listing at present.*

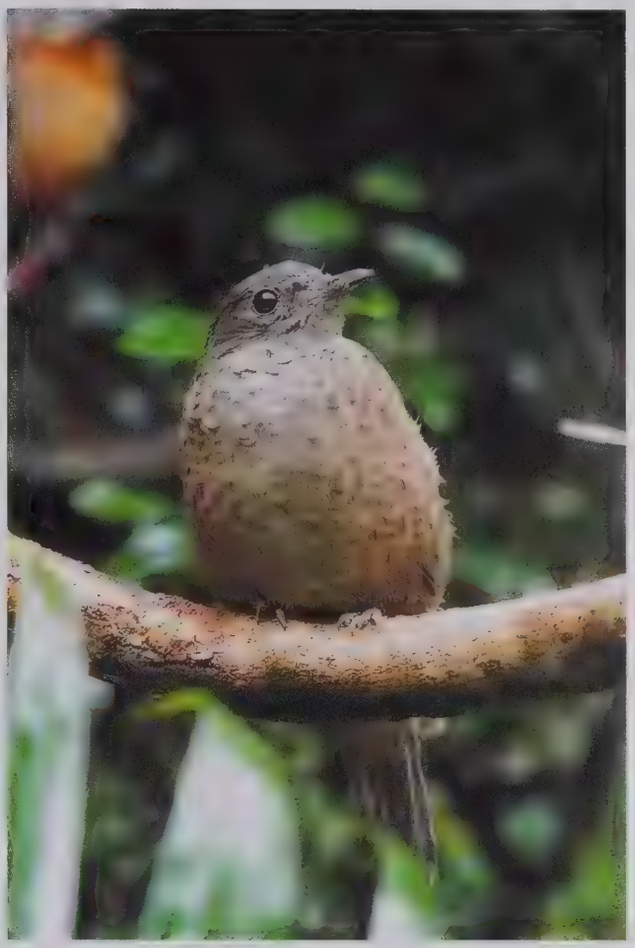
[*Laniisoma elegans buckleyi*,
Ecuador.
Photo: Steven Holt/VIREO]



Until the early 1990s, the ***Chestnut-bellied Cotinga*** *went unnoticed in the highlands of Ecuador, where it is quite widespread but very thinly and patchily distributed. It is a member of a trio of genera, including* Zaratornis *and* Ampelion, *restricted to cloudforest or* Polylepis *forests in the high Andes. There are distinct differences between these genera, but also overlaps in voice, morphology and behaviour. Further research might lead to a merger into a single genus.*

[*Doliornis remseni*,
Ecuador.
Photo: Mark Robbins/
VIREO]





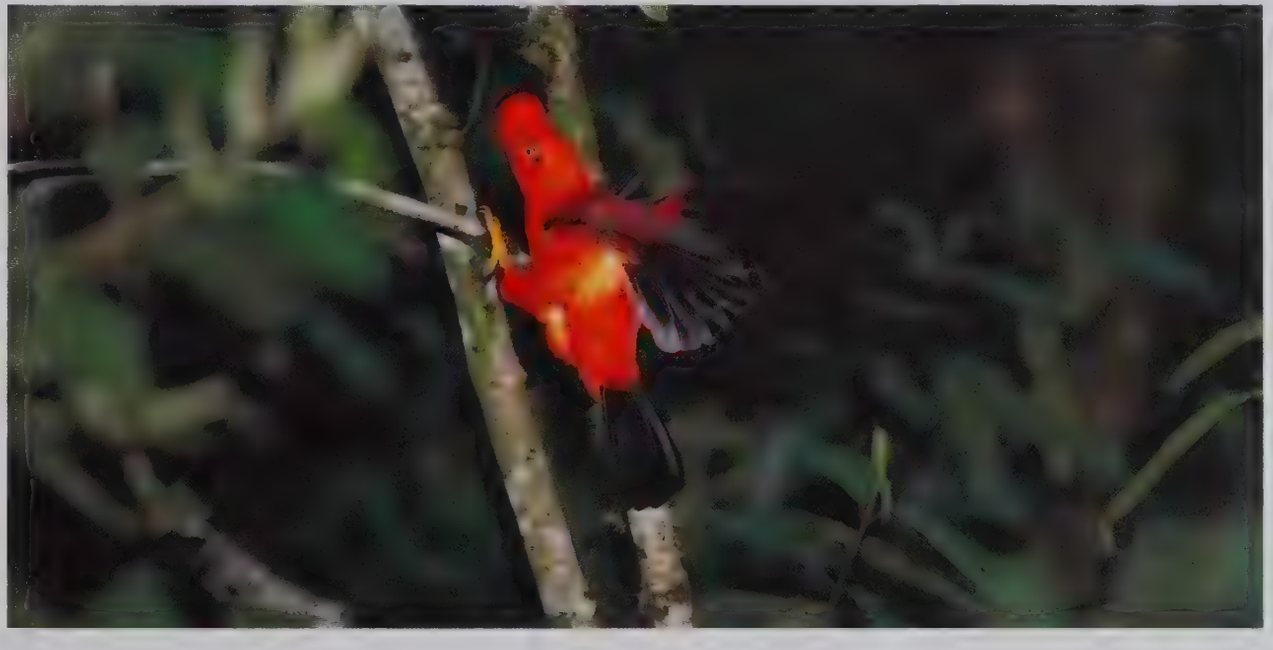
It is difficult to make any sweeping statements about cotingid morphology, so variable are the different genera. Their bills are comparatively diverse, in size and shape, ranging from very short and wide to long, powerful and crow-like. Strong sexual dimorphism is a common theme in many genera, as demonstrated by these ***Spangled Cotingas****, medium-sized members of the family, with rather short, moderately wide bills. Males tend to be flamboyantly colourful, while females are often dull, sometimes with a scaled effect. In cotingids, and passerines in general, the males are usually the larger sex, but in a few species, for reasons as yet unknown, females are slightly larger.*

[*Cotinga cayana*.
Left: Pete Oxford/
Nature Picture Library.

Right: Amazonas, Brazil.
Photo: Fabio Colombini]

conical bill with finely serrated edges, well suited to their herbivorous diet.

There is a good deal of variation in wing and tail lengths in relation to overall size, in most cases clearly associated with general mode of life and feeding method. Thus, the three purpletufts (*Iodopleura*), which feed largely, and for cotingids atypically, by hawking for flying insects from treetops, are very long-winged for their weight. The Purple-throated Fruitcrow (*Querula purpurata*), too, has relatively long wings, but they are also broad. Its conspicuous agility in flight, doubtless dependent on these wing proportions, appears to be an important adaptive character in its unique social organization (see Breeding). Of the species that are relatively short-winged, the two red cotingas (*Phoenicircus*) and the Scaled Fruiteater (*Ampelioides tschudii*) stand out: the former are rather manakin-like in their courtship behaviour and in keeping to the lower forest strata; and the latter is unusual in that it forages by working along more or less horizontal tree branches, rather than by the normal cotingid technique of taking fruit and insects in aerial sallies (see Food and Feeding). The only cotinga with a very long, forked tail, the Swallow-tailed Cotinga, is, like the purpletufts, unusual in its habit of hawking for flying insects, and it is also the most aerial of all the members of the family in its general behaviour.



Cotingas have short legs and, in common with other passerines, their toes are arranged three forwards, one back. This design allows bulky birds, such as the ***Andean Cock-of-the-rock****, a strong grip on a variety of perches. In many species the flight-feathers are curiously modified. The Andean Cock-of-the-rock's slender outer primary is visible in this photograph.*

[*Rupicola peruvianus saturatus*,
Manu National Park and
Biosphere Reserve, Peru.
Photo: Bernard van
Elegem]



*The **Plum-throated Cotinga** belongs to the genus* Cotinga*, from which the family draws its common and scientific names. This is a group of treetop species, which generally keep to the forest canopy. They are usually termed the "blue cotingas", for obvious reasons! The vivid cast of the male's plumage is famous, but his modified primaries are less well known. In this species, the inner webs of the outermost primaries (7-10) are sinuated, and the eighth primary is very slender. In ordinary flight these feathers produce a strange tittering or rattling sound, which is accentuated during display.*

[*Cotinga maynana*, River Napo, Ecuador. Photo: Hans D. Dossenbach]

Curious and striking specializations in the structure of the flight-feathers are a feature of several cotingid genera. In all cases they are fully developed only in adult males, being less pronounced or absent in females and young birds; hence, they almost certainly have some function in male courtship display, but the details of this are still little understood. In the seven species of *Cotinga*, the blue cotingas, adult males in flight make a rattling or tittering sound, undoubtedly produced by the modified outer primaries, but the modifications are conspicuously and puzzlingly different in each species, involving variation in length of the feathers, attenuation to various degrees of the feather tips, and narrowing of the central part of the vane. For example, the adult male Turquoise Cotinga (*Cotinga ridgwayi*) has primaries 9 and 10 thin and short, P9 especially so, and somewhat incurved at the tip, and the outer webs of both P8 and P9 are sinuated near the base; in the male Plum-throated Cotinga (*Cotinga maynana*), however, it is the inner webs of primaries 7-10 that are sinuated, and P8 is very slender. The adult male Spangled Cotinga (*Cotinga cayana*) has primaries 9 and 10 thin and tapering, and slightly recurved, while the outer webs of primaries 6 and 7 have non-interlocking barbs which form a fringe; in addition, the inner secondaries are very long. The two most curious modifications are found in the *Phoenicircus* red cotingas and in the Scimitar-winged Piha. In the former, primary 7 is uniquely modified, being very short and twisted, while in the latter all primaries except the innermost are outwardly curved, pointed, and shortened to different degrees, with P5-8 each progressively shorter than the preceding one, and P9 and P10 much longer. Other genera in which the males exhibit modifications of the flight-feathers to a greater or lesser extent include *Oxyruncus*, *Laniisoma*, *Xipholena*, *Procnias* and *Rupicola*.



The genus Xipholena *is related to* Cotinga*, and likewise contains a set of richly coloured medium-sized canopy species (this **Pompadour Cotinga** has been photographed outside its normal habitat). The dominant colour in the plumage of males is purple, and the group is often referred to as the "purple cotingas". In two species of the trio, the lengthened covert plumes drape luxuriously, offset by the whiteness of the wings. The latter feature is especially conspicuous in flight or during displays. The Pompadour Cotinga is a widespread bird in Amazonia, but it is somewhat tied to lower-stature woodland, especially where this is on sandy soil.*

[*Xipholena punicea*, Venezuela. Photo: Roland Seitre]

Sexual size dimorphism among the cotingas is much as that found in other passerine families. Males are somewhat larger than females, the latter's wing length averaging 93-99% of that of males. Considerably greater differences exist among the umbrellabirds and the bellbirds, the females of which have average wing lengths that are, respectively, 84-89% and 85-89% of those of the males. These are birds with highly developed male ornamentation associated with striking courtship displays (see Breeding); probably in all of them, dominant males defend traditional display and mating perches against other males, so that there may be a strong selective advantage in large size.

In a few genera and species of cotinga, females are slightly larger than males. This is the case with at least one of the blue cotingas, with the Purple-throated Cotinga (*Porphyrolaema porphyrolaema*) and, probably, with the red cotingas. No plausible explanation for this can be suggested, except in the case of



The fruiteaters (Pipreola) *make up the most species-rich genus in the family. Of 11 species, 10 are morphologically homogeneous Andean birds, and one is a divergent form restricted to the tepuis of southern Venezuela. Distinctively, the bills are red or reddish. In terms of plumage, green and yellow are the dominant colours, although males often have black on the head and chest, and red or orange on the throat or breast. Females are much duller. The* ***Green-and-black Fruiteater*** *is the most widespread and numerous member of the genus. It is fairly common in the understorey and subcanopy of moderate-altitude Andean forests from Venezuela to Peru.*

[*Pipreola riefferii occidentalis*, La Planada, Colombia. Photo: Luis Mazariegos]

the red cotingas, whose courtship display is reminiscent of that of some of the manakins, with males engaging in very active and agile flight manoeuvres in the lower forest strata. The blue cotingas are especially puzzling. Females of the Plum-throated Cotinga are on average larger than the males in all measurements, and those of the Turquoise Cotinga exceed the males in most measurements and are considerably heavier; in the Purple-breasted Cotinga (*Cotinga cotinga*) and the Banded Cotinga (*Cotinga maculata*), on the other hand, males are distinctly larger than females. In the three other species of blue cotinga, the males are slightly the larger sex.

Many cotingas exhibit striking differences between the sexes in adult plumage, the males being conspicuously brighter in coloration or having remarkable adornments. Indeed, among passerine birds, only the birds-of-paradise (Paradisaeidae) exceed them in the brilliance and extravagance of the males' plumage. In some cotingids, on the other hand, male and female plumages differ only slightly or not at all. As described later (see Breeding), the male ornamentation is associated with conspicuous, and in many instances quite amazing, displays. In several cases, however, what seem to be equally striking displays are performed by males of species with almost no sexual dimorphism, the Screaming Piha, the Capuchinbird (*Perissocephalus tricolor*) and the Red-ruffed Fruitcrow (*Pyroderus scutatus*) being three such examples.

In the *Cephalopterus* umbrellabirds and the *Procnias* bellbirds, two genera of large or medium-large cotingids, the adult males have the head or neck adorned with wattles or brightly coloured bare skin. The wattles are conspicuously exhibited in display, in two radically different ways. In the case of the umbrellabirds, they are inflated with air. In the White Bellbird (*Procnias albus*), the only one of the three wattle-bearing species of *Procnias* that has so far been studied anatomically, the single wattle is richly vascularized; during display it is extended, rather slowly, apparently by engorgement of the blood vessels, and contracted, more rapidly, probably by emptying of the blood vessels and contraction of longitudinal muscle fibres.

Brilliant plumage is a feature of the adult males of many cotingas. As with the great majority of other birds, carotenoid pigments are responsible for red, orange and yellow colours, while blue is produced by structural modification of the feathers, greens being produced by a combination of pigment and structure. Although birds cannot synthesize carotenoid pigments but, rather, are dependent for them on their diet, fruit in the cotingas' case, they can modify the chemical structure of the pigments once these have been assimilated. In the white-winged cotingas in the genus *Xipholena*, the production of very intense, glossy reds and purples is due to a dark form of red carotenoid pigment combined with structural blue, and modification of the feather structure, the barbs being flattened and lacking barbules.

Habitat

"Humid forest" is a very broad, but accurate, description of the habitat of nearly all members of the family. The species vary greatly, however, in the altitudinal range which they occupy, from tropical lowland forest to high-altitude temperate forest, and in the strata of the forest which they mainly inhabit and utilize for their different activities. Most cotingids occur in lowland forest, and smaller numbers at higher elevations. Thus, up to nine or ten different species may live together in the same general area in Amazonian forest, and up to five or six species may do so in subtropical Andean forest. A few species, in the related genera *Ampelion*, *Doliornis* and *Zaratornis*, live even higher in the Andes, culminating in the very local White-cheeked Cotinga (*Zaratornis stresemanni*), a globally threatened cotingid which



The genus Lipaugus *contains seven species, all of them rather modest in pattern and colour. As a rule, they perch lethargically in the middle storey and would be difficult to find were it not for their loud vocalizations. Two montane taxa were recently removed from* Lipaugus, *and placed in a new genus,* Snowornis. *Interestingly, the Screaming Piha* (Lipaugus vociferans) *of Amazonia is grey, as are two Amazonian mourners of the genera* Laniocera *and* Rhytipterna. *On the other side of the Andes, all three representatives of these genera are rufous, including the* ***Rufous Piha****. Some form of mimicry may be in operation, but how or why remains mysterious.*

[*Lipaugus unirufus castaneotinctus*, Ecuador.
Photo: Doug Wechsler/ VIREO]

is restricted to stunted tree-line forest at up to 4250 m in a small area of Peru. The only species which do not, on a broad definition, qualify as forest birds are the plantcutters, which inhabit open scrub and open woodland, including farmland, and the Swallow-tailed Cotinga of eastern Brazil, which frequents forest edges, semi-open country, and even gardens. Perhaps the most divergent is the Peruvian Plantcutter (*Phytotoma raimondii*), an Endangered species of coastal north-west Peru, which is found in sparse desert scrub and barren coastal dunes, with openly dispersed large bushes, from sea-level up to 550 m.

A few species are found, at least in some areas, mainly or entirely in certain types of lowland forest. Most notably, the Amazonian Umbrellabird, over much of its range, is rather strictly associated with forested river islands and swampy areas along the banks of the larger rivers, although in the far west of the Amazon Basin it occurs in hilly forest along the base of the Andes. The Bare-necked Fruitcrow (*Gymnoderus foetidus*) is also found mainly along the forested shores of rivers and lakes, while the very local Black-faced Cotinga (*Conioptilon mcilhennyi*), known only from a limited area of east Peru and adjacent west Brazil and Bolivia, favours swampy and seasonally inundated forest. In Central America, the Yellow-billed Cotinga (*Carpodectes antoniae*) occurs mainly in coastal mangroves, but also in adjacent mixed forest. It seems likely that, in such cases, habitat choice is at least in part dictated by the availability of certain preferred fruits, but this aspect has not been adequately studied.

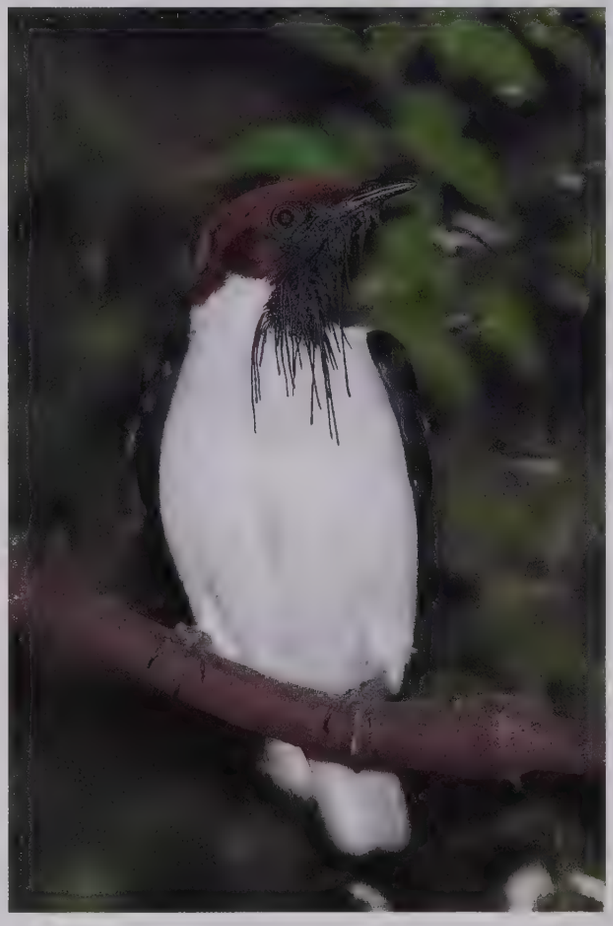
Food and foraging habits, courtship behaviour and, in a few instances, nesting requirements clearly influence habitat choice on a local scale and preferences for different forest strata. Male Bearded Bellbirds (*Procnias averano*), for example, favour high calling posts situated on ridges or slight promontories on the sides of valleys, from which the surrounding slopes can be overlooked, while the forest immediately below a calling post must contain small trees suitable for the later stages of courtship (see Breeding). The two *Rupicola* species have the habit, unique within the family, of attaching the nest to a rock face, and this is the major influence on their choice of habitat. Thus, the Andean Cock-of-the-rock (*Rupicola peruvianus*) is confined to forest along or close to rocky gorges of mountain rivers and streams, and the Guianan Cock-of-the-rock (*Rupicola rupicola*) is restricted to forest in the vicinity of weathered rocky outcrops and caves.

With the exception of those of the cocks-of-the-rock, few cotingid nests have been found. The small number that have been located (see Breeding) indicate that the nests are often sited in isolated trees in more or less open areas adjacent to forest, rather than within closed forest, or, if within forest, in trees standing clear of the surrounding vegetation. This was so, for instance, for the only recorded nests of the Turquoise Cotinga and the Lovely Cotinga (*Cotinga amabilis*), and for all recorded nests of the Bearded Bellbird. For these and probably other cotinga species, therefore, the nesting habitat, on a local scale, is different from the main foraging habitat. Any explanation for this must be tentative, as facts are few, but it seems likely that the choice of isolated trees for nest-sites is an adaptation designed to reduce the risk of predation by arboreal mammals. In the only detailed study of the nesting of the Purple-throated Fruitcrow, it was noted that, when a troupe of capuchin monkeys (*Cebus capucinus*) passed through trees close to the nest, they did not disturb the nest tree, which was in a rather open area of forest and not in contact with the surrounding trees.

An unusual, if minor, aspect of the habitat of the Guianan Cock-of-the-rock is that, locally, the birds themselves may to some extent create their own habitat. Thus, a study of the vegetation of a lek area (see Breeding) in French Guiana showed that the majority of the trees had probably grown from seeds regurgitated or defecated over the years by the displaying males.

General Habits

Thirty-five years ago, A. F. Skutch, at that time by far the most experienced observer of Neotropical birds, wrote of the cotingas as follows. "The cotingas known to me are all birds of the tree-tops.... Some of the species which inhabit the lofty rain forest stay so consistently in the high upper regions inaccessible to man, that one may hear their cries day after day yet hardly ever glimpse the birds themselves. No other family of birds of the Western Hemisphere presents such great obstacles to study; in no other are nests



The bellbirds form a well defined quartet of large, canopy-dwelling cotingas. They are characterized by wholly or largely white plumage, loud chiming or clanging vocalizations and marked sexual dimorphism. They have very wide gapes designed for swallowing large fruit. In particular, they are famed for the bizarre adornments on the heads of the males. The male ***Bearded Bellbird****, for example, has a throat entirely covered in fine wattles. Like his congeners, in the breeding season he calls incessantly from a high, treetop perch. When a female has been attracted, he descends to a low perch in the understorey for the next stage in his pre-mating display.*

[*Procnias averano*, Brazil.
Photo: Roland Seitre]



There is some disagreement as to the correct taxonomic placement of the purpletufts. According to one analysis of morphological features, they belong to an assemblage made up of Laniisoma, Schiffornis, Pachyramphus, Laniocera *and* Xenopsaris *–a motley combination of supposedly tyrannid, piprid and cotingid genera. As no conclusive evidence is forthcoming,* Iodopleura *is retained for the time being in Cotingidae. The purpletufts are the smallest members of the family, and they have by far the longest wings for their weight. Their long primary feathers, easily visible on this* ***Buff-throated Purpletuft****, are directly related to an aerial foraging strategy. They sally for flying insects above the canopy, like miniature Swallow-winged Puffbirds* (Chelidoptera tenebrosa). *Consequently, purpletufts are best found by scanning bare branches protruding from the canopy, or by looking for pairs or small family groups perched high in dead trees. They are by no means solely insectivorous; they also pluck berries from trees, creepers and saplings, often descending to lower growth at forest edges. Their English name derives from the silky tuft at the bend of the wing. Often invisible, this feature is flared prominently during display.*

[*Iodopleura pipra leucopygia*, Boa Nova, Bahia, Brazil. Photo: Edson Endrigo]



Few birds are decked out more strangely than umbrellabirds. The largest passerines in the Americas, they wear a preposterous dangling appendage from the chest, and the bill is shaded by a parasol. When perched and not displaying, the wattle is short, the crest withdrawn, and they look like quiffed crows. On the wing they seem more like giant stumpy woodpeckers with heavy, undulating flight. But when they display, there can be few more eerie or impressive sights than ***Long-wattled Umbrellabirds*** *in heavily forested hills of the Chocó. Silhouetted, with wattles inflated and vastly extended, small groups of males gather on mossy boughs, booming like fog-horns in the misty woods.*

[*Cephalopterus penduliger*, Ecuador.
Photo: Roland Seitre]

more difficult to find, or so hard to reach if they have been located. Yet no family of birds, not even excluding the birds-of-paradise, so excites the wonder and curiosity of the naturalist, so challenges him to pry into the well-guarded secrets of their lives."

Since Skutch wrote those words, in 1969, much more has been discovered with regard to the small number of species that have proved most amenable to study, but a great deal still remains unknown. Little or nothing is known about the behaviour and social organization of many of the Cotingidae. The obvious diversity of their social behaviour has stimulated some detailed research, but this has been mainly confined to the small number of species that perform spectacular courtship displays in groups, generally known as leks (see Breeding).

Few generalizations can be made, but one that seems valid for the family as a whole is that cotingas tend to remain inactive for long periods, almost certainly as a consequence of their predominantly frugivorous diet, which usually allows them to devote a very small part of the day to foraging. Adult males that hold a display area will be present at it for the greater part of the daylight hours. Thus, a male Bearded Bellbird, watched continu-



The genus Ampelion *contains two species, both adapted to life in Andean cloudforests. Both have bright red eyes, and a conspicuous nuchal crest, which can be flared during aggressive interactions or displays. Their "song" is a strange nasal reeling or buzzing note, reminiscent of that of plantcutters* (Phytotoma). *By far the commoner of this duo is the* ***Red-crested Cotinga****, captured here in characteristic pose, perching prominently above cloudforest trees and shrubs.*

[*Ampelion rubrocristatus*, San Miguel, Cochabamba, Bolivia.
Photo: Johannes Ferdinand]



Two strikingly patterned species endemic to the Atlantic Forest of south-east Brazil are known as berryeaters (Carpornis). *The* ***Hooded Berryeater*** *is the commoner, especially at medium elevations in the Serra do Mar. Both species are black on the head, and otherwise mainly olive or yellow. In the colour and pattern of their plumage they are reminiscent of Old World orioles (Oriolidae) or overgrown finches, but their shape and behaviour is distinctly cotingid. Both produce powerful and distinctive songs at regular intervals. They are generally inconspicuous, and were it not for these vocalizations they would be difficult to find.*

[*Carpornis cucullata*, São Miguel Arcanjo, São Paulo, Brazil. Photo: Edson Endrigo]

ously from dawn to dusk, was present in his calling territory for 87% of that period, mainly inactive but calling for 74% of the time during which he was present. The tendency of many cotingids to remain inactive for long periods, whether calling or not, in treetops has made them very difficult to study, as Skutch mentioned, but in recent years observation from canopy-level towers has provided new opportunities for observing some aspects of their behaviour, including spectacular displays never before witnessed by ornithologists. One further generalization that may be made is that, with very few exceptions, notably the Bare-necked Fruitcrow and the plantcutters, cotingids do not form flocks, although several species gather temporarily in small groups at fruiting trees. Individuals of some of the Andean species, however, regularly accompany mixed-species foraging groups.

According to the limited knowledge currently available, the social organization of the cotingids is diverse. Adults of a few species apparently live in conventional pairs, and both sexes attend the nest. This is the case with, in particular, the fruiteaters in the largely Andean genus *Pipreola*, the *Iodopleura* purpletufts, the Black-faced Cotinga and the plantcutters. Some members of the family do not form pairs; the males are polygamous and do not attend the nest. For many others, the mating system is still unknown. The Purple-throated Fruitcrow, however, has a social organization that is quite different from that known for any other cotingid, and reminiscent rather of that of some New World jays (Corvidae). It is highly social, living in small groups of 3-8 individuals which not only move around, forage and roost together, but also jointly attend a single nest. The Purple-throated Fruitcrow is fairly large and, for a cotinga, long-winged and highly agile in flight, and the whole group takes part in defence of the nest.

Various studies and observations have shed light on the displays of some of the Cotingidae, which in many cases exhibit a number of intriguing and, occasionally, unique features. These are discussed later (see Breeding).

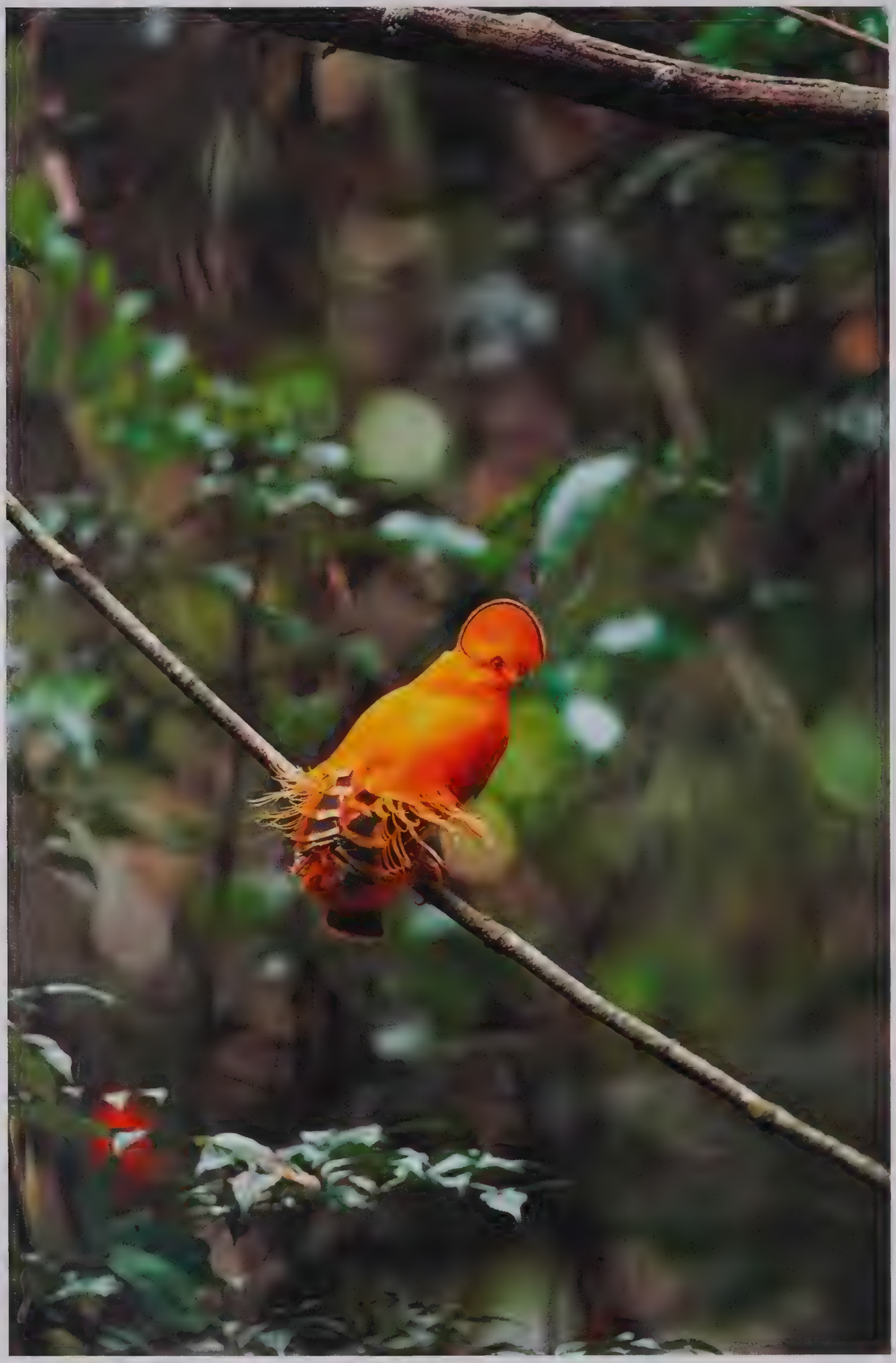
Voice

In voice, as in other respects, Cotingidae is a family of extremes. Male bellbirds make what are probably the loudest of all bird calls, whereas some other species seem to be completely voiceless as they have never been heard to utter any calls. In common with those of the other families of the suboscine passerines, the vocalizations of cotingids are comparatively simple, lacking the complex structure and generally without the musical quality of the songs of the oscines, or "true" songbirds. Most of their calls, and all of the loudest and most striking ones, are associated with the males' displays (see Breeding).

Despite the vernacular name of the genus, only one of the bellbirds, the White Bellbird, has a call that is bell-like. The vocalizations of the other three species are more akin to the sound of a hammer striking an anvil or a hard wooden block. So far-carrying are their calls, across the forested hills and valleys where they have their display grounds, that the birds are heard much more often than they are seen. Each of the species has a distinct repertoire, consisting of a single very loud "bock" or, in the case of the White Bellbird, a double "ding ding", and a succession of one or more kinds of less loud calls. It is worth mentioning a few of the curious or interesting points connected with these birds' extraordinary voices.

A young male Bearded Bellbird, colour-ringed as a nestling, began to practise its calls when it was about 15 months old. Initially, and as with other young bellbirds that have been watched, it was able to make only harsh squawks. After five months of practice the harsh squawk had developed into the adult "bock", but after seven months of further practice the bellbird still had not perfected the repeated call, a less loud "tonk-tonk-tonk...". Similarly, a young male Bare-throated Bellbird (*Procnias nudicollis*), housed in a zoo next to an adult male that called regularly, had not perfected its repeated call after ten months of practice. This long learning process may help to explain the fact that different populations of the same species of bellbird may have very different repertoires. This is especially true of the Three-wattled Bellbird (*Procnias tricarunculatus*), which makes vertical migrations from lowland forest up to montane forest areas physically well separated from one another (see Movements).

The White Bellbird's double "ding ding" is unusual in another way. It may be uttered with the head and body held still, or, in its loudest form, with a swing from right to left. In the latter instance, one "ding" is given as the bird leans to the right and the



On account of their remarkable morphology and their habit of nesting on rocks rather than trees, the cocks-of-the-rock were previously granted their own family. Their vibrant orange plumage, strange fan-like crests and conspicuous leks call to mind some birds-of-paradise (Paradisaeidae) from the island of New Guinea. Although in colour, crest-shape and nesting behaviour they are unique amongst South American birds, they also possess various features typical of cotingas and as such they are now usually subsumed within the Cotingidae.
The Andean Cock-of-the-rock (Rupicola peruvianus) *is widespread in the Andean chain from Venezuela to Bolivia, while the* ***Guianan Cock-of-the-rock*** *occurs in the continent's north-eastern region, in forests of the Guianan Shield. Both of these species inhabit the lower and middle strata of forests, where they are often quite shy away from leks. As might be expected, their gaudy plumes have attracted attention for centuries, appearing in the ornaments and apparel of tribespeople and aristocracy alike. Along with the great macaws,* Ara *and* Anodorhynchus, *and the Toco Toucan (*Ramphastos toco*), they are the most famous of Neotropical birds, emblematic of the South American avifauna in all its richness and idiosyncrasy.*

[*Rupicola rupicola*, French Guiana. Photo: Cyril Ruoso/Bios]



On the basis of several features, the genus Phoenicircus *seems to form a link between two sister-families, Cotingidae and Pipridae. In their short wings and tail, intense carotenoid-rich plumage, and foot structure, red cotingas look like giant manakins. Similarly, their displays involve acrobatic flights and dual sound production, both mechanical and vocal. They resemble manakins in their ecology, eating berries and forming leks in the lower strata, but differ from them in being very thinly spread in apparently ideal habitat. Searching for the* ***Black-necked Red Cotinga*** *in Amazonia can be a time-consuming process, but the prize of a male in adult plumage is well worth the effort!*

[*Phoenicircus nigricollis*, River Amazon, Peru. Photo: Michael & Patricia Fogden]

second one is delivered with a rapid swing of the head and body to the left. The wattle, greatly elongated during calling and display, typically hangs on the right-hand side of the bill when the call is made with a swing, so that it flies out behind the widely opened bill as the head swings to the left. Occasionally, the wattle gets to the "wrong" side; when this happens, the bird manoeuvres it back to the right side before making the call. In southern Guyana, where B. K. Snow carried out the only careful study yet made of the White Bellbird, several individuals were watched, and all were "right-wattled". It is worth noting, however, a series of photographs that show that the recently discovered population of the Serra dos Carajás, in south-east Pará, may be "left-wattled", at any rate to some extent.

A final point relating to the bellbirds' explosively loud calls concerns the way in which they are produced. It has been known since the eighteenth century that the production of sound by a bird's vocal organ, the syrinx, depends on air pressure in the interclavicular air-sacs that surround that organ, and more recent research has demonstrated that loud calls, with energy distributed over a wide frequency range, as is the case with the bellbird's calls, must be associated with high pressure in the surrounding air-sacs. It is therefore of interest that a bellbird's loudest calls are preceded by sudden inhalations of air, as vividly described by J. J. Quelch in an early account of a captive White Bellbird.

> "When the appendage [the wattle] is fully elongated, the bird suddenly inflates its lungs, right and left, by inhaling – almost by a swallowing action – two great draughts of air; but the method by which this is done depends upon which of its two characteristic notes it intends to utter. When the notes 'Kong-Kay' [here transcribed as 'ding ding'] are uttered, the action of inflation has been performed by two distinct inhalations of air, one with the head turned to the right and the other immediately after to the left. At the moment of utterance of the notes, the head is turned to the right for the 'Kong', and then suddenly – so suddenly that it almost startles the observer – the head is swung round to the left for the 'Kay', which is issued with a strikingly loud, piercing and metallic ring or clang – so loud and shrill indeed that, if the observer is close by, the ears are actually deafened for the moment by the sharpness of the sound."

It should be noted that the captive individual described by Quelch, in the late nineteenth century, was "right-wattled", just as virtually all of those more recently observed.

Among other very striking cotinga calls are the booming notes of the umbrellabirds and the Red-ruffed Fruitcrow. All observations indicate that these vocalizations are preceded by inflation of the air-sacs in the anterior part of the body. This involves the conspicuous inflation of the bare red-skinned wattle of the Bare-necked Umbrellabird (*Cephalopterus glabricollis*) and the puffing-out of the Red-ruffed Fruitcrow's feathered throat into a red balloon, and it seems that the calls produced acquire their resonant booming quality from the air in these sacs and, probably, in the buccal cavity. In sharp distinction from the bellbirds, which give their loudest calls with the bill held open to its fullest extent, these fruitcrows keep the bill closed.

"Thus, also in the forest," wrote E. F. im Thurm in 1883, in *Among the Indians of Guiana*, "is heard an extraordinarily deep sound, like the lowing of an ox, and it is long before the traveller realizes the fact that it is made by the 'quow' or 'calf-bird'." This strange call, which male Capuchinbirds utter at their leks (see Breeding), is very different in quality from the umbrellabirds' boom. It begins gradually and is long drawn-out, and it is evidently more conventionally produced. There is no visible inflation of air-sacs, and the call is given with the bill open.

Probably the best-known cotinga call, heard by millions as it is frequently used as a background sound in television programmes and films dealing with South American natural history and travel, is the piercing "pi pi y-o" of the Screaming Piha.



*The **Scaled Fruiteater** is an odd bird with short wings, scalloped plumage and a raptor-like song. The female, pictured here, is more strikingly patterned below than the male, whose underparts are scalloped olive, not black. The male, however, has a much more striking head pattern, including a glossy black crown. This individual has been feasting on palm fruit, but the species often moves along horizontal boughs in the middle storey, snatching large insects and other food items, sometimes during short aerial sallies to adjacent branches and foliage. Perhaps rather oddly, it also eats arboreal snails, beating them against branches to remove part of the shell.*

[*Ampelioides tschudii*, Ecuador. Photo: Greg Dean]

This is uttered by the dull-plumaged males while they are perched inconspicuously in loose groups in the middle storey of the forest, so that the callers themselves can often be difficult to detect. The call is preceded by two much less loud notes, somewhat like those of a dove (Columbidae), "groo, groo", which are probably accompanied by inhalation of air; the bird then suddenly jerks its head back, so that it almost rests on its scapulars, and utters the first syllable with the bill widely open, displaying the orange mouth; it then makes a second backward jerk for the second syllable, before relaxing forward and half-closing the bill for the final "y-o". The quite violent and ritualized movements accompanying the vocalization give the impression of being physically essential to its production, but they are probably really a visual display, as the bird occasionally makes another equally loud call without any movement of the head or body.

Limitations of space prevent a comprehensive treatment, but no account of cotinga voices can omit the remarkable chorus of the Black-and-gold Cotinga. This species' call is an extremely pure whistle lasting about 3 seconds, and the interval between successive calls is approximately 2 seconds. Groups of males call in chorus, timing their calls in such a way that even just two males vocalizing together can produce continuous sound. The pure whistling, sometimes continuous for minutes on end, is an unforgettable sound of the steep wooded mountains in this cotinga's very limited range in south-east Brazil.

The song of the male Sharpbill is exceptionally distinctive. It is an extremely firm sharp whistle, lasting 1-3 seconds. The whistle starts at a frequency of about 3 kHz and descends over a wide interval, from a fourth to as much as a full octave; it has been likened to the sound made by a falling bomb, but without the terminal "boom". While singing, the male stretches his neck forwards and fluffs out the neck feathers, but does not expose his red crest. This contrasts with the mechanical-sounding rasp emitted by the plantcutters, which is similar to the sound produced by the winding of an old-fashioned alarm clock.

Some cotingids are so silent that it has been supposed that they are voiceless. This is so for nearly all of the blue cotingas and also for the Bare-necked Fruitcrow, and few or no vocalizations have been recorded for a number of others. In some genera in which the males are conspicuously vocal, the females seem to be voiceless; the best-authenticated case is that of the Bearded Bellbird. Caution is needed, however, for any species if its nesting behaviour has not been studied. For example, Skutch recorded that a female Lovely Cotinga, hitherto thought to be voiceless, uttered loud screaming calls when mobbing a toucanet (Ramphastidae) that perched near her nest, and later, when he was searching for a nestling which had fallen from the nest, she constantly uttered a low "ic, ic, ic". On the other hand, a female Bearded Bellbird remained quite silent, perched nearby, when a



*The **Crimson Fruitcrow** is a large canopy-dwelling cotinga for which a separate genus is required. It shares some features with the white-winged cotingas of the genus* Xipholena, *but its taxonomic relationships are unclear. The male is mostly glossy crimson, with a heavy reddish bill. In females, like this individual, the bill is blacker, the head and underparts rosy, and the plumage otherwise dusky brown. Flight is heavy and undulating, like an umbrellabird* (Cephalopterus), *but the male performs a unique display. He climbs 30 m above the canopy then parachutes down to a tree-top perch, sometimes spiralling, with feathers puffed out and wing and tail fanned.*

[*Haematoderus militaris*, San Diego Zoo, USA. Photo: Josep del Hoyo/ Lynx Edicions]



*Another bizarre species is the **Bare-necked Fruitcrow**. Within the context of the cotingas, the wrinkled facial skin is unique, and large powder-down patches on the flanks almost so. Although this species is numerous around Amazonian wetlands and rivers, little is known about its social organization except that it regularly forms flocks. Parties of individuals are most likely to be seen in sustained flight, high above the canopy, as they pass from one food source to another, at least one of which is liable to be a* Cecropia *tree full of ripe fruit. These "catkins" (pictured here) are a favourite food of a variety of cotingids, as well as of other frugivores.*

[*Gymnoderus foetidus*, Amazonas, Brazil. Photo: Luiz Claudio Marigo]

chick was periodically taken from the nest, examined and photographed. The single nestling, too, was silent throughout its time in the nest, and it seems likely that this is the case for at least some other cotingas, the entire nesting strategy of which is based on the need to be inconspicuous.

As mentioned above (see Morphological Aspects), the males of several cotingid species produce mechanical wing noises in flight, mainly in the course of courtship display. In the case of the Black-necked Red (*Phoenicircus nigricollis*) and the Guianan Red Cotingas (*Phoenicircus carnifex*), this noise is combined with a vocal call, a phenomenon apparently unique within the family; as the displaying birds fly between perches, they produce a two-part mechanical whistling sound, apparently with the highly modified 7th primary (see Morphological Aspects), followed immediately by a vocal whistle. The two red cotingas are very little known, and only the Guianan species has been occasionally heard also to make a loud, two-part buzzing sound during a short upward flight. The wing noises made in flight by male blue cotingas in the genus *Cotinga* are better known, but their significance is still uncertain. They are usually described as rattling, whirring or whistling sounds, and they apparently differ among the various species in the genus, as do the modifications of the outer primaries. The sound is made in normal flight, but more loudly in display, as is typified by the Plum-throated Cotinga.

The most remarkable of the mechanical wing noises made by a cotinga is that recently described for the hitherto poorly known Dusky Piha of the Andes. The male takes off from a high tree perch and descends steeply towards the ground, making a series of loud, low-frequency sounds as it momentarily opens the wings, umbrella-like, as if trying to slow its fall, and then closes them again, performing this wing action up to twelve times. It then flies up to another perch in an adjacent tree. The sound, described as "almost deafening" at a distance of 10 m, is produced during the sudden opening of the wings. The sequence of sounds resembles that made by the flight-feathers of the much larger and better-known Sickle-winged Guan (*Chamaepetes goudotii*), and was identified as such by local people. It is remarkable that the structural modification responsible for the sound is restricted to the middle part of the outer webs of three primaries, the barbs of which are elongated, stiffened and non-interlocking.



*The cotinga family contains more than its fair share of large and spectacular species. The **Red-ruffed Fruitcrow**, which certainly fits this category, seems most closely related to the umbrellabirds, but unlike them it rarely flies across wide clearings. Males gather in typical leks (rarely found), where they produce deep booming calls and puff out their throats into bright red balloons. This species is quite rare throughout much of its range, except in the Atlantic Forest of south-east Brazil, where the nominate race is relatively common. It seems likely that its population is denser in this particular forest block because of a lack of direct competitors.*

[*Pyroderus scutatus occidentalis*, near Otún-Quimbaya Fauna and Flora Sanctuary, Risaralda, Colombia. Photo: Otto Pfister]

Food and Feeding

Except for the atypical plantcutters, which are adapted for leaf-eating and bud-eating, the cotingas feed mainly on fruit, some apparently exclusively so. In the Neotropical forests, the large cotingids, together with the toucans (Ramphastidae), are the main



*The **Handsome Fruiteater** is virtually restricted to humid forest, and in this respect is typical of almost all members of the family. It ranges from the middle storey to the subcanopy, looking for the fruits on which it mainly subsists, sometimes joining mixed-species flocks. This cotinga is common in the coastal ranges of Venezuela where it occurs between 800 m and 2200 m.*

[*Pipreola formosa*, Venezuela.
Photo: Neil Bowman/FLPA]

avian dispersers of the seeds of large trees bearing fleshy fruits; they digest the fruit pulp, thereafter regurgitating large seeds and defecating small ones. This distinguishes them from the other important family of large frugivores, the parrots (Psittacidae), which digest the seeds, usually rejecting the pulp, and thus play a very different ecological role, that of seed-predators rather than seed-dispersers.

The exception to this general rule is the three plantcutters. Although they do consume fruits, they feed primarily on buds, shoots and leaves, as well as on grasses and flowers. The Rufous-tailed Plantcutter (*Phytotoma rara*) is known also to take insects to a minor degree, and the same probably applies to the other two species.

Two plant families are very important in that their abundant and easily accessible fruits are eaten by almost all frugivores, both large and small. These are the Cecropiaceae, containing the genus *Cecropia* (formerly placed in Moraceae), and the Araliaceae, especially the species *Didymopanax morototoni*. Apart from these, the recorded spectrum of fruits eaten by cotingas varies according to the size of the bird, and reveals that some cotingids have marked preferences for particular kinds of fruit.

The more thorough studies that have been carried out show that each species, even within limited areas, exploits a wide range of fruits, a small number of which are of greatest importance. For example, a detailed study of the Guianan Cock-of-the-rock at one locality during a period of just one month revealed that the birds took at least 65 species of fruit belonging to 31 plant families; of these, however, the Annonaceae, palms (Arecaceae), the incense family (Burseraceae) and the laurel family (Lauraceae) were clearly the most important. A study of the Bearded Bellbird in a small area in Trinidad showed that the species ate at least 41 different kinds of fruit from 20 different plant families, of which the Lauraceae was by far the most significant, followed by the Burseraceae and the Melastomataceae. Other studies, focused on the two cock-of-the-rock species and on the large fruitcrows, confirm the importance of the palm, incense and laurel families, and in addition the nutmeg family (Myristicaceae), all of which have very nutritious pulp or arils, rich in proteins and fats.

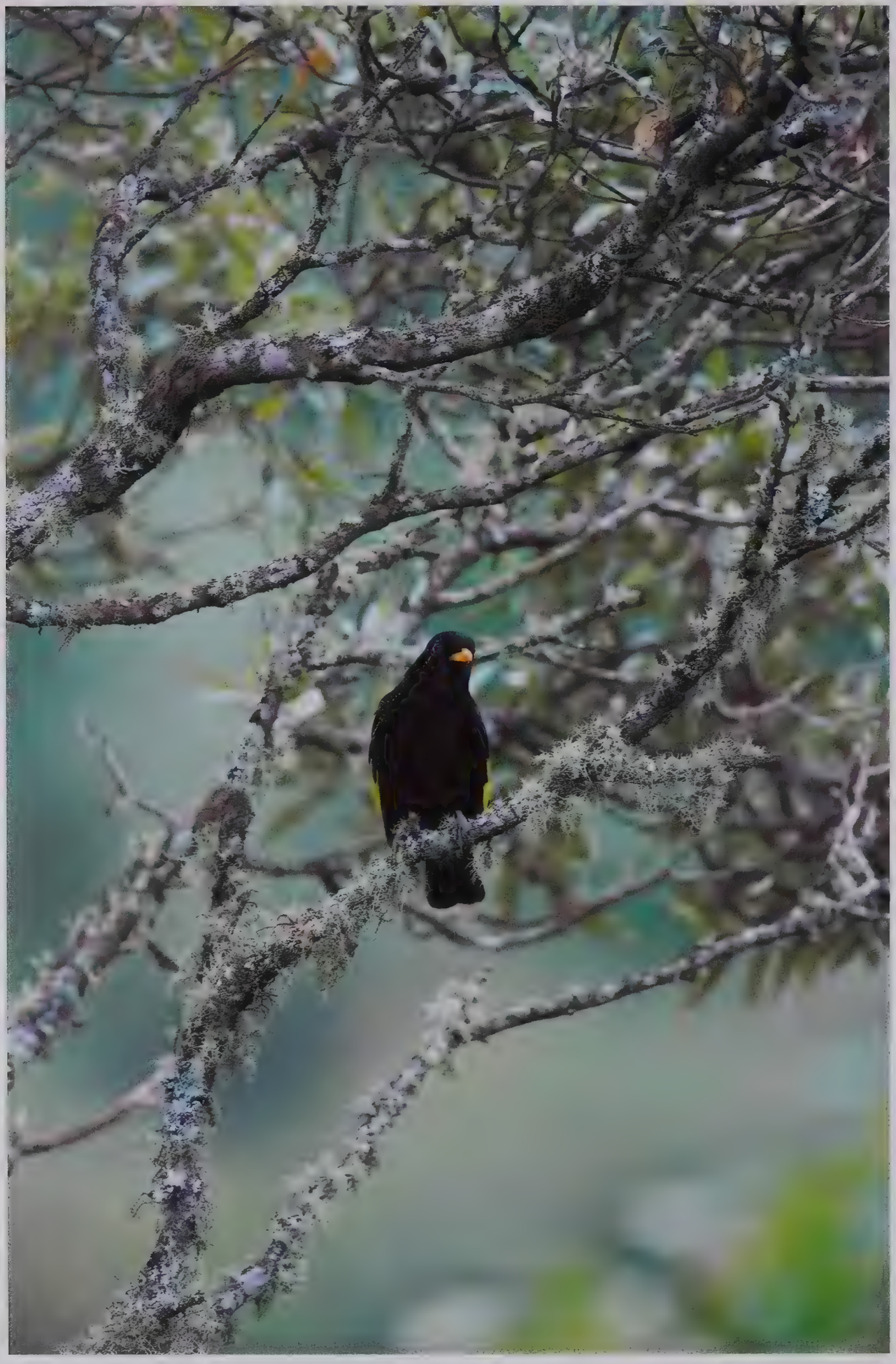
Knowledge of the diets of the medium-sized blue, white-winged and white cotingas is much more fragmentary. This is because these are highly mobile birds, and they have no traditional display perches below which regurgitated or defecated seeds can be collected. For the blue cotingas, it seems that, in some areas, figs (*Ficus*) are an important component in the diet, as also are the fruits of small palms (especially *Euterpe*), laurels and mistletoes (Loranthaceae). On the upper Amazon, Plum-throated and Spangled Cotingas have been recorded as flying daily for considerable distances in order to feed on the large fruits of a *Psittacanthus* mistletoe growing on an isolated tree. Just able to swallow these fruits, which were 25 mm long and 16 mm in diameter, they regurgitated the single sticky seeds, wiping them off on the branches on which they perched and leaving them hanging there. The birds' behaviour was no doubt responsible for this particular tree being loaded with mistletoe plants, while other trees in the neighbourhood had none.

Smaller mistletoe berries are an important component of the diets of the purpletufts and the high-Andean cotingas. Indeed, one of the most striking cases of mutual dependence between bird and plant is that of the White-cheeked Cotinga and two mistletoe species in the Peruvian Andes. In the few areas where they have been carefully studied, in scattered *Polylepis* woodland above 3000 m, these cotingas of very restricted range fed only on fruits of the two mistletoes, of the genera *Tristerix* and *Ligaria*, which were the only fruit-producing plants present at this altitude. After feeding, they would fly to another perch in a *Polylepis* tree and regurgitate the seeds, wiping them off on to the surface of a limb. Examination of the trees revealed many seeds, a few in various stages of germination. Even more re-



Like most other cotingids, cocks-of-the-rock occur in humid forests, but their distribution is constrained by specialized nesting habits. They are reliant on cliff faces and other sheer walls of rock for their nest-sites, and thus the ***Andean Cock-of-the-rock*** *tends to occur in gulleys and ravines in mountainous regions, wherever bare outcrops of rock can be found. Despite their striking plumage, they tend to be quite retiring. In normal circumstances they are most commonly noticed when a ball of glowing orange or red slips through the forest out of sight, or swoops across a gap such as a road, or a river. At some localities they are common birds, even where forest is fragmented. In such places, they can be seen at forest borders, even perching on fence posts and in isolated trees.*

[*Rupicola peruvianus saturatus*, Peru. Photo: Patricio Robles Gil/ Sierra Madre]



A beautiful black and yellow bird lives high in the Serras of south-east Brazil, where it is easy to hear, but difficult to see. In colour and pattern it is reminiscent of a cacique (Cacicus)*, but its bill and behaviour are distinctly cotingid. The* ***Black-and-gold Cotinga*** *lives in the canopy of cloudforest, often concealed in the dense crowns of stunted trees, but at other times emerging to perch prominently on bare boughs. Its true abundance is only revealed by the distinctive song of males, one of the characteristic sounds of montane forest in the states of São Paulo and Rio de Janeiro. Two or more males regularly perch and emit their pure-tone whistles concurrently. Each bird pauses for a couple of seconds between songs, but when two or more males sing at once the pauses of one bird are typically overlain by the songs of another. The effect is a strange meandering ventriloquial note, a bit like the singing of old-fashioned kettles. The affinities of* Tijuca *are unclear. Analysis of feather proteins suggests a link with* Lipaugus*, but the two genera should probably be kept separate on account of their quite different plumage and voice.*

[*Tijuca atra*,
Pico dos Marins,
São Paulo, Brazil.
Photo: Edson Endrigo]



The only non-forest members of the family are the plantcutters (Phytotoma). *All three members of this genus are birds of relatively open habitats, such as low-stature dry forests and bushy country. The* ***Rufous-tailed Plantcutter****, for example, lives in farmland, hedgerows, gardens, and patches of thorny scrub. It is seen here in Los Glaciares National Park, with the famed parapet of Cerro Torre in the background. It ranges far further south than any other cotingid, even occurring on Tierra del Fuego.*

[*Phytotoma rara*, Los Glaciares National Park, Santa Cruz, Argentina. Photo: José & Adriana Calo]

markably, members of a mated pair were seen to engage in mutual display, facing and close to one another, in the course of which both partners regurgitated mistletoe seeds on to the surface of the *Polylepis* branch. It is of interest that a White-cheeked Cotinga, watched recently in the Cordillera Blanca, in the north of the species' range, was seen to eat the buds of a shrub identified as *Berberis lutea*; further study is required in order to establish whether this is a regular habit.

An important point, but one that is difficult to settle, is the question of whether any of the Cotingidae are exclusively frugivorous. Perhaps the best candidates are the bellbirds. Systematic observations of adult bellbirds indicate that they feed entirely on fruit, and at the only successful nest that has been recorded the nestling was also fed solely on fruit. There is, however, an old record of snails being found in the stomach of a Bare-throated Bellbird, and it may be that egg-laying females supplement in this way what might otherwise be a calcium-poor diet; unfortunately, the sex of the individual concerned was not recorded. In this context, the Scaled Fruiteater has recently been observed to eat arboreal snails of the genus *Plekokeilas*, apparently regularly, in north-west Ecuador, but in this case, most interestingly, both sexes consumed the molluscs, which they beat against a branch in order to remove the outer lip of the aperture, and then swallowed whole. A male was seen to capture a snail by plucking it from the underside of a tree branch in an upward sally from a lower perch. The *Phoenicircus* red cotingas and the Andean fruiteaters of the genus *Pipreola* appear, so far as records go, to be entirely frugivorous, but the possibility remains that, as with so many cotingas and other birds, they occasionally exploit the aerial swarms of winged termites (Isoptera) or ants (Hymenoptera). This has recently been documented for Spangled Cotingas and Pompadour Cotingas (*Xipholena punicea*), both of which were previously thought to be exclusively frugivorous.

Apart from the above-mentioned examples of snail-eating, it seems that insects and, in the case of some of the large cotingid species, small vertebrates form the non-fruit part of the diets of the family. Insects are usually taken in short aerial sallies or plucked in flight from foliage or branches. An exception is the Scaled Fruiteater, a short-winged species, which has been described as hopping along horizontal branches in search of insects. Likewise, the Sharpbill, when catching arthropods, may hop along high branches, probing into tufts of moss or epiphytes; it can also move with great agility among the leaves of the outermost twigs of the canopy, often hanging upside-down and making rapid pecks into the bases of leaf clusters.

The fruitcrows, to judge from the small number of nests observed, feed their young mainly with insects, supplemented by an increasing amount of fruit in the later stages and, in the case of the Capuchinbird, an occasional small lizard. The two cocks-of-the-rock, although of fruitcrow size, differ from them in that they feed their nestlings not only with fruit, but also with significant quantities of small vertebrates, mainly lizards and frogs; at some nests, the young may be fed almost entirely with vertebrates. In addition, there is a single record of a Screaming Piha eating an *Anolis* lizard, and one of a Capuchinbird taking a small bat (Chiroptera) from thick foliage and, after battering it against a liana, flying off with it, presumably to feed it to its young.

A final point, of theoretical interest, concerns the question whether, or to what extent, the cotingids and their fruit plants have co-evolved. Some of those cotingas with a short bill and a very wide gape, of which the bellbirds are the most extreme, are clearly adapted to feeding on fruits that are very large in relation to their own body size. They are also able to get rid of large seeds, which are, from the birds' point of view, useless "ballast", by regurgitation after only a few minutes. The most important plant families which they exploit, especially the laurel, palm and incense families, have fruits with pulp rich in fats and proteins, as well as carbohydrates, and seeds which do not adhere to the surrounding pulp, thus facilitating rapid regurgitation; in most cases, they also present their fruits in a manner that makes them accessible to a sallying bird. These and other facts all suggest a long process of co-evolution between plants and avian frugivores. Nevertheless, apart from the above-mentioned example of White-cheeked Cotingas and two mistletoe species in an extreme, marginal environment, there is no known case of a cotingid being dependent on one, or even a few, plant species, or of a plant being dependent for its dispersal on a single cotinga species. Furthermore, the evidence from paleobotany indicates that plant evolution has been much slower than avian evolution, and that fruits very similar to those observed today were in existence long before the evolution of recent bird species. It seems probable, therefore, that the cotingas have become adapted to fruits the characters of which are the result of a very long process of selection by successive avifaunas.

Although the great majority of cotingids appear to forage solitarily or in pairs, the plantcutters often feed in small groups or, occasionally, in large flocks. Indeed, flocks of White-tipped Plantcutters (*Phytotoma rutila*) containing up to 100 individuals have been recorded. The plantcutters differ further from the majority of the other members of the family in that they do not make



Due to their frugivory, cotingids spend a relatively small proportion of their time foraging: it is much easier to fill up on static fruit than to hunt mobile insects. Given an abundance of spare time, they spend hours on end singing during the reproductive period, or loafing and preening at other seasons. This ***Bare-throated Bellbird*** *is taking advantage of an easy schedule by arranging the feathers on its chest. Allopreening has not been reported in the family, and the same goes for "sun-bathing". Nonetheless, this latter behavioural trait might well take place on top of the canopy, where cotingas are especially difficult to observe.*

[*Procnias nudicollis*, Misiones, Argentina. Photo: José & Adriana Calo]

aerial sallies to obtain their food; instead, they feed while perched in shrubs and trees, and they also forage at times on the ground. Bearing in mind the largely herbivorous diet of the plantcutters, these differences are hardly surprising.

Breeding

Knowledge of the breeding of the Cotingidae is still fragmentary. The nests of eight of the genera, and of 33 of the 71 species, are unknown. No quantitative data are available for any species except, to a limited extent, the Guianan Cock-of-the-rock, the unusual nest-site of which makes its nests comparatively easy to find and reach.

Indirect evidence of breeding seasons is more easily obtained by examining the dates of museum specimens which are undergoing a full moult, including that of the flight-feathers and tail feathers. Even so, although the full moult of adult birds generally takes place immediately after the end of a breeding season, the males of some of the highly dimorphic cotingas begin the moult well in advance of the females, so that only the latter sex can be used to indicate the breeding season. Moreover, the information so gained does not reveal when breeding began. With these caveats borne in mind, the moult data combined with available nesting data indicate that, north of about 8° N, the main breeding season of cotingids, as that of most other Neotropical landbirds, is from about March to June, with a peak in April or May, while that in lowland areas south of about 15° S is generally from about September to December; in intermediate lowland areas, and over a wider latitudinal extent in the Andes, breeding shows no clear seasonal pattern. From the little evidence available, the Buff-throated Purpletuft (*Iodopleura pipra*) in south-east Brazil is a notable exception. This globally threatened species breeds in the middle of the austral winter, with egg-laying recorded in July, although a singing male has also been observed in December.

Adults of a few cotingid species, in particular the *Pipreola* fruiteaters, the purpletufts, the Black-faced Cotinga and the plantcutters, apparently live in pairs, and both sexes attend the nest. Those of some others do not form pairs, and the males are polygamous, either actually or potentially, depending on their social status; they display in groups and, for the few species studied, one or a small number of dominant males perform all matings. In these cases, females alone attend the nest. For many other cotingids, although there is often at least some evidence that only the female attends the nest, the mating system remains unknown. This is the case for the treetop-inhabiting blue cotingas in the genus *Cotinga*, the white-winged cotingas in *Xipholena* and the white cotingas in *Carpodectes*. One major exception is provided by the Purple-throated Fruitcrow, the males and females of which live together in small, tightly knit social groups containing up to eight individuals. Thus, the diversity of social organization within the Cotingidae is great, and the following paragraphs are necessarily selective, rather than being a comprehensive account of what is known.

The Guianan Cock-of-the-rock is unique among the family in that groups of males display on the ground and are often highly conspicuous. For this reason, in addition to the fact that its nests are comparatively easy to find, far more is known about this species than about any other member of the family, thanks mainly to a lengthy study by P. W. Trail in Surinam. Up to 50 or more adult males, aged three years or older, may be established at a lek, the site of which may remain unchanged for years. Each male has its own "court" on the forest floor, but spends much of its time in the low branches of trees just above, defending the surrounding perches up to a height of 1-2 m, and engaging in regular bouts of aggressive display with its neighbours, accompanied by much raucous crowing. On the arrival of a female, or females, in the trees above, all males present at once fly down to their courts, where they land with a bounce and flutter, which effectively blows away all debris and keeps the courts clear and smooth; they then crouch motionless and silent, with the upper plumage spread to form a patch of brilliant orange fringed with the silky filaments of the rump feathers and secondaries. The drab-coloured females move down to low perches in the trees above, inspecting the displaying males. A female that is ready to mate eventually descends to a court, landing behind the male. She may rest her head on the "pillow" of his rump feathers, or nibble at the fringes of his rump and wing feathers, until eventually the male hops around and mounts her. At the large lek most intensively studied for several years, in Surinam, 51-61



During the breeding season, males of many species vocalize from prominent perches. This ***Black-and-gold Cotinga*** *is taking a break from long bouts of singing, and indulging in some preening and wing-stretching. Like* Tijuca, *the four bellbirds often sing from high bare branches, though with very different songs. A male Bearded Bellbird* (Procnias averano) *watched from dawn to dusk spent 87% of his time on one favoured perch, 74% of it singing! Of course, the best males will be able to afford more time singing, thus providing a measure by which female cotingas may be able to choose high-quality mates.*

[*Tijuca atra*, Pico dos Marins, São Paulo, Brazil. Photo: Edson Endrigo]



Of the many and varied calls produced by cotingids the best known is that of the ***Screaming Piha****. So loud and diagnostic, and so often used as a backing track to documentaries on natural history, it has virtually assumed the status of a "signature tune" for Amazonia. Living in the dim middle storey, male pihas have forgone bright coloration, and invested everything into their vocal signal. They perch in loose gatherings, or "exploded leks", and sing for much of the day. First, they give a series of cooing notes, rising in pitch. Then they unleash the piercing "pi pi y-o". This finale is produced with what looks like a good deal of effort, and it is astonishingly loud. Standing in the midst of a busy lek is an unforgettable experience, although the birds themselves can be frustratingly difficult to see.*

[*Lipaugus vociferans*, Descobrimento National Park, Bahia, Brazil. Photo: Johannes Ferdinand]

males were present each year, and the courts were densely crowded, some as little as 1-2 m apart. Nearly all matings were performed by a small number of males that occupied central courts. Females clearly made some choice; before mating, they visited the courts of a number of males over a period of several days, usually mating with only one of them. Occasionally, violent and prolonged conflicts took place between males disputing ownership of a court. Other leks of this species at which observations have been made were smaller, with fewer males.

Less is known of the behaviour of the Andean Cock-of-the-rock. The most striking difference between the two congeners is that males of the Andean species display not on the ground, but 4-6 m above it on low perches, which the birds keep almost devoid of leaves by plucking them, using both the bill and the claws. A further difference, at least at the only two leks studied in detail, one in Colombia and a larger one in Venezuela, is that the males are in pairs, the members of each of which regularly perform ritualized bowing displays towards one another. At the smaller of the leks studied, consisting only of three pairs occupying a display area 20-25 m across, one male was dominant and performed all the observed matings. Much larger leks, containing some dozens of males, have been reported elsewhere, however, and it seems unlikely that such a simple dominance hierarchy could be maintained at leks of this size.

The lek organization and displays of the bellbirds are very different. Only the Bearded Bellbird has received detailed, sustained study, by B. K. Snow in Trinidad, but less complete observations of the three other species suggest that they follow the same pattern. Groups of males are much smaller, those studied consisting each of three or four individuals, and the birds are spaced 100 m or more apart. They advertise themselves by uttering amazingly loud hammer-like or bell-like calls (see Voice) from exposed treetop perches, but the females are not courted on these high perches. When a female has been attracted, the male flies steeply down to a special small understorey tree in the forest below. If the female follows him down and is receptive, mating eventually takes place on one particular horizontal side branch of the tree, following an elaborately ritualized series of calls and jumps by the male, culminating in a final explosive "bock" as it leaps on to the female's back. One of the movements involved in the male's preliminary display consists of ritualized preening under the wing, accompanied by prominent display of a patch of bare pinkish skin on the side of the thigh.

At the Bearded Bellbird lek most intensively studied, there were three calling territories, one of which was most favoured. Competition for this territory was intense. When the owner was trapped for ringing, no doubt a traumatic experience for him, he disappeared and his place was at once disputed by the other two males, one fully adult and the other still with a few juvenile



A group of cotingids that owe their common name to the sound of their voice are the bellbirds. Male bellbirds make what are probably the loudest and most far-carrying of all passerine calls. The White Bellbird (Procnias albus) *sounds like the chiming of a bell, but the* ***Bare-throated Bellbird*** *makes more of a tuneless clang, like a hammer hitting an anvil. Information from captive birds suggests that it takes a year for a young bellbird to perfect his call, even when housed with an adult male. In terms of voice, Cotingidae is a family of extremes. Some species rarely fall silent, while others have rarely, if ever, been heard to call.*

[*Procnias nudicollis*, Brazil. Photo: Nick Gordon/ Nature Picture Library]



Most cotingas rely on fruiting trees for much of the year. In general, they favour the fruit of the palm (Arecaceae), laurel (Lauraceae), incense (Burseraceae) and nutmeg (Myristicaceae) families. These trees often bear fruit with nutritious pulp and arils, rich in proteins and fats.
This ***Purple-throated Fruitcrow*** *has been picking individual fruit while perched, but when food items are less accessible they are plucked during short fluttering sallies.*
An aberrant member of the family, this fruitcrow's closest relatives are uncertain. Within Cotingidae, it is remarkable as being a social species, usually found in noisy groups of 3-8 birds, even when nesting. Indeed, it is the only member of the family known to indulge in co-operative breeding.

[*Querula purpurata*, Panama.
Photo: Marie Read]

feathers; the fully adult bird succeeded in taking it. Similarly, during the annual moult, when the territory-owners were absent, their calling perches were temporarily taken by other males, mostly subadults. The general picture was of continual competition by a group of males, of varying ages, for a small number of traditional display territories, one of which was strongly favoured over the others.

Lek displays by males are a feature of several other cotingid species, including the umbrellabirds, the Red-ruffed Fruitcrow, the Capuchinbird and the Screaming Piha. As indicated earlier (see Voice), the umbrellabirds and the Red-ruffed Fruitcrow advertise with booming calls, the Capuchinbird with the extraordinary mooing call from which it gets its alternative name of Calfbird, and the Screaming Piha with a piercingly loud "pi pi yo", which has become almost the "signature tune" of the Amazonian forest, being used as a prominent background sound in many films and television programmes. Of these species, only the Capuchinbird has been studied in detail, by B. K. Snow in Guyana and, for a longer period, by Trail in Surinam. Apart from its bizarre appearance, displays and voice, it is of particular interest as an example of the significant minority of lekking bird species, nearly 25%, which are essentially monomorphic, the sexes being the same in plumage and not very different in size.

The Capuchinbird's lek behaviour exhibits some unusual features. Each season, a single dominant male performs all matings, but the site of the lek, unlike those of other species, changes from year to year; as a result, the dominant male has to establish his dominance afresh each season, without reliance on his previous possession of an established perch. The other males call and display on the surrounding perches, but do not constantly occupy and defend any particular one; in addition, they continually attempt to occupy the dominant male's perch. They also engage in paired displays with other subordinate males, perching side by side and calling alternately, avoiding any overlap in their calls. Such display partnerships, between the same two individuals, last for at least one complete breeding season. Females regularly visit the lek in groups, and while there they are highly aggressive towards one another. Furthermore, subordinate males regularly adopt female-like behaviour, which may allow them to approach, and even land on, the dominant male's perch, and females, conversely, sometimes adopt male display postures, apparently allowing them to supplant other females from the dominant male's perch. In these ways, the lek behaviour of Capuchinbirds differs strikingly from that of the highly dimorphic Guianan Cock-of-the-rock. Most interestingly, in the wake of these studies, Trail has suggested that plumage monomorphism among lekking species has evolved as a result of social competition affecting both sexes, rather than competition between males alone; this bare summary, however, does no justice to the complexity of the case and of the theoretical considerations that are involved.



*In its pointed tip, the beak of the **Sharpbill** differs from those of all other cotingids. This feature seems to owe its form to a suite of unusual foraging techniques. It is used as a tool to unroll curled leaves, and to probe inside leaf clusters, allowing the Sharpbill to reach insect larvae and spiders' nests. It can be poked into tufts of moss and epiphytes, from which other morsels can be extracted. And it comes in handy at dehiscing fruit, when it can be used to pluck ripe seeds from tough husks, as shown here. The Sharpbill is also unusual in that it joins mixed-species flocks, readily foraging in the outermost twigs of branches, and habitually hanging upside-down.*

[*Oxyruncus cristatus cristatus*, Itatiaia National Park, Rio de Janeiro, Brazil. Photo: Edson Endrigo]

Although the breeding habits of the Sharpbill are very poorly understood, it is possible that this species uses an "exploded" lek system. This is suggested by the fact that the males are present for the greater part of the breeding season on their song territories, which tend to be arranged in clusters, with individuals in hearing distance of one another. It is not known, however, whether a female may visit several different males. Within his territory, each male appears to have some three to five singing perches, all within a radius of 100 m, that are used regularly. He gives about four songs from a perch, at the rate of two per minute, before moving to the next perch. Altogether, a male can spend as much as 80% of his time on song perches.

Among a number of cotingas with brilliantly or conspicuously coloured males, at least a part of the repertoire of courtship displays is aerial, taking place above the forest treetops. Not surprisingly, these have been little studied, and nothing is known



*In contrst to parrots (Psittacidae), which are seed-predators that digest the seed itself and defecate only pulp, cotingids are amongst the most important seed-dispersal agents in Neotropical forests. Like the toucans (Ramphastidae) they habitually eat fleshy fruit, as this **Bare-throated Bellbird** illustrates. They digest the pulp, defecate small seeds, and regurgitate large seeds, often far from the source tree. Many cotingas eat the berries of mistletoes (Loranthaceae) and other epiphytes. These have large sticky seeds, so that they attach to branches wherever they are wiped by cotingas. For a parasitic arboreal plant, this proves to be a perfect dispersal mechanism.*

[*Procnias nudicollis*, São Paulo, Brazil. Photo: Edson Endrigo]





One of the strangest displays in the family is performed by one of its most peculiar members, the ***Capuchinbird****. Placed in the monotypic genus* Perissocephalus, *the Capuchinbird seems most closely related to* Pyroderus *and* Cephalopterus. *Males in all these genera produce low mooing or booming noises, but the Capuchinbird sounds especially cow-like, whence the alternative name of Calfbird. Its leks are found by listening for the unlikely sound of lowing cattle high in the trees. At these leks, the dominant male defends a key perch, and subordinate males display nearby. They stand upright with bald heads gleaming, the curved orange undertail-coverts standing out like "tail-lights", and they moo. In trying to ascend the hierarchy, subordinate males will form alliances that last the entire breeding season. Allied males stand shoulder-to-shoulder, calling alternately, as can be seen in the upper photograph. The lek is visited by groups of females, often leading to chaos. Females resort to aggression, or mimicry of males, in an attempt to supplant their rivals. Meanwhile, subordinate males copy the behaviour of females and sneak towards the key perch in search of opportunistic matings. Thus, females compete with females, and males compete with males, a factor which goes some way to explaining their monomorphism, a rare characteristic in lekking species. Capuchinbird leks are situated in the upper canopy of tall rainforest, where only a lucky few have been able to watch them; but in hill forest in the Guianas, leks may be much lower down, only 9-11 m above the ground. The codes of conduct at these leks have only been partially deciphered, and the stratagems employed by both sexes are poorly understood.*

[*Perissocephalus tricolor*, Brazil.
Photos: Nick Gordon/ Nature Picture Library]



During display, the single wattle of the ***White Bellbird*** *is slowly extended, apparently by engorgement of blood vessels. It usually hangs on the right-hand side of the bill, and the double chime of the male ("ding-ding") is accompanied by a swing of the head to the left, which causes the wattle to stream out to the right, clear of the widely opened bill. If it happens to be hanging on the left-hand side, the bird flips it back to the right before making the double chime. All males studied thus far have been "right-wattled", but this bird, of a newly discovered race from the Serra dos Carajás, is "left-wattled"; the photographs are not inverted. Further research is merited.*

[*Procnias albus wallacei*, Serra dos Carajás, Pará, Brazil. Photos: Luiz Claudio Marigo]

about the social organization of the species concerned. The male Plum-throated Cotinga, when displaying, has been described by one ornithologist as leaving a high perch, flying slightly downwards, and then straight out over open space, often water, for about 40 m, there braking suddenly, with a loud whistling "whirr", and returning to its perch. Males of the *Xipholena* species make upward flights of several metres from a treetop perch, perform a half-turn at the top point, and descend steeply to the same perch while holding the wings and tail conspicuously spread; in the case of the White-winged Cotinga (*Xipholena atropurpurea*), the most closely studied of the three species, the descent is accompanied by a loud wing noise. The all-white male Yellow-billed Cotinga undertakes conspicuous display-flights between bare topmost branches of a tall forest tree, or longer flights from one treetop to another. The most spectacular of such flights, however, must surely be that of the Crimson Fruitcrow (*Haematoderus militaris*), which has been seen to fly steeply upwards from a treetop to a height of about 30 m, and then descend slowly with the wings held open, the tail fanned, and the crown, back and breast feathers all puffed out, making the bird appear "rather like a great crimson rugby ball".

Finally, the Purple-throated Fruitcrow has a social organization which is very different from that of any other member of the family, and not unlike that of some of the New World jays. It lives in small groups containing 3-8 individuals, all of which jointly attend a single nest, as well as foraging and roosting together as a unit. All group-members take part in defence of the nest, constantly mobbing intruders and effectively deterring almost all other bird species, including potential nest-predators such as large toucans, from approaching close to it. The fruitcrows are aided in this by the fact that they are not only fairly large, but also relatively long-winged and highly agile in flight. The nest itself, unlike those of most other cotingas, is not particularly inconspicuous, and the obvious presence of the black adults around it further draws attention to it. The whole nesting strategy is thus very different from that of the rest of the family. Nothing is known of the relationships between members of a group.

With the exception of the cocks-of-the-rock, which build large bracket-shaped nests of mud and vegetable material on rock walls, probably using saliva as cement, all cotingids for which relevant information is available build open nests on or among branches of trees or shrubs. These are of very diverse kinds. A few species, breeding at high altitudes in the Andes, construct substantial, well-insulated cup-nests, whereas the known nests of lowland-forest cotingas are nearly all small or very small, but not all of the same type. A nest of the Sharpbill, located at an elevation of 900 m in the south-east Brazilian state of Rio de Janeiro, consisted of petioles covered with mosses, liverworts and spider web, the whole cemented with saliva, and was placed just 1 m beneath the top of the 30-m canopy of the forest. The plantcutters, which live in more open habitats, build a shallow cup-shaped nest from thin dry twigs, lining it with root fibres and other softer material. This rather loose structure, 6-9 cm in height and with a diameter of 10-18 cm, is often placed up to 3 m above the ground inside a thick thorny shrub, but sometimes higher up in the fork of a tree.

Among the most striking, at least to the few ornithologists who have found them, are the relatively tiny nests of some of the fruitcrows, pihas and other medium-sized cotingids. Such nests, placed on a fork of a slender horizontal branch, or between adjacent twigs, consist of a number of interlacing twigs, vegetable fibres or tendrils, forming a small shallow saucer or tiny cup. In several cases, the observer has thought at first that the bird was simply crouching on its perch, no nest being visible. Thus, Skutch, in his account of the first Rufous Piha (*Lipaugus unirufus*) nest that he found, some 6 m up in a small tree in Costa Rica, wrote:

> "Support was provided by two, slender, parallel, horizontal twigs, each about a quarter of an inch [0·6 cm] in diameter. Between these twigs the piha had built a nearly flat pad about three inches [7·5 cm] in diameter and somewhat less than an inch [2·5 cm] in thickness. It was composed almost wholly of wiry tendrils, many of which were coiled.... The whole fabric was light brown in color and so loose and open that I could read a printed page through the middle of it. Green foliage had formed a canopy close above it."

The nests of this kind that have been examined have consisted of materials which, although scanty, are well suited to forming a coherent structure, and are obviously very carefully selected. Nests of the Bearded Bellbird in Trinidad, for example, had a base consisting mostly of a small number of bifurcating twigs with club-shaped ends, very suitable for interlocking, of a tall forest tree, *Terminalia obovata*, with a shallow cup, remarkably tough and durable, consisting entirely of the very fine bifurcating, slightly curved and springy twigs of a smaller tree, *Maprounea guianensis*.



The only bellbird studied in detail is the Bearded Bellbird (Procnias averano)*, but behaviour is probably similar throughout the genus. Males call from high bare branches, either alone or at scattered leks. Females visit a series of males before selecting a mate. Then, at least in the* ***Three-wattled Bellbird,*** *she visits him repeatedly, often perching alongside for prolonged periods, as in the case seen here. Once a male has attracted a female with his songs and triple-pronged facial appendages, he drops to an understorey perch. If she follows, he performs a ritualized display on a horizontal branch, upon which mating eventually takes place.*

[*Procnias tricarunculatus*, Monteverde Forest Reserve, Costa Rica. Photo: Michael & Patricia Fogden]

The only recorded nest of the Pompadour Cotinga was a minute but deep open-work cup, composed of a few woody tendrils, into which the single egg fitted neatly. Similarly, only one Bare-necked Fruitcrow nest has been documented in detail, a very small saucer-shaped structure, not more than 10 cm in diameter, consisting entirely of lichens and fine tendrils of a climbing plant, and placed on a thick horizontal branch, the nest bottom being formed by the branch itself; it could not possibly have held more than a single chick of this rather large cotinga. Finally, to complete the range of very small cotingid nests that have been described in detail, the purpletufts build a tiny cup-shaped nest, very like that of a hummingbird (Trochilidae), fixed by spider web to a thin horizontal branch in a treetop, and again too small to hold more than a single egg. It is very probable that other members of the family construct nests that are equally tiny in relation to the size of the bird, but these have as yet not been adequately described.

These very small nests seem to be adapted primarily to be as inconspicuous as possible, a most important requirement in tropical forest, where rates of nest predation are very high. A light, open-work structure may also be important in preventing the nests from becoming sodden in heavy rainfall. The extreme reduction of clutch size, to a single egg, is therefore, it seems, a consequence of nest size, and not of the inability of the parent bird to feed more than one young. In the absence of evidence, this theory must remain speculative, but it should be noted that the only medium-sized or large cotingas that lay two-egg clutches are the two cocks-of-the-rock, their massive nests being comparatively safely located and often conspicuous. A puzzling possible exception, however, is the Purple-throated Fruitcrow, which lives in small social groups all members of which join together in defending a comparatively large and conspicuous nest. Several adults may feed the young, sometimes "queuing up" at the nest to do so. Evidence on this species' clutch size is conflicting, but the only certain record is of a single egg.

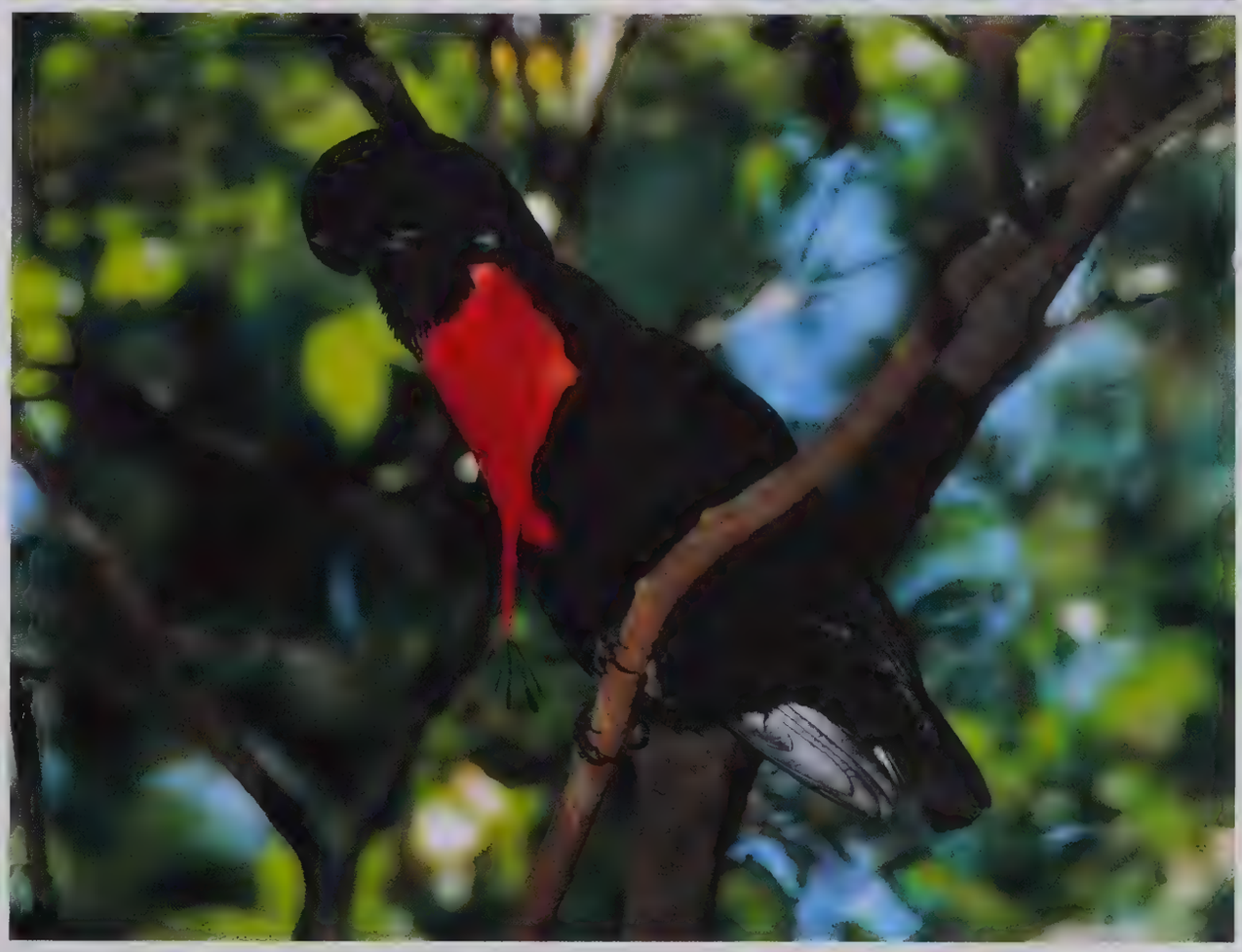
Cotinga eggs are typically buff, khaki or olive in ground colour, with spots or blotches of darker browns, sepia, ashy violet and similar colours, these often concentrated more thickly around the broad end. Almost certainly, the colour scheme is cryptic. The cocks-of-the-rock, the rock nests of which are often in semi-darkness, have eggs similar to those of other cotingids but with a paler ground colour. The eggs are unusually large for passerine birds; no obvious reason for this can be suggested, but it may be that the large egg size is related to the long incubation period, enabling the young bird to complete as much as possible of its growth in the egg. As already intimated, the clutch of almost all medium-sized and large cotingas consists of a single egg. The exception is the cocks-of-the-rock, which lay two eggs, as do the Andean fruiteaters. The Swallow-tailed Cotinga and, so far as they are known, the high-Andean *Ampelion* cotingas and related genera lay two or three eggs, whereas the clutch size of the plantcutters is 2-4 eggs. An old report claiming that the Rufous-tailed Plantcutter lays as many as five or six eggs appears unsubstantiated, and is deemed hardly likely to be true.

For all cotingid species for which the nesting habits are known, with the possible exception of the Swallow-tailed Cotinga, only the female incubates. Knowledge of the incubation and fledging periods is very incomplete. Compared with those of oscine passerines, the incubation periods of most cotingids are very long: 26-28 days for the Capuchinbird and the cocks-of-the-rock, 25-26 days for the Rufous Piha, 25 days for the Purple-throated Fruitcrow, 23 days for the Bearded Bellbird, and 17-20 days for two of the Andean fruiteaters breeding in captivity. The few fledging periods accurately documented are also comparatively protracted. Young of the two cocks-of-the-rock remain in the nest for up to 48 days, the corresponding period for the Purple-throated and Red-ruffed Fruitcrows and the Bearded Bellbird being 30-33 days, and for the Rufous Piha 28 or 29 days. At the single nest of the Sharpbill studied, the two chicks fledged after 25-30 days. The plantcutters have a more "normal" strategy, with incubation lasting for about two weeks and the chicks fledging after 17 days or so.

In the case of the fruiteaters and the high-Andean cotingas, the Swallow-tailed Cotinga and the group-nesting Purple-throated Fruitcrow, both male and female feed the nestlings. Similarly, the male Rufous-tailed Plantcutter also assists his partner in the rearing of the chicks. For all other cotingids for which the breeding habits are known, the female alone feeds and cares for the young.

Cotingid nestlings, like the adults, are unusually diverse in appearance. Except for the cocks-of-the-rock, in which the nest-





*Between March and June, this male **Bare-necked Umbrellabird** attends a lek in the highlands of Costa Rica. The top photograph shows him installed on a branch in the middle storey, resting between bouts of calling. From this perch, every minute or so, he gives a deep double-barrelled boom. In preparation for this vocal activity, he inflates the air-sacs housed in his throat, and his bare red-skinned wattle expands. Then he leans forward and extends the frontal crest even further forward so that it entirely covers the bill. When standing in this position, he expels air from his lungs, as shown in the lower photograph. This produces a deep booming noise, which is given extra resonance by the air-filled sacs. In addition, the booms of males are often accompanied by dry hacking sounds. Females visit these leks singly to copulate with the dominant male.*

[*Cephalopterus glabricollis*, Costa Rica. Photos: Michael & Patricia Fogden]



*Some male birds have no parental input other than sperm. When a female invests so much in nesting, incubation, provisioning and post-fledging care, it pays her to choose the father of her offspring very carefully. In some species, such as the **Andean Cock-of-the-rock**, this has led to the evolution of leks. Leks are permanent display arenas at traditional sites, where groups of males compete amongst each other for central positions. Young males start at the edge of the lek, and gradually move inward as they climb the hierarchy. By mating with the central male, the female saves a lot of time assessing prospective partners, and ensures that the genes passed on to her offspring are of the highest quality.*

[*Rupicola peruvianus saturatus*, Peru. Photo: Jean Paul Chatagnon/Bios]

ling's down feathers are long but sparse, they are thickly covered with down. Although it is not possible to give a comprehensive account, it seems that some, at least, of their diversity involves camouflage, thus varying according to the circumstances of the nest-site. The nestling of the Elegant Mourner is one of the most remarkable, being apparently camouflaged to resemble moss covered with fruiting bodies; its long filamentous down feathers are black or brown basally and conspicuously white-tipped. The nestling Bare-necked Fruitcrow bears an extraordinary resemblance to lichen, an appropriate camouflage as the nest is a small pad on a thick tree branch. B. K. Snow described the newly hatched nestling of a Bearded Bellbird as "thickly covered with grey-white hair-like down about 10 mm in length"; during the first twelve days, the chick, when disturbed or handled at the nest, "would roll up into a ball so that from above neither eyes, beak nor legs were visible, making it look more like a small mammal or hairy caterpillar than a nestling". Two striking cases of camouflage exhibited by the chicks of two globally threatened south-east Brazilian cotingas have been described by E. O. Willis and Y. Oniki. The nearly full-grown nestling of a Buff-throated Purpletuft, on its tiny exposed nest high in a bare treetop, grizzled grey above and barred with dusky on its pale chest, resembled both in colour and in the irregularity of its dorsal plumage "a scaly mass of bark or a bulky mass of debris on the flattened nest". In the second example, a small nestling Cinnamon-vented Piha, covered with orange down, lay "flat and fuzzy on the nest, seeming a hairy caterpillar or leaf, most of the day. The down was pale orange, and rather conspicuous in any sun-fleck, probably a mimic of hairy and urticating caterpillars." The thick down of these nestlings may also be associated with the fact that they are brooded by the parent very little after the first few days, so that efficient heat conservation may be especially important for them.

Everything that happens at the nests of these cotingas is silent, and movement is reduced to a minimum. When the female Bearded Bellbird comes to feed her nestling, she flies in swiftly and silently, lands on a perch near the nest, and remains motionless for a minute or so, evidently checking that no danger threatens, before hopping on to the nest. The parent Cinnamon-vented Piha makes an even more cautious approach to its nest, often stopping and perching motionless for minutes on end before going to it. The young chicks of both species beg for food merely by raising the head and gaping. It is very evident that the nest, the nestling, and the behaviour of parent and young are all highly adapted so as to avoid detection by nest-predators. In this connection, the behaviour of the parents at the recently discovered nest of the Black-faced Cotinga is somewhat puzzling. Both parents tended and fed the young in a tiny nest high in a treetop, and often vocalized loudly while doing so. It would be interesting to know whether Black-faced Cotingas can effectively defend their nests against potential predators, as do Purple-throated Fruitcrows.

A curious and unexplained habit is exhibited by some of the cotingas that build very small nests. This involves the dismantling and scattering of the materials of their empty nests shortly after the end of their use, such behaviour having been recorded for the Blue Cotinga (*Cotinga nattereri*), the Lovely Cotinga and the Rufous Piha. The material is not used for a new nest, and it seems most unlikely that such tiny nests would form a "search image" for potential predators and thereby endanger future nests built in the vicinity. The reason for this unusual behaviour remains a mystery.

So few cotinga nests have been studied that, with one exception, no reliable data exist on the breeding success of the members of the family; equally, nothing can be stated with regard to post-fledging parental care or the survival of young birds. The exception is the Guianan Cock-of-the-rock. In one year, only two of a total of 22 nests of this species produced fledged young, and only ten out of 31 did so in the next year, giving success rates of, respectively, 9·1% and 32·3%. The low success in the first year was thought to be perhaps atypical, being the result of unusual weather conditions. Otherwise, of five Bearded Bellbird nests in which eggs were laid, only one was successful; three of the losses were probably due to predation and one, in the most exposed site, to destruction of the nest by wind.

The age of sexual maturity is not known for any of the Cotingidae. In the case of males, it is not necessarily the same as the age of acquiring fully adult plumage or, in the lek-mating species, the age at which successful copulation is achieved. As already mentioned, it is usual that only one or a few dominant individuals succeed in mating. Males of the Guianan Cock-of-





*Plumage maturation in the male **Andean Cock-of-the-rock** is delayed. He retains brown or patchy plumage for three years, after which he is fully adult. Thenceforth, he holds a territory at the lek, and spends much of the day resting or displaying 2-6 m above the ground. He uses one perch, or a set of perches, keeping these bare by plucking leaves with the bill and claws. Displaying males are often loosely distributed in pairs, and greet one another in ritualized fashion. This involves much jumping, bowing, head-bobbing, wing-flapping, bill-snapping and the production of a strange nasal moaning call. The logic of the lek is founded on a winner-take-all philosophy: males in the middle get lots of matings, males at the edge get none. Not surprisingly, central positions are fiercely contested, and disputes over court ownership are often violent and prolonged.*

[*Rupicola peruvianus sanguinolentus*, west Andes of Ecuador. Photos: Günter Ziesler]





*The female **Andean Cock-of-the-rock** is a dowdy bird. She has dark legs, chocolate-coloured plumage, and a much reduced crest. Despite her sombre garb, the gathered contestants become animated when she approaches the lek. Confronted by an audience of gaudy and enthusiastic males, she always looks tremendously uninspired. The males redouble their efforts. They posture frantically, and produce a lot of noise. She tends to pass from court to court, focusing entirely on central positions, sizing up the occupants. Sometimes she passes through the lek for several days before choosing a particular male. When she perches beside him, he responds by bowing low and motionless, and by calling. Eventually, she signals her choice by nibbling at his feathers. Taking this as his cue, he hops onto her back, grabbing her wings for balance, and they copulate. Thus ends the male's involvement in family life: the female disappears into the forest to lay her eggs and raise her chicks alone.*

[*Rupicola peruvianus saturatus*.
Manu National Park and Biosphere Reserve, Peru.
Photos: Manfred Pfefferle]



*A few cotingids, including fruiteaters, purpletufts and plantcutters, are pair-living birds. Thus, unlike many of its lekking relatives, the male **Rufous-tailed Plantcutter** shares parental duties with his mate. He is seen here collecting nesting material, and he will later contribute to the feeding of nestlings. Most small cotingids build miniature nests out of pieces of lichen, or wiry bits of rootlet. They are never seen carrying anything bigger than fragments of vegetation. Plantcutters, as this male demonstrates, are fond of considerably bulkier material.*

[*Phytotoma rara*, Puerto Saavedra, Arauco, Chile. Photo: Andy & Gill Swash]

the-rock acquire fully adult plumage at the age of three years, and at that age begin to hold courts at the lek and so have the opportunity to mate.

Movements

Many cotinga species are, so far as is known, sedentary. There is undoubtedly some dispersal of young birds, but no detailed information is available. Only one of the typical cotingids, the Swallow-tailed Cotinga of east Brazil, is known to carry out seasonal north-south movements, being present in the extreme south of its range, in Rio Grande do Sul, only in the austral spring and summer, between late September and late March. Farther north, in the main part of its range, it breeds in the mountains and descends to lower levels in winter.

The Rufous-tailed and White-tipped Plantcutters, which breed farther south than any other members of the family, are generally resident, but the southernmost populations, as well as those breeding at higher elevations, are at least partially migratory. These wander outside the breeding season, and some probably move northwards. Indeed, it seems likely that most Rufous-tailed Plantcutters in the southern parts of Chile and Argentina migrate after breeding. Records of White-tipped Plantcutters in Brazil and Uruguay probably involve migrants.

Seasonal altitudinal movements are made by a number of other cotingas, including the Three-wattled Bellbird and the Bare-necked Umbrellabird in Central America, and the Bare-throated Bellbird in Paraguay and east Brazil. The Three-wattled Bellbird's movements are the most striking so far known. After breeding at elevations above 1200 m, it initially moves up to higher levels, before descending to sea-level, and has been recorded on islands off the south coast of Panama. A recent study, involving a programme of radio-tagging, has demonstrated that individuals from the highlands of north Costa Rica move first to lowlands in south-east Nicaragua, and then to Pacific coastal areas of south-west Costa Rica. Bare-necked Umbrellabirds breed locally in subtropical forest at 800-2000 m in Costa Rica and west Panama. A recent study of this species in the Monteverde Forest Reserve, in Costa Rica, revealed that the birds left the breeding areas in late July and August and moved down to the lowlands, returning to the breeding grounds in March; interestingly, the majority of males spent the non-breeding season at elevations of 100-500 m, whereas most females were found below 200 m at that time of the year. There is some evidence that the Bare-throated Bellbird may even be migratory, at least in part, in south-east Brazil and adjacent Paraguay, and records of the species from Argentina suggest that it may be only a transient visitor there.

From the little evidence available, the Buff-throated Purpletuft in south-east Brazil appears to be highly unusual in that it breeds in the coastal lowlands in the austral late winter and moves up into the highlands in the off-season. Breeding records of this species cover the period from July to October, and at other times of the year individuals have been observed at higher elevations.

Less regular movements are reported for a number of cotingids, and the nature of these is as yet unclear. It seems probable that some of the species inhabiting lowland forest of Amazonia and the Guianas may wander widely, presumably following the ripening of the fruits on which they depend (see Food and Feeding), and this may also be the reason for the apparently wide, unpredictable wandering of the white cotingas in Central America. Neither this factor nor juvenile dispersal, however, seems an adequate explanation for the occasional very long movements made by single White Bellbirds, including adult males, which have been recorded several hundred kilometres away from their normal range, north to Trinidad and south in Brazil to the middle and lower Rio Negro. The definite Trinidad



*The nests of plantcutters are simple, dish-like structures. They are usually placed low in dense, thorny cover, this concealment and inaccessibility offering some defence against predation. The nest of the **White-tipped Plantcutter** is surprisingly large for the size of the bird (4·5-10 cm high, 10-17 cm across), and is lined with softer material, such as root fibres.*

[*Phytotoma rutila rutlia*, Tucumán, Argentina. Photo: José & Adriana Calo]



*The only nest of the **Bare-necked Umbrellabird** ever to be reported was a large structure of twigs, leaves and moss, situated about five metres above the ground. It was far larger and bulkier than the nests of any other cotingid yet recorded. It contained a single egg which was incubated for at least 24 days. Umbrellabirds have the biggest nests amongst cotingids, while many other species in the family build miniature structures. Indeed, relative to their own size, some cotingas make the smallest nests of any passerine birds.*

[*Cephalopterus glabricollis*, Costa Rica. Photo: Michael & Patricia Fogden]

records, of which there are at least six, are all of males, but this is not surprising, as the inconspicuous females would be difficult both to detect and to distinguish from the resident Bearded Bellbird females. It may be that such birds are potential pioneers, and that a tendency to move long distances away from the established range is an important facet of the behaviour of bellbirds, and of other species with limited montane breeding areas, as a means of establishing new breeding populations. The recently discovered population of White Bellbirds in the Serra dos Carajás, in central Brazil, may be an example of such a successful pioneering movement in the fairly recent past. More speculatively, the Three-wattled Bellbird of Central America, the White Bellbird's closest relative, probably originated from long-distance dispersal of White Bellbird stock from the Guianan highlands in the more remote past. The small population of Swallow-tailed Cotingas in the foothills of the Bolivian Andes, some 1200 km from the species' main range, in south-east Brazil, may have a similar origin.

Relationship with Man

Before the era of scientific collecting, humans apparently took little notice of most of the cotingas. Only the brilliant male plumage of some of the species drew attention. H. Sick, for example, has recorded that the Emperor of Brazil had a mantle made of cock-of-the-rock feathers, and that various indigenous tribes used brilliant cotinga feathers in their costumes, those of the Plum-throated Cotinga being especially prized. Similarly, male Banded Cotingas were once collected by local Indians and Bahian nuns, who used the birds' feathers in order to make artificial flowers. Today, there is still limited collecting of spectacular male cotingas, which are roughly prepared, as flattened skins, for the tourist trade. This probably has relatively little impact on cotingid populations, but it could become a cause for concern in the case of species with low population levels or declining numbers, of which the Banded Cotinga is one example (see Status and Conservation).

Sick also noted that various species are considered by local people to be "gamebirds". Somewhat unexpectedly, in addition to the large Red-ruffed Fruitcrow, considerably smaller birds such as the Swallow-tailed Cotinga, the Black-and-gold Cotinga and the blue cotingas are all taken for food. Hunting would probably not be a great threat to the populations of these species, so long as they retain adequate extents of suitable habitat, but hunting for food is now considered to be one of the threats to the survival of the Long-wattled Umbrellabird (*Cephalopterus penduliger*), a Vulnerable cotingid already greatly reduced in numbers by the destruction of trans-Andean forests (see Status and Conservation).

In Brazil, the Bare-throated Bellbird is widely kept as a cagebird, and trapping must have some impact on the adult male population of this Near-threatened species (see Status and Conservation). Its social system, however, involving competition among males for mating perches (see Breeding), should enable it to withstand the removal of some males from the population. It seems rather surprising that this is the only cotingid that is widely kept as a pet. Visitors to Brazil must often wonder at the popularity of a bird that utters a succession of ear-splitting, unmusical hammer-like notes from a small cage hung near a house door.

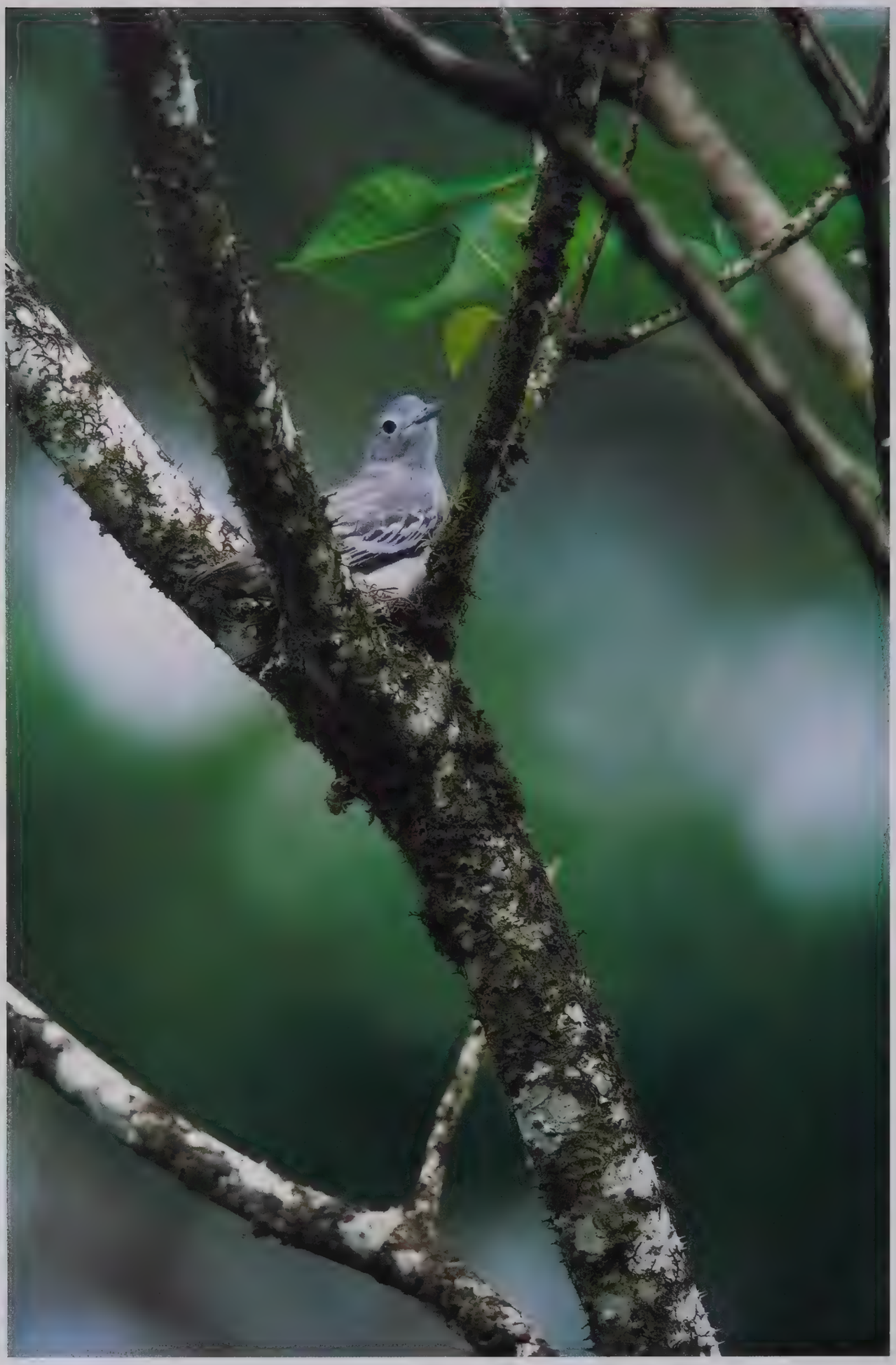
Because of their wonderful plumage colours, many cotingids are popular as cagebirds in other parts of the world, such as Europe. As they are essentially frugivorous (see Food and Feeding), they are relatively easy to keep in captivity.

Instances of conflict between cotingids and human interests are rare. Indeed, in the case of most members of the family they are non-existent. Only the plantcutters have any adverse impact. Because they are primarily herbivorous, feeding on leaves, buds and shoots, plantcutters can present problems not only to private gardeners, but also to commercial crop-growers. In some parts of its range, therefore, the Rufous-tailed Plantcutter is often considered an agricultural pest. It appears to have a clear preference



The nominate race of the ***Swallow-tailed Cotinga*** *is a bird of cloudforest edges and patchily forested hillsides in south-east Brazil, although it has been found in tiny numbers in Argentina and Paraguay. Like many other canopy-dwelling cotingids, it builds a small, inconspicuous nest in a bare fork. It uses lichen for most of the structure, a material which adds greatly to the nest's camouflage on lichen-encrusted branches. Interestingly, it is the only member of the family for which male incubation has been reported (this photograph shows a female). It differs from most of its relatives in favouring scattered trees at forest margins, in clearings or even in gardens. Because of this preference for isolated trees, nests have proved relatively easy to find around hotels in Itatiaia National Park, and near the research station buildings in Intervales State Park. The Swallow-tailed Cotinga is highly distinctive in both morphology and behaviour. Its pale bill and strongly barred underparts are unusual, but its long forked tail is unique in the family, and may be an adaptation to its foraging technique of sallying after flying insects above the treetops. Given its relatively small population, and its dependence on shrinking montane forests, it is classed as Near-threatened. Recently, after an absence of almost 100 years, the population in north Bolivia was rediscovered. This isolated race,* boliviana, *differs from the nominate in a range of relatively minor morphological features, but it is suggested that it may deserve treatment as a separate species.*

[*Phibalura flavirostris flavirostris*, Intervales, São Paulo, Brazil. Photo: Edson Endrigo]



The smallest nests in the family are built by members of high-canopy genera, such as Cotinga, Xipholena, Conioptilon, Iodopleura *and* Carpodectes. *These groups build small shallow saucers, or tiny cup nests, in the forks of branches. The nests are usually loosely woven with a few wiry tendrils or narrow twigs, as can be seen in this photograph. As well as being incredibly inconspicuous by virtue of their tiny size, such small, loosely bound nests must be less susceptible to waterlogging in heavy rainfall. This female* ***Snowy Cotinga*** *hardly looks like she is incubating at all, and in precisely this manner she succeeds in drawing less attention to her egg or nestling. The nest is so small in this species, and many other canopy-nesting cotingids, that the clutch is limited to a single egg. The genus* Carpodectes *is allied to* Cotinga *and* Xipholena, *and like them its members range through the forest canopy eating fruit. The females of all three species are greyish and almost dove-like, but the males are brilliantly, almost luminously, white. The latter are visible from considerable range, as they perch atop dead snags over the canopy.*

[*Carpodectes nitidus*, La Selva Biological Reserve, Costa Rica. Photo: Marco Saborío]



*The **Guianan Cock-of-the-rock** differs from all other members of the family, apart from its sole congener, in having its nest fixed to a rock face rather than a tree. The nest itself is usually a bracket-shaped structure built from mud and vegetable matter, and most often placed in a dark crevice. In this case, the nest is not a bracket, but a platform built on top of a convenient ledge. Saliva is probably used to cement the nest material together, and to attach the structure to the rock. The female incubates the one or two eggs for about 28 days, which is a very long incubation period for a bird of this size.*

[*Rupicola rupicola*, Iwokrama Forest Reserve, Guyana. Photo: Pete Oxford/DRK]

for the young leaves of cereal crops, in addition to which it sometimes causes damage locally in gardens and fruit orchards.

Status and Conservation

Of the 71 species included in Cotingidae (see Systematics), as many as 16 are currently classified as globally threatened. In addition, the nominate race of the Elegant Mourner, often treated as a full species, distinct from the three Andean subspecies, is listed as globally threatened. Of this total of 17 threatened taxa, eight are from the Atlantic Forest of eastern South America, the destruction of which in the lowlands has long been a source of major concern to conservationists, and four are from Central American forests, which have suffered equally severe, if less extensive, destruction. Of the remaining five, two live in high-Andean temperate woodland, a habitat in danger of being destroyed by marginal farming activity, and another, the Scimitar-winged Piha, inhabits humid subtropical forest in the Bolivian Andes, where its fragmented habitat is subjected to continued clearance and degradation. Finally, the spectacular Long-wattled Umbrellabird is confined to the severely reduced trans-Andean forests of Colombia and Ecuador, and the Peruvian Plantcutter inhabits surviving areas of low woodland, riparian thickets and desert scrub in coastal north-west Peru.

One of these globally threatened species, the Kinglet Calyptura, is classed as Critical. Five others are Endangered, while ten species are listed as Vulnerable. The nominate subspecies of the Elegant Mourner is also placed in this last category.

All of the threatened cotingids have suffered from serious habitat loss and degradation, which continues to be a major problem for them; a few are under additional pressure from hunting and/or collecting for the cagebird trade. A further five species, having suffered similar habitat loss, are currently classified as Near-threatened. These are the Swallow-tailed Cotinga, the Black-and-gold Cotinga, the Hooded Berryeater (*Carpornis cucullata*), the Fiery-throated Fruiteater (*Pipreola chlorolepidota*) and the Bare-throated Bellbird. Four of these are from south-east Brazil, one of them, the Bare-throated Bellbird, also extending west into Paraguay. The fifth, the Fiery-throated Fruiteater, inhabits humid forest in the Andean foothills, ranging from south Colombia south to central Peru.

Thus, 21 members of the family, or 30%, either are already at risk or could soon become so, and one additional subspecies is threatened. Moreover, the rather distinctive Bolivian subspecies of the Swallow-tailed Cotinga, rediscovered in 2000, almost a century after its original discovery, is apparently confined to a restricted area of open forest and humid forest fragments around the town of Apolo, in central La Paz; part of the area, which may be as small as 50,000 ha, is within the Madidi National Park, providing some protection for the taxon. If *boliviana* is recognized as a distinct species, it should be considered globally threatened.

None of the cotingas of the lowland Amazonian and Guianan forests is at present considered threatened. This is due to their generally having extensive ranges, and to the fact that, despite the recent devastation in many areas, much forest remains.

Deforestation seems almost certainly to have been responsible for the disappearance of the Kinglet Calyptura. It had not been recorded for over a century, and was presumed by many ornithologists to be extinct. In October 1996, however, it was rediscovered by a remarkably keen-eyed observer, R. Parrini, at 550 m on the edge of the Serra dos Órgãos National Park, some 60 km north of the city of Rio de Janeiro. Two individuals were observed on several occasions during 27th-30th October, but, in spite of intense and repeated searching, no further sightings of this tiny, inconspicuous species have been made. The fact that there are about 50 specimens of this cotingid in museum collections, the last one dated around 1890, suggests that it was not uncommon 150 years ago. Since that time, virtually all forest below 1000 m in the area has been destroyed. It is to be hoped that intensive surveys will lead to the calyptura being refound. In any event, conservation of the remaining lowland forest in the vicinity of the 1996 sightings must surely be considered a priority measure.

Elsewhere in eastern Brazil, the Grey-winged Cotinga is also restricted to the Rio de Janeiro vicinity, where it is present in small numbers in Serra dos Órgãos National Park and the Tinguá Biological Reserve. In both areas disturbance and fires are potential threats, and the species is listed as Vulnerable. Two others placed in this threat category are the Black-headed Berryeater (*Carpornis melanocephala*) and the Cinnamon-vented Piha. The former, found primarily in 13 protected areas in Alagoas and from Bahia south to São Paulo and Paraná, is fairly common locally, but has declined significantly. The piha occurs from Bahia, Mi-





Very different from the tiny, exposed nest of the ***Bearded Bellbird*** *in Trinidad, this female of the slightly different race from north-east Brazil has built a comparatively bulky stick platform in dense cover. Unlike the spectacular male bellbirds, females are well camouflaged against a background of branches and foliage. This is an important adaptation as the total nesting cycle is very long for birds of this size. Incubation in the Bearded Bellbird lasts 23 days, and the nestling fledges some 30-33 days later. The chick is covered in dense, 10-mm-long grey-white down. It rolls up when disturbed so that bill, eyes and legs are invisible. It has been suggested that this plumage and behaviour has evolved to mimic urticating caterpillars, which most predators avoid. In addition, the chicks are rarely brooded after hatching, and thus the thick down probably functions as vital insulation. The provisioning process in this species, as with most in the family, is swift and silent, stealth being the key to minimizing predation. After landing near the nest, the female waits for a moment to check that all is clear, and then hops onto the nest, feeds her offspring, and flies off. The chick too is apparently silent throughout this sequence of events, so as not to attract attention.*

[*Procnias averano averano*, Maranhão, Brazil. Photos: Anita Studer]



Swallow-tailed Cotinga *nestlings are covered in dappled down. This aids against potential predation, as they look just like a small mat of lichen when they crouch still. Mimicry of lichen is prevalent in those canopy species that choose nest-sites in the fork of high branches. Most cotingas of this type lay one egg due to constraints of space, but the Swallow-tailed Cotinga nests in trees so rich in epiphytic bryophytes and lichens that it can afford to build a larger structure holding 2-3 eggs. As in high-Andean cotingids, and the Purple-throated Fruitcrow* (Querula purpurata)*, there is biparental care. Here a stunningly beautiful male feeds his offspring.*

[*Phibalura flavirostris flavirostris*, Intervales, São Paulo, Brazil. Photo: Edson Endrigo]

nas Gerais and Espírito Santo south to Santa Catarina, but has become rare, with recent records from perhaps a dozen or so sites; its population, now highly fragmented, seems to be strongest in the Augusto Ruschi Biological Reserve, in Espirito Santo, where a few thousands of individuals occur. Likewise, increasing deforestation and habitat fragmentation have led to a decline in the numbers of the nominate race of the Elegant Mourner, which is now rare; it occurs in more than ten reserves, but effective protection of these areas is rarely guaranteed.

Three cotingids in this region come under the high-risk category of Endangered. The Buff-throated Purpletuft is confined to very few sites in north-east Brazil and just a few more from Bahia south to São Paulo, and is clearly threatened in both parts of its range by loss of Atlantic Forest; the fact that it occurs in mainly lowland coastal forest renders it much more at risk than was previously thought, as this habitat is being rapidly cleared. Similarly, the White-winged Cotinga, with an estimated total population of the order of 12,000-13,000 individuals confined



Although this female ***Andean Cock-of-the-rock*** *is regurgitating a meal of berries, she often feeds her nestlings with insects and even small vertebrates, such as reptiles and amphibians. These are beaten against branches and offered head-first to the young. At some nests the chicks are fed almost entirely on insects and other animal prey, a diet which presumably provides the proteins necessary for growth. Despite this, the fledging period in cocks-of-the-rock is very long, lasting up to 48 days. Fledging success seems quite low, probably in the region of 10-30%, perhaps because nests are susceptible to discovery.*

[*Rupicola peruvianus*, Peru. Photo: Kevin Schafer]



Being so strictly tied to forests, most members of Cotingidae are affected by deforestation, the rampant environmental scourge of South and Central America. The diminutive ***Fiery-throated Fruiteater,*** *for example, lives in the Andean foothills from south Colombia to central Peru, a region where natural habitat is relentlessly being replaced by agricultural land, pasture, roads and settlements. There is still enough suitable forest to suggest that its population is too large to fit the criteria delimiting threatened-species categories. On the basis of habitat loss it is placed in a holding bay for species that might soon meet those criteria: the Near-threatened category. In part, its inclusion in this category is based on the fact that we know so very little about it. It is the smallest member of its genus, a bird of unobtrusive vocalizations and retiring habits in the dense lower and middle growth of forests. These features do not lend it to easy observation. Its numbers are possibly much higher than records suggest, but until this can be confirmed through detailed surveys and mist-netting at a range of sites it certainly merits close attention.*

[*Pipreola chlorolepidota*, San Diego Zoo, USA. Photo: Josep del Hoyo/ Lynx Edicions]



*Like all its congeners, the male **Turquoise Cotinga** is a stunning sight when seen at close range. This species is restricted to Costa Rica and Panama, where it lives in humid forest and secondary woodland from the lowlands up to 1850 m. Unfortunately, it is thought to be in steep decline due to the steady destruction and fragmentation of these habitats. This has led to its recent inclusion in the list of Threatened birds, with the category of Vulnerable. Despite a relatively healthy prognosis for conservation in Costa Rica, large swathes of humid forest have been removed in recent years, and many species are at risk until this loss of habitat can be stalled, and reversed.*

[*Cotinga ridgwayi*, Las Cruces, Costa Rica. Photo: Kevin Zimmer]

more or less to 13 protected areas along the coast from Paraíba south to Rio de Janeiro, has lost 60% or more of its Atlantic Forest habitat since 1980. As is so often the case, inadequate law enforcement in protected areas is a big problem facing many bird species, including this cotingid, and fires, as well as illegal logging and other activities, are a constant potential threat. Bearing this in mind, the situation of the Banded Cotinga is even more worrying. This species has a very small range, covering about 780 km² in south-east Bahia and north Espírito Santo, and a global population of fewer than 1000 individuals, almost all now confined to four nominally protected reserves. It was often collected for the cagebird market, but is now seen with far less frequency in this trade, no doubt because it has become very much rarer.

On the opposite side of South America, the population of the Peruvian Plantcutter has now been reduced to a similarly low level, so that it, too, is Endangered. In the past, small populations of this interesting species were known to occur at a minumum of 14 localities, covering most of coastal north-west Peru south to Lima, but its range has become very small and severely fragmented. Since the late 1990s, there are records from only eight locations, and the plantcutter is absent from much apparently suitable habitat. About 80% of its world population is found in the department of Piura, where an estimated 50,000 ha of habitat in the Talara region, from Quebrada Salada to Quebrada Ancha and south to Cerro Negro, holds between 500 and 1000 individuals. The Peruvian conservation organization *ProAvesPerú* is collaborating with the national petrol company *PetroPerú*, which owns most of the remaining habitat, and the National Audubon Society with the aim of declaring a 10,000-ha area as a reserve; in addition, it has initiated a public-awareness programme, with the cartoon character "Coco the Plantcutter" as the star figure. The remaining sites where the species survives are small forest fragments around Chiclayo, in Lambayeque department, each of which covers only a few hundred hectares and holds 20-40 individuals; more recent observations have been made near Trujillo, in La Libertad, and as far north as Mancora, in north-west Piura. It is of major concern that all forests in which the Peruvian Plantcutter has been found are threatened by burning, goat grazing, felling for timber, extraction for firewood and charcoal, and conversion to sugar-cane fields and other forms of cultivation, the same factors that presumably destroyed the historical sites. In Lambayeque, a considerable proportion of habitat close to Rafan is degraded, and parts of this area were converted to sugar production in the 1990s; Murales forest is an Archeological Reserved Zone and strict wardening has maintained the habitat, but land rights to part of the forest were sold for agricultural conversion in 1999, and government intervention was necessary to prevent further sales of land for agriculture. Given these numerous and immediate threats, which typify the problems facing conservationists in the modern world, the Peruvian Plantcutter should probably be returned to the threat category in which it was classified until the year 2000, that of Critical.

The Pacific slope of the Andes is also home to the Long-wattled Umbrellabird. This most striking of cotingids lives in humid forest in south-west Colombia and west Ecuador, where it has been recorded at elevations ranging from 140 m up to 1800 m. Since 1960, extensive areas of forest have been destroyed in this region, especially in the lowlands, and the species has become, for the most part, rare and local. Intensive agricultural development is considered a major threat. Road-building has opened up more and more previously remote areas, leading to further habitat destruction and facilitating the hunting of the umbrellabird, which is often killed for food. In addition, this species may suffer through being collected for the bird trade. As a result of these factors, its population is probably declining at a fast rate, and it is considered Vulnerable.

Higher up in the Andes, three restricted-range cotingids have suffered from clearance and degradation of their forest habitats to the point that they, too, are now placed in the category of Vulnerable. These are, from north to south, the Chestnut-bellied Cotinga (*Doliornis remseni*), occurring from Colombia south to extreme north Peru, the White-cheeked Cotinga, confined to the Peruvian Cordillera Occidental, and the Scimitar-winged Piha, which is found in the upper yungas of extreme south-east Peru and Bolivia. The first of these three was not discovered until 1989; it lives in dense thickets around the timber-line, at about 3100-3700 m, where it has been recorded from a handful of localities. The White-cheeked Cotinga is patchily distributed but locally common, although its global population, estimated at 1500-6000 individuals in 1992, is small; it inhabits mainly *Polylepis-Gynoxys* woodland at 2700-4250 m, where it apparently feeds on two species of mistletoe and is probably the main dispersal agent for them (see Food and Feeding). The third species, the Scimitar-winged Piha, has a very small total range, within which it has been found at only very





*The **Black-headed Berryeater** and the **Cinnamon-vented Piha** are restricted to the Atlantic Forest of Brazil. Neither species is on the verge of extinction, but they have both suffered huge losses due to deforestation in their restricted ranges, especially in the lowlands. Given this situation, they are treated as Vulnerable. The berryeater occurs from Alagoas to Paraná, and the piha occurs in a slightly smaller range, from Minas Gerais to Santa Catarina. Both have become scarce overall; they are susceptible to local extinction because they occur in forests at low or moderate elevations, and these are much more prone to clearance than are montane forests. The berryeater has its stronghold in two crucially important reserves: Sooretama and Linhares. These blocks of forest stand in a low-lying region otherwise almost wholly cleared of natural habitat. The piha is absent from these lowland sites, occurring at slightly higher altitude in the foothills and lower montane zone. Its stronghold probably lies in another protected area, the Augusto Ruschi Biological Reserve (Nova Lombardia), where a few thousand individuals are thought to survive. Effective protection of these three sites, all of which lie in the state of Espirito Santo, would help to ensure a safe future for these rare cotingids.*

[Above: *Carpornis melanocephala*, Juréia, São Paulo, Brazil.

Below: *Lipaugus lanioides*, Intervales, São Paulo, Brazil.

Photos: Edson Endrigo]



*The **Buff-throated Purpletuft** is classified as Endangered. It occurs at very few sites in north-east Brazil, and a few more further south, from Bahia to São Paulo. It breeds at low altitude and spends the summer at higher elevations, a reversal of the migratory pattern found in most of the region's birds. Because of these altitudinal movements, it needs more habitat than a sedentary species in order to survive. In particular, its predilection for lowland breeding habitat places it in danger of extinction, given the severe degradation and fragmentation of lowland forest in coastal Brazil.*

[*Iodopleura pipra ieucopygia*, Boa Nova, Bahia, Brazil. Photo: Edson Endrigo]

few localities, all in montane forest at 1800-2750 m; if it requires old-growth forest during at least part of the year, as has been suggested, this would render it more susceptible than other yungas species to the effects of selective and small-scale logging.

Of the four globally threatened cotingids of Central America, the one considered to be at greatest risk is the Yellow-billed Cotinga. This rather specialized member of the family survives in a few places on the Pacific coast of Costa Rica and extreme west Panama. It inhabits mangroves, a habitat that has been extensively destroyed on a global scale, and it also occurs in adjacent areas of lowland forest and scrub, most of which have likewise been eliminated. This cotinga, reduced to the brink of extinction in Panama and with a small and declining population remaining in Costa Rica, is now listed as Endangered. The Turquoise Cotinga is restricted to the same two countries, but lives in humid forest and secondary woodland at up to 1850 m; as a result of severe fragmentation of these habitats, this species is thought to be in rapid decline. Similarly, while the subtropical forest inhabited by the Bare-necked Umbrellabird in those countries remains sufficiently intact, much of the lowland forest in which this species spends the non-breeding season (see Movements) has been lost; in north Costa Rica, for example, 35% of the remaining lowland forest was removed in the period from 1986 to 1992, and the little habitat still left is under severe threat. This same factor has added to the pressures facing the Three-wattled Bellbird, which also moves down into the Central American lowlands after breeding. These last three cotingids are all classified as Vulnerable.

Particular mention must be made of one further cotingid, the Chestnut-capped Piha. The conservation status of this species has not been formally assessed, since it was not discovered until 1999 and was officially described two years later, in 2001. At that time, the piha appeared to be fairly common within a narrow belt of very humid premontane forest in the central range of the Colombian Andes, where it had been recorded at five localities. Continuing studies in 2002 led to the species being detected at a further 20 sites in the area, all within the elevational range of 1400-1900 m. Intensive observations by A. Cuervo revealed that, in small forest fragments, this newly discovered cotingid exhibited a high degree of morphological asymmetry, apparently related to lower survival rate, reduced fitness and poorer aerodynamics. This would indicate that it is one of the species most adversely affected by forest fragmention. In view of the current rate of forest clearance within the piha's exceptionally small known range, it is suggested that the species be given the conservation status of Endangered or, perhaps more fittingly, Critical. An important 320-ha forest block at the type locality, La Forzosa, which harbours populations of several other threatened bird species, has now been afforded formal protection, despite great adverse pressures. More complete investigation of the Chestnut-capped Piha's present range is desirable, and the establishment of additional protected areas in this ornithologically poorly known region is an urgent priority.

Finally, the role of protected areas in the conservation of threatened species needs to be considered. With the possible exception of the Kinglet Calyptura, all of the globally threatened cotingas have subpopulations, at least, occurring in reserves and other protected areas. While this should provide some reason for optimism, there is certainly no room for complacency. Protective legislation is all too frequently ignored, and illegal activities, including logging, burning and even large-scale clearance of vegetation, remain a widespread problem. As forest destruction continues at an increasingly alarming rate, the future survival of many threatened cotingas, as well as that of numerous other species, will depend on the effective maintenance of already existing forest reserves, together with the establishment of new ones of adequate size.

General Bibliography

Bock (1994), Brush (1969), Cracraft (1981), Haffer (1974), Hellmayr (1929), Hilty (1994), Irestedt *et al.* (2001), Johansson *et al.* (2002), Lanyon, S.M. (1985), Lanyon, S.M. & Lanyon (1989), McKitrick (1985), Olson (1970), Prum (1990a, 1990b, 2000, 2001), Prum *et al.* (2000), Schlatter (1985), Sclater (1888), Sibley (1996), Sibley & Ahlquist (1990), Sibley & Monroe (1990, 1993), Sibley *et al.* (1988), Skutch (1999), Smith (1985), Snow, D.W. (1973a, 1973b, 1976a, 1976b, 1978, 1982, 1985b), Trail (1990), Traylor (1979a), Völker (1952), Whittaker (1996a), Willis (1986).



PLATE 1

inches 4
cm 10

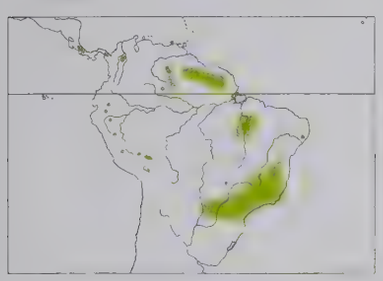
Genus *OXYRUNCUS* Temminck, 1820

1. Sharpbill

Oxyruncus cristatus

French: Oxyrhynque huppé **German**: Flammenkopfkotinga **Spanish**: Picoagudo

Taxonomy. *Oxyrhyncus* [sic] *cristatus* Swainson, 1821, Brazil.
Often placed in a separate, monotypic family Oxyruncidae or, sometimes, in Tyrannidae, but DNA-DNA hybridization data indicate that it is related to other cotingids. Race *phelpsi* and *tocantinsi* possibly indistinguishable from *hypoglaucus*. Species' distribution extremely disjunct, perhaps relictual; individuals observed in NW Colombia, SE Ecuador, Peru, NW Bolivia and S & NE Brazil of uncertain racial identity, thought possibly to represent one or more undescribed races. Six subspecies recognized.
Subspecies and Distribution.
O. c. frater (P. L. Sclater & Salvin, 1868) - Costa Rica and W Panama (E to Veraguas).
O. c. brooksi Bangs & Barbour, 1922 - E Panama.
O. c. phelpsi Chapman 1939 - mountains of S & SE Venezuela (except Mt Roraima) and adjacent parts of Brazil and Guyana.
O. c. hypoglaucus (Salvin & Godman, 1883) - SE Venezuela (Mt Roraima), the Guianas and NE Brazil (Amapá).
O. c. tocantinsi Chapman 1939 - S Pará (from E side of lower R Tocantins SW to Serra dos Carajás, on W side), in Brazil.
O. c. cristatus Swainson, 1821 - SE Brazil (S Goiás, Minas Gerais and Espírito Santo S to Santa Catarina), E Paraguay and extreme NE Argentina (N Misiones).
Also occurs (subspecies undetermined) in NW Colombia (Serranía de San Lucas), SE Ecuador (Cordillera Cutucú, Cordillera del Condor), Peru (Junín, San Martín/Amazonas, Cordillera Azul, Cuzco, Puno), NW Bolivia (La Paz, R Tuichi) and S & NE Brazil (S Mato Grosso, Mato Grosso do Sul, Alagoas, S Bahia).



Descriptive notes. c. 17 cm; 42 g. Distinctive cotingid with sharply pointed bill and small head. Male nominate race has black crown mixed with olive, red erectile crest usually held flattened (thus concealed); upperparts olive-green, two indistinct pale yellow wingbars; outer primary with serrated leading edge; face and throat whitish with narrow black scaling; underparts yellow with heavy black spots, belly whiter; iris red; bill and legs greyish. Female differs from male in having crest reduced to narrow central line, iris orange, outer primary not serrated. Juvenile lacks red on crown. Races differ mainly in intensity of yellow wash below, also in slight variations in hue elsewhere: *frater* is paler yellow below than nominate; *brooksi* is yellowish-white below, the yellow paler and less extensive, reduced on breast and absent on foreneck, also lower back and rump slightly paler green than previous; *hypoglaucus* has throat and breast greyish-white, rest of underparts pale greenish-yellow, centre of belly cream-coloured; *phelpsi* resembles previous, mostly whitish below, little yellow cast; *tocantinsi* is very like last. VOICE. Male song exceptionally distinctive, an extremely firm, sharp whistle lasting 1-3 seconds, starts at frequency of c. 3 kHz and descends over wide interval (from a fourth to as much as a full octave), likened to sound of a falling bomb. Other described calls include weak "tet" and high tremulous "tsirrr", context in which given not known; also, weak descending chatter of 6-10 syllables heard during possible courtship.
Habitat. Humid tropical forest, usually at 400-1100 m, in Venezuela to 1200 m (Sierra de Lema); reported from lowlands, almost down to sea-level, in non-breeding season in Brazil (Pará).
Food and Feeding. Feeds on fruits, also invertebrates. Both large and small fruits eaten, include berries of various families (e.g. Ericaceae, Loranthaceae, Moraceae), also arillate fruits; in SE Brazil, fruits of 9 plant species (of 8 families) recorded as eaten. Invertebrates include caterpillars. When catching arthropods, may hop along high branches, probing into tufts of moss or epiphytes; also moves with great agility among leaves of outermost twigs of canopy, often hanging upside-down and making rapid pecks into bases of leaf clusters. Sharp, wide-based bill sometimes used as a wedge to pry open rolled leaves in order to extract concealed prey, similarly to open dehiscing fruit to extract seeds. Usually seen singly. Often associates with mixed-species flocks, particularly canopy flocks formed around tanagers (Thraupidae), and seems generally to join those that remain in same spot for lengthy period; reported also as following roving flocks, such behaviour presumably more likely outside breeding season.
Breeding. Singing period Feb-Jun in Costa Rica and Sept-Nov in SE Brazil, probably represents breeding season; nest found in Feb in Venezuela. Loose groups of 3-4 singing males, defending separate but adjoining territories each of c. 200 m in diameter, may represent "exploded" lek; singing male stretches neck forward and fluffs out neck feathers, but does not expose red crest. Nest a small open cup of petioles, covered with mosses, liverworts and spider web, the whole cemented with saliva, placed high in canopy. Clutch uncertain, probably 2 eggs; at one nest (SE Brazil), attended by only one adult, presumed female, incubation in shifts of c. 30 minutes, absences of c. 8 minutes, lasted 14-24 days, the two chicks fed by regurgitation, approximately one feed per hour early in nestling period, rising to two per hour in later stages, fledged after 25-30 days.
Movements. Minimal information. Probably sedentary; possibly some altitudinal movements, descending to lower levels outside breeding season.
Status and Conservation. Not globally threatened. Status difficult to determine, as species poorly known and very hard to observe. Appears to be fairly common, but often local; only few records from Argentina, all in Iguazú National Park. Distribution oddly fragmented, but no reason to suppose that this is other than natural. Racial affiliation of individuals recorded in humid upper tropical forest in E Peru (four sites), in Bolivia (SW of Apolo, in La Paz) and at isolated localities in Brazil (S Mato Grosso, Alagoas) requires investigation: in addition, discovered in 2001 in Colombia (Serranía de San Lucas, N end of C Andes); was also reported from S Ecuador (S Zamora-Chinchipe) in Jul 1993, but details lost. Because this species inhabits montane forest, it is less at risk of habitat loss than are those species occupying lowland forest and, although poorly known, it is not of immediate conservation concern; indeed, there is some evidence of range expansion in the mountains of SE Brazil.
Bibliography. Blake (1950), Brooke *et al.* (1983), Brooks *et al.* (1993), Chapman (1931, 1939), Chebez (1994), Chebez *et al.* (1999), Davis (1986), Dubs (1992), Eisenmann (1955), Finch, D.W. (1991), Fogden (1993), Forrester (1993), Gilliard (1941), Guix (1995), Guix *et al.* (1992), Haverschmidt & Mees (1994), Hayes (1995), Hellmayr (1929), Hilty (2003), Lowen *et al.* (1996), Mayr & Phelps (1967), Meyer de Schauensee (1982), Novaes (1978a), Parker *et al.* (1991), Payne (1984), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), do Rosário (1996), Saibene *et al.* (1996), Schubart *et al.* (1965), Schulenberg & Servat (2001), Schulenberg *et al.* (2001), Scott & Brooke (1985), Sibley *et al.* (1984), Sick (1971, 1993, 1997), da Silva (1993), Slud (1964), Snyder (1966), Stiles (1985), Stiles & Skutch (1989), Stiles & Whitney (1983), Stotz *et al.* (1996), Tobias *et al.* (1993), Tostain *et al.* (1992), Traylor (1979a), Wetmore (1972).

Genus *PHYTOTOMA* Molina, 1782

2. Peruvian Plantcutter

Phytotoma raimondii

French: Rara du Pérou **German**: Graubrust-Pflanzenmäher **Spanish**: Cortarramas Peruano

Taxonomy. *Phytotoma raimondii* Taczanowski, 1883, Tumbes, Peru.
Genus formerly treated as constituting a separate family of uncertain affinities or, sometimes, as a subfamily within Tyrannidae; more recent genetic data, however, indicate close relationship, possibly as sister-group, to a cotingid clade formed by the genera *Ampelion*, *Doliornis* and *Zaratornis*. Forms superspecies with *P. rutila*. Monotypic.
Distribution. Coastal NW Peru (Tumbes very locally S to La Libertad).



Descriptive notes. 18·5 cm; 36-44 g. Distinctive, with short but expressive crest, pale eyes, short, conical bill with finely serrated edges. Male has cinnamon-rufous spot above bill; rest of head and upperparts dull ash-grey, some striping on crown and back; wings blackish, whitish lesser and median wing-coverts, conspicuous whitish tips of greater coverts (wingbar), whitish fringes of tertials; tail dusky, feather tips white; chin to breast and flanks pale ashy grey, rest of underparts cinnamon-rufous, undertail dark grey with white tips; iris yellowish; bill dark grey; legs dark grey. Female is greyish-buff overall, buff-brown back broadly striped blackish, whitish underparts heavily striped blackish-brown, blackish-brown wings with two narrow white wingbars. Juvenile undescribed. VOICE. Call "errrrrrr", repeated several times, with notes shortening and falling in pitch, similar to call of *P. rutila* but more squeaky, less mechanical-sounding.
Habitat. Sparse desert scrub and mostly barren coastal dunes, with large bushes openly dispersed, from sea-level to 550 m. Preferred habitat sparse dry mist forest contains algarrobo (*Prosopis pallida*), *Acacia macrocantha* and *Cucurbita*, with dense and diverse layer of flowering shrubs including *Capparis scabrida*, *C. angulata*, *C. ovalifolia*, *Cercidium praecox*, *Cordia lutea*, *Galvezia limensis*, *G. fructicosa*, *Maytenus octogona* and *Psittacanthus chanduyensis* (some of which are very scarce and localized). Also occurs in riparian thickets and low dense or open woodlands, usually dominated by *Prosopis* trees, with some *Acacia*.
Food and Feeding. Herbivore; feeds on buds, shoots and leaves of *Prosopis* and other trees and shrubs, also some fruit. Forages in pairs or small groups.
Breeding. Specimens of two males with active gonads and of laying female in Mar, male with slightly enlarged testes in Apr, and three specimens with inactive gonads in Apr, Aug and Sept; in Aug, male atop a bush and holding twig in its bill seen to fly over to a female. Clutch probably 2-4 eggs; incubation and fledging periods not recorded.
Movements. Resident.
Status and Conservation. ENDANGERED. Restricted-range species: present in Tumbesian Region EBA. Range very small and severely fragmented, with records from only eight locations since late 1990s, and much apparently suitable habitat unoccupied. Formerly, small populations known from 14 localities covering most of coastal NW Peru, from Tumbes S to Lima. Currently, c. 80% of global population found in Talara region of Piura (from Quebrada Salada to Quebrada Ancha and S to Cerro Negro), where estimated 50,000 ha of habitat holding 500-1000 individuals; elsewhere, survives in small forest fragments around Chiclayo area of Lambayeque, including Reque, Rafan, Murales forest, Batan Grande, Chaparri Private Protection Area and Siete Techos, each of which only a few hundred hectares in size and each holding c. 20-40 individuals. More recent records extend as far N as Máncora (N Piura) and as far S as Virú, S of Trujillo (La Libertad). Most of remaining habitat in Talara area owned, and hitherto protected, by the national petrol company (PetroPerú), which is currently collaborating with Peruvian conservationists and the National Audubon Society with aim of establishing a 10,000-ha reserve; programme designed to raise public awareness in the region also initiated. In rest of species' range, all forests threatened by burning, grazing, cutting for timber, firewood and charcoal, and conversion to cultivation (especially sugar cane), the factors that presumably destroyed the historical sites; considerable proportion of habitat close to Rafan is degraded, and parts of this area were converted to sugar production in 1990s. Murales forest is protected as an Archeological Reserved Zone and strict wardening has maintained habitat, but land rights to part of Murales were sold for agricultural conversion in 1999, and government intervention was necessary to prevent further sales of land for agriculture. Until re-

On following pages: 3. White-tipped Plantcutter (*Phytotoma rutila*); 4. Rufous-tailed Plantcutter (*Phytotoma rara*); 5. Red-crested Cotinga (*Ampelion rubrocristatus*); 6. Chestnut-crested Cotinga (*Ampelion rufaxilla*); 7. Bay-vented Cotinga (*Doliornis sclateri*); 8. Chestnut-bellied Cotinga (*Doliornis remseni*); 9. White-cheeked Cotinga (*Zaratornis stresemanni*); 10. Elegant Mourner (*Laniisoma elegans*).

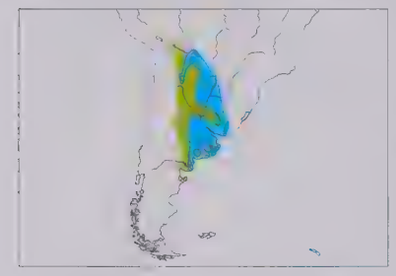
cently, this species was classed as Critical; in view of the numerous and immediate threats facing it, it should probably be returned to that category.
Bibliography. Anon. (2001a), Best & Kessler (1995), Bond (1956a), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cracraft (1985), Flanagan & Malo (2000), Flanagan & More (2003), Hellmayr (1929), Koepcke (1961, 1970), Meyer de Schauensee (1982), Parker *et al.* (1996), Plenge (1979), Ridgely & Tudor (1994), Schlatter (1985), Schönwetter & Meise (1969), Stattersfield & Capper (2000), Stotz *et al.* (1996), Taczanowski (1883), Traylor (1979a).

3. White-tipped Plantcutter

Phytotoma rutila

French: Rara du Paraguay **Spanish**: Cortarramas Argentino
German: Zweibinden-Pflanzenmäher
Other common names: Red-breasted/Reddish Plantcutter; Bolivian Plantcutter (*angustirostris*)

Taxonomy. *Phytotoma rutila* Vieillot, 1818, Paraguay.
Genus formerly treated as constituting a separate family of uncertain affinities or, sometimes, as a subfamily within Tyrannidae; more recent genetic data, however, indicate close relationship, possibly as sister-group, to a cotingid clade formed by the genera *Ampelion*, *Doliornis* and *Zaratornis*. Forms superspecies with *P. raimondii*. Two subspecies recognized.
Subspecies and Distribution.
P. r. angustirostris d'Orbigny & Lafresnaye, 1837 - highlands of C & S Bolivia (La Paz and Santa Cruz S to Tarija), and N Argentina (around Pichanal, in N Salta).
P. r. rutila Vieillot, 1818 - W Paraguay (E to near R Paraguay), N & E Argentina (S to Mendoza, La Pampa, Río Negro and CE Chubut) and W Uruguay.



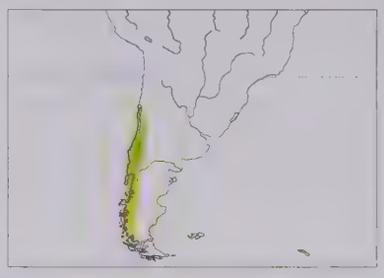
Descriptive notes. 18-19·5 cm; 30-57 g. Distinctive, with short crest, conspicuous pale iris, short, stout, conical bill with finely serrated edges. Male has rufous forehead, dark grey crown and upperparts with sparse slaty streaks, dusky blackish wings and tail, two broad white wingbars (lower one sometimes lost through wear), conspicuous white tips of tail feathers (except central pair); chin and throat to ventral region rufous, except for grey-brown sides and flanks; whitish underwing-coverts, dark grey undertail with white tips; iris pale yellowish to hazel; bill dark grey to blackish; legs dark grey. Female has head and upperparts blackish-brown, white streaks on head, buffish-grey streaks on back, wings blackish-brown with 1-2 (depending on state of wear) narrow white wingbars, pale edges of tertials, outer web of outer tail feather edged white, underparts buffy to ochraceous with conspicuous blackish-brown streaks. Juvenile is grey-brown above, feathers faintly tipped brownish, upper wingbar broader, tail like female's, underparts uniformly buff-brown; immature male is obscurely streaked blackish-brown above, buffy grey-brown below, belly whitish, flanks rufous-buff, sometimes faint blackish-brown streaks on breast and upper belly; immature female resembles adult, but has vent more ochraceous. Race *angustirostris* differs from nominate in having stronger bill and broader white tail tip. VOICE. Usual call, by both sexes, a mechanical "errrrrrr", like sound made by winding old-fashioned alarm clock, sometimes repeated several times, and sometimes followed by lower and shorter "errrr"; also scratchy sounds during foraging.
Habitat. Chaco woodland, open woodland and woodland edge with dense undergrowth, also riparian thickets, *pampas*, arid lowland and montane scrub, semi-open groves with acacia (*Acacia*) and other thorny bushes (e.g. *Prosopis* and *Berberis* in Andes); also gardens, orchards, agricultural land in semi-arid regions. Sea-level to 1800 m in most of range; 600-3600 m in Andes.
Food and Feeding. Herbivore; feeds mainly on foliage (up to 90% of diet); some fruits and flowers also taken. Food items include buds, shoots and leaves of various species (e.g. *Lycium*, *Prosopis*, *Celtis tala*, *Schinus longifolius*, *Acacia*), and *Prosopis* seeds. Forages in pairs, family parties, small groups, or even flocks of up to 100 individuals; usually 3-4 m up in tree and shrub foliage, but sometimes on ground.
Breeding. Eggs in Jan-Feb and Sept-Dec; fledglings recorded in Dec and Jan, and juveniles in Dec, Feb, Mar and May; may raise two broods per year. Simple basket-shaped nest, diameter 10-17 cm, height 4·5-10 cm, made from small branches and lined with soft material, e.g. root fibres and sometimes grasses, often placed close to ground in thorny bush, also 1-4 m above ground in small tree or shrub. Clutch 2-4 eggs; incubation by female, period 14-15 days; chicks cared for by both parents, nestling period 17 days.
Movements. Resident and partial migrant. Some S populations move N after breeding, and those breeding at high elevations descend to lower levels in austral autumn; all records from Uruguay possibly involve migrants. One record from Brazil (Rio Grande do Sul).
Status and Conservation. Not globally threatened. Fairly common, even locally abundant seasonally. Not restricted to undisturbed habitats, as it occurs in agricultural lands and gardens. Nominate race occurs in several dozen protected areas in Argentina, Bolivia and Paraguay. N race *angustirostris* has declined as a result of widespread fragmentation and degradation of the natural bushy vegetation (e.g. *Prosopis* and *Berberis*) in Bolivian highlands, and is known to be present in only one protected area (Palmacito).
Bibliography. Barrows (1883), Bosque & Bucher (2002), Bucher *et al.* (2003), Canevari *et al.* (1991), Chebez *et al.* (1999), Contreras & Davies (1980), Couve & Vidal-Ojeda (2003), Cuello (1985), Fjeldså & Krabbe (1990), Flores & Capriles (1998), Forrester (1993), Fraga & Narosky (1985), Friedmann (1927), Friedmann *et al.* (1977), Guerrero & Arambiza (2001), Hayes (1995), Hellmayr (1929), Hoy (1976), Johnson (1967), Klimaitis & Moschione (1987), López, B. (1997), Maijer (2000), Mazar Barnett & Pearman (2001), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Navas (1994), Navas & Bó (1993b, 2000), Nellar (1993), Nores (1986), Nores *et al.* (1983), Olrog (1958), Parker (1993b), Parker *et al.* (1996), de la Peña (1987, 1989, 1995, 1997), de la Peña & Rumboll (1998), Quiroga *et al.* (1998), Ridgely & Tudor (1994), Schmitt *et al.* (1997), Schönwetter & Meise (1968, 1969, 1988), Short (1975), Sibley & Monroe (1990), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1979a), Wetmore (1926), Zapata & Martínez (1972).

4. Rufous-tailed Plantcutter

Phytotoma rara

French: Rara à queue rousse **Spanish**: Cortarramas Chileno
German: Rotschwanz-Pflanzenmäher
Other common names: Chilean Plantcutter

Taxonomy. *Phytotoma rara* Molina, 1782, Chile.
Genus formerly treated as constituting a separate family of uncertain affinities or, sometimes, as a subfamily within Tyrannidae; more recent genetic data, however, indicate close relationship, possibly as sister-group, to a cotingid clade formed by the genera *Ampelion*, *Doliornis* and *Zaratornis*. Monotypic.
Distribution. C & S Chile (S fromVallenar, in S Atacama) and SW Argentina (S from Neuquen) S to Tierra del Fuego.



Descriptive notes. 18-20 cm; 38-44 g. Distinctive, with short crest, bright eye, short, stout, conical bill with finely serrated edges. Male has chestnut crown, blackish head side; hindneck and upperparts grey-brown, broadly streaked blackish-brown, wings blackish, broad white band on median wing-coverts and narrower one on greater coverts, tertials edged with buff; uppertail black, rufous inner webs; orange-rufous below, palest on belly, blackish underwing-coverts; dusky undertail with minute rufous-grey tips and broad rufous subterminal band on outer rectrices; iris reddish, rarely orange; bill blackish; legs dark grey. Female has head side and upperparts light grey-brown, broadly streaked blackish-brown, two narrow buffy wingbars and buff edges of tertials, buffy underparts with dark brown streaks, belly plainer. Juvenile is uniformly grey-brown with narrow buffy wingbars; immature male differs from adult in having black-brown streaks on crown, underparts streaked blackish-brown and buffy admixed with rufous. VOICE. Mechanical-sounding rasp, "e-e-e-e-e-e-e-e-e-e-errrrrrrr", initial notes accelerating and rising in volume and slightly in pitch, final "errrrrrrr" like sound made by the winding of an old-fashioned alarm clock. Contact call a mechanical "rara-rara".
Habitat. Open thorny scrub (e.g. with *Berberis* bushes), woodland edges, clearings in *Nothofagus* forest, and secondary forest; also farmland, hedgerows, orchards, vineyards, gardens. Sea-level to 2700 m.
Food and Feeding. Diet mainly grasses, buds, shoots and leaves, especially of legumes, also some fruits and berries; insects also taken. Clear preference for vegetative matter, especially young leaves of monocotyledons, e.g. wheat (*Triticum*) and oat (*Avena*). Berries taken include those of e.g. *Rubus ulmifolius*, *Aristotelia chilensis*, *Cestrum parqui* and *Myoporum tenuifolium*. Nestlings fed almost exclusively with insects. Forages in pairs in breeding season, in groups of 6-12 individuals at other times. Feeds both on ground and in foliage.
Breeding. Two seasons, in Oct-Nov and in Dec-Jan; eggs in Jan and Oct-Dec, nestlings in Nov. Shallow cup-shaped nest, diameter 14-18 cm, height 7-9 cm, loosely built from thin dry twigs and padded with root fibres, often placed 1-3 m above ground inside thick thorny shrub, also sometimes high in tree, usually in fork of horizontal branch. Clutch 2-4 eggs, old reports of 5-6 eggs considered unreliable; incubation lasts c. 2 weeks; nestling period not documented.
Movements. Resident in most of range. Those in far S migrate N after breeding; also, individuals breeding at higher altitudes wander to lower levels in austral winter. Accidental in Falkland Is.
Status and Conservation. Not globally threatened. Fairly common and widespread. Not restricted to undisturbed habitats, as it occurs in secondary forest, agricultural areas and even gardens. Occurs in many protected areas, e.g. La Campana Peñuelas Biosphere Reserve and Puyehué National Park, in Chile, and Nahuel Huapi and Los Glaciares National Parks, in Argentina. Considered an agricultural pest in some parts of range, owing to its habit of eating young leaves of commercial cereal crops; sometimes causes local damage in gardens and fruit orchards.
Bibliography. Albert (1898), Araya & Chester (1993), Araya & Millie (1986), Blondel *et al.* (1984), Canevari *et al.* (1991), Chebez *et al.* (1999), Eydoux & Gervais (1838), Fjeldså & Krabbe (1990), Fraga & Narosky (1985), Fraser (1843), Goodall *et al.* (1956), Hellmayr (1929, 1932), Jaksic & Feinsinger (1991), Jaramillo (2003), Johnson (1967), Küchler (1936), Landbeck (1877), López-Calleja & Bozinovic (1999, 2000), Mazar Barnett & Pearman (2001), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Navas (1965), Parker *et al.* (1996), Pässler (1922), de la Peña (1989), de la Peña & Rumboll (1998), Pereyra (1937, 1938), Rezende *et al.* (2001), Ridgely & Tudor (1994), Schlatter (1985), Schönwetter & Meise (1969), Sibley & Monroe (1990), Stotz *et al.* (1996), Traylor (1979a), Vuilleumier (1985), Woods (1988).

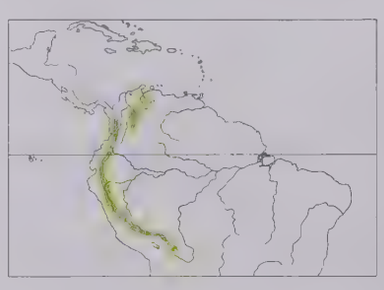
Genus *AMPELION* Tschudi, 1845

5. Red-crested Cotinga

Ampelion rubrocristatus

French: Cotinga à huppe rouge **German**: Rotschopfkotinga **Spanish**: Cotinga Crestirrojo

Taxonomy. *A[mpelis] rubro-cristata* d'Orbigny and Lafresnaye, 1837, Ayopayo, Cochabamba, Bolivia.
Genus appears to form a clade with *Doliornis* and *Zaratornis*; anatomical research and recent genetic data indicate close relationship to *Phytotoma*. Monotypic.
Distribution. N Colombia (Santa Marta Mts), also Sierra de Perijá (Colombia-W Venezuela border); and Andes from W Venezuela (S from NE Trujillo) and Colombia S to Bolivia (S to Santa Cruz).



Descriptive notes. 21-21·5 cm; male 51-80 g, female 47-67 g. Plain cotinga with long crest, which usually laid flat along nape, but may be conspicuously displayed, raised and spread transversely. Plumage is grey, darker on head and, especially, on wings and tail; nuchal crest chestnut-maroon; white streaking on tail-coverts both above and below, extending to variable degree across rump and vent; white subterminal bar on tail (visible from below or in flight); iris deep red; base of bill ivory-white or very pale grey, tip blackish-grey; legs black or dark grey. Sexes alike in plumage. Immature paler than adult, with extensive pale

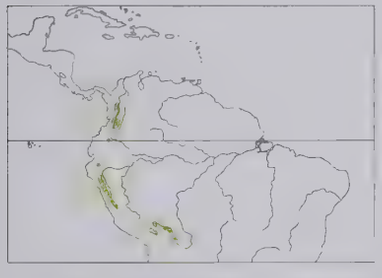
feather fringes, diffuse rufous coloration mostly on head and neck; passes through succession of stages before gaining adult plumage. Voice. Commonest call a guttural, frog-like note, "rrrreh"; also, when disturbed, series of soft, nasal "eh-eh-eh...".
Habitat. Edges of cloudforest, patches of trees and bushes, locally hedgerows with trees bordering agricultural land. Mainly 2500-3900 m, exceptionally down to 2200 m.
Food and Feeding. Mainly fruits; occasionally insects. In E Andes of Colombia, fruits of 8 species (from 8 families) recorded, with *Schefflera bogotensis* (Araliaceae) and *Hieronyma huilensis* (Euphorbiaceae) numerically the most important. Fruits usually plucked during aerial sally, sometimes from perched position; flying insects taken in short sallies from exposed perches. Sometimes in small groups of up to six individuals.
Breeding. Laying recorded in Jan in Peru and Nov in Bolivia; records of moult, presumably post-breeding, suggest no clearly defined breeding season in any part of range. Raises and spreads crest, lifts tail and bows during courtship. Nest a large cup of mosses, lichens and twigs, sited 1·3-3 m above ground in bush or on low tree branch. Clutch size not recorded, but one nest contained single nestling, and brood of two recently fledged young observed; incubation and fledging periods not documented.
Movements. Presumably resident.
Status and Conservation. Not globally threatened. Common to fairly common. Very wide range and tolerance of variety of disturbed habitats should ensure its survival. Occurs in several protected areas throughout range, including Sierra Nevada National Park (Venezuela), Munchique National Park (Colombia) and Podocarpus National Park (Ecuador).
Bibliography. Arango (1990), Baez *et al.* (1997), Best & Clarke (1991), Best *et al.* (1997), Bloch *et al.* (1991), Butler (1979), Chapman (1921), Fjeldså & Krabbe (1990), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Koenen & Koenen (2000), Koepcke (1961, 1970), Meyer de Schauensee (1982), Ortiz & Carrión (1991), Parker *et al.* (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Vuilleumier (1969), Walker (2001), Williams & Tobias (1994).

6. **Chestnut-crested Cotinga**

Ampelion rufaxilla

French: Cotinga à tête rousse **German**: Braunohrkotinga **Spanish**: Cotinga Cresticastaño

Taxonomy. *A[mpelis] rufaxilla* Tschudi, 1844, Vitoc Valley, Junín, Peru.
Genus appears to form a clade with *Doliornis* and *Zaratornis*; anatomical research and recent genetic data indicate close relationship to *Phytotoma*. Two subspecies recognized.
Subspecies and Distribution.
A. r. antioquiae (Chapman, 1924) - Andes of Colombia (W range in Valle and Cauca, and C range S to Huila) and probably extreme N Ecuador (W Sucumbíos).
A. r. rufaxilla (Tschudi, 1844) - Andes of extreme S Ecuador (S Zamora-Chinchipe), Peru, and Bolivia (La Paz, Cochabamba).



Descriptive notes. c. 21 cm; male 71-77 g, female 69-74 g. Long nuchal crest usually at least partly visible, sometimes conspicuously displayed. Nominate race has grey on face, becoming blackish on lores and forecrown; much of rear crown, including elongated feathers, bright chestnut; lower head to throat largely cinnamon; upperparts olive-grey with dusky streaks; wings and tail blackish, bright chestnut on shoulder; chest olive-grey, rest of underparts pale yellow, boldly streaked blackish; iris bright red; bill black, blue-grey base; legs dark grey or dark olive. Sexes alike in plumage. Immature unrecorded. Race *antioquiae* is somewhat larger than nominate, with wider and more numerous streaks below, chestnut areas darker. Voice. Long, guttural "ch-ch-ch-rrrrrreh", longer than that of *A. rubrocristatus*; also short "reh" notes.
Habitat. Montane forest; 1750-2740 m.
Food and Feeding. Fruits and insects, the latter regularly taken in flight sallies.
Breeding. Little known. Laying recorded in Dec in SE Peru, and female with enlarged ovary collected in Apr in S Colombia. Only one nest recorded, in SE Peru, an open, unlined cup made almost wholly of lichens, slender twigs woven into base, c. 12 m up in crown of evergreen tree. No further information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Uncommon to rare, and often rather local, throughout most of range. Very rare and local, and extremely few records, in Ecuador, where first recorded in 1984 in N and in 1987 in S; apparent absence from almost entire country difficult to explain. Occurs at lower elevations than *A. rubrocristatus*, and lacks that species' wide habitat tolerance.
Bibliography. Best *et al.* (1997), Chapman (1917c), Fjeldså & Krabbe (1990), Hellmayr (1929), Hilty (1985), Hilty & Brown (1986), Meyer de Schauensee (1982), Parker *et al.* (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg & Servat (2001), Schulenberg *et al.* (2001), Stotz *et al.* (1996), Walker (2001).

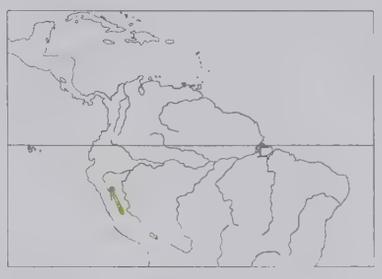
Genus *DOLIORNIS* Taczanowski, 1874

7. **Bay-vented Cotinga**

Doliornis sclateri

French: Cotinga de Sclater **German**: Braunbauchkotinga **Spanish**: Cotinga de Sclater

Taxonomy. *Doliornis sclateri* Taczanowski, 1874, Maraynioc, central Peru.
Genus sometimes merged with *Ampelion*, but differs in bill structure and juvenile plumage. Both genera, along with *Zaratornis*, appear to form a clade, which suggested by anatomical research and recent genetic data as being closely related to *Phytotoma*. Monotypic.
Distribution. E slopes of Andes in C Peru.
Descriptive notes. 21·5 cm; male 54-69 g, female 53-67 g. Male has black lores, forehead and crown, maroon-chestnut nuchal crest (usually concealed or semi-concealed); grey face, throat and



mantle, becoming dark greyish on rest of upperparts, browner on wings and tail; underparts brown, undertail-coverts brighter, reddish-brown; iris grey; upper mandible black, lower mandible blue-grey with black tip; legs dark grey. Distinguished from similar *D. remseni* by paler head, duller lower underparts. Female differs from male in having forehead and crown grey, only lores black. Juvenile has breast and belly clay-coloured with indistinct olive-brown streaks; immature unrecorded. Voice. Rasping "shhh", varying in length and intensity.
Habitat. Temperate-zone cloudforest, at or near tree-line; 2500-3600 m.
Food and Feeding. Mainly fruits; also insects.
Breeding. Occupied nest seen in Apr or May, c. 4 m above ground on fork of slender tree branch. No further details.
Movements. Resident; extremely sedentary, individuals often remain in same small patch of trees for weeks.
Status and Conservation. Not globally threatened. Restricted-range species: present in Northeast Peruvian Cordilleras EBA. Known range small, and apparently present in low numbers where found. These factors, combined with threat of habitat destruction, suggest need for monitoring.
Bibliography. Clements & Shany (2001), Cracraft (1985), Fjeldså & Krabbe (1990), Hellmayr (1929), Meyer de Schauensee (1982), Parker *et al.* (1982), Rasmussen *et al.* (1996), Ridgely & Tudor (1994), Robbins *et al.* (1994), Stotz *et al.* (1996), Zimmer (1936a).

8. **Chestnut-bellied Cotinga**

Doliornis remseni

French: Cotinga de Remsen **German**: Kastanienbauchkotinga **Spanish**: Cotinga de Remsen

Taxonomy. *Doliornis remseni* Robbins *et al.*, 1994, Cerro Mongus, Carchi, Ecuador.
Genus sometimes merged with *Ampelion*, but differs in bill structure and juvenile plumage. Both genera, along with *Zaratornis*, appear to form a clade, which suggested by anatomical research and recent genetic data as being closely related to *Phytotoma*. Monotypic.
Distribution. C Andes of Colombia (Quindío) and locally in E Andes of Ecuador.



Descriptive notes. 21·5 cm; male 58·5-72 g, one female 64 g. Male has black top of head, dark orange-red nuchal crest (usually concealed or mostly so); rest of head dark grey, upperparts darker, blackish; breast dark greyish, rest of underparts rich rufous-chestnut; iris dark red-brown; bill slate-grey to black; legs dark grey to black. Distinguished from similar *D. sclateri* by darker head, rich rufous-chestnut lower underparts. Female differs from male in having extensive grey feather fringes on head. Immature is like adult. Voice. Not recorded.
Habitat. Stunted woodland at or near tree-line; 2900-3650 m, mostly above 3100 m.
Food and Feeding. Only recorded food items are fruit, including those of *Escallonia* and *Miconia chlorocarpa*.
Breeding. No information.
Movements. None recorded.
Status and Conservation. VULNERABLE. Restricted-range species: present in Central Andean Páramo EBA. First discovered in 1989; currently known from only six localities, one in Colombia and remaining five in Ecuador. Rare and extremely local, and total population probably small; in Colombia, 0·3 individuals/10 km in transect counts. Species' preferred habitat highly fragmented, as large areas of suitably dense thickets already destroyed. Habitat loss and degradation continuing, mainly through uncontrolled burning; grazing, firewood-gathering and cultivation are further threats. Occurs in Cañón del Quindío National Park, in Colombia, and Podocarpus National Park and Guandera Biological Reserve, in Ecuador, but other sites have no protection at all. Extensive further field investigation required in order to gain more accurate information on this species' precise distribution and status. Reported as occurring in extreme N Peru, in Cordillera Las Lagunillas, but that range is in extreme S Ecuador.
Bibliography. Anon. (1995a), Best *et al.* (1997), Bloch *et al.* (1991), Collar *et al.* (1994), Cresswell *et al.* (1999), Granizo *et al.* (1997), Guerrero (2002b), Rasmussen *et al.* (1996), Renjifo (1994), Ridgely & Greenfield (2001), Robbins *et al.* (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996), Wege & Long (1995).

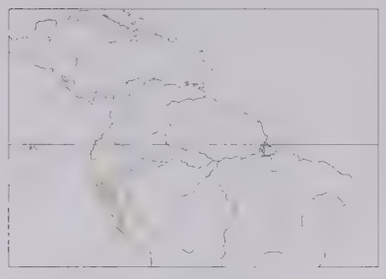
Genus *ZARATORNIS* Koepcke, 1954

9. **White-cheeked Cotinga**

Zaratornis stresemanni

French: Cotinga à joues blanches **German**: Weißohrkotinga **Spanish**: Cotinga Cariblanco

Taxonomy. *Zaratornis stresemanni* Koepcke, 1954, River Rímac, Lima, Peru.
Genus sometimes merged with *Ampelion*, but differs in details of skull structure and has distinct plumage. Both genera, along with *Doliornis*, appear to form a clade, which suggested by anatomical research and recent genetic data as being closely related to *Phytotoma*. Monotypic.
Distribution. Andes of W Peru (La Libertad S locally to Ayacucho).
Descriptive notes. 21 cm; male 46-57 g, female 47-55 g. Has black cap, white face, grey at rear auriculars; upperparts dark brown with brownish-buff streaks; median and lesser wing-coverts as back, greater coverts and remiges dusky with very narrow pale edges; tail mostly dusky; neck and



chin to upper breast brownish-grey; rest of underparts cinnamon-buff with bold blackish streaks, less marked in centre; iris red; bill lead-blue, paler towards tip; legs dark brown to blackish. Sexes alike. Immature undescribed. VOICE. Main call a loud, low-pitched series of notes, nasal in quality, "reh-reh-reh-reh-rrrrrrrrrr-re-re", speeding up to a roll towards middle, ending with 2-3 emphatic notes, lasting on average 4 seconds; drawn-out "raaa-aaah" when disturbed or alarmed.

Habitat. High-altitude woodland, mainly of *Polylepis-Gynoxys*, at 3250-4250 m; presumed non-breeders also recorded in mixed woodland down to 2000 m in dry season.

Food and Feeding. Primarily fruits of mistletoes (of genera *Tristerix*, *Ligaria*); an individual recently observed to eat the buds of a shrub subsequently identified as *Berberis lutea*. Seems almost wholly dependent on mistletoes, as few or no other fruit-producing plants occur in its main habitat. Plucks food items while perched.

Breeding. Laying in Apr-May. Nest a deep cup of mosses and lichens, with a few small twigs, lined with coarse grasses, well hidden within large clump of mistletoe (*Tristerix*) 4-7 m above ground on *Polylepis* tree. Clutch 3 eggs; incubation and fledging periods not recorded.

Movements. Probably resident in breeding habitat (*Polylepis* woodland), with some post-breeding dispersal to lower levels; in Aug-Nov dry season, presumed non-breeders recorded in mixed woodland at 2500-2900, irregularly down to 2000 m.

Status and Conservation. VULNERABLE. Restricted-range species: present in Peruvian High Andes EBA. Locally common but patchily distributed. Global population small, estimated at 1500-6000 individuals in 1992; largest known population at Pueblo Quichas, c. 500 individuals in 1987. *Polylepis* woodland, on which it is dependent, is patchily distributed and locally subject to felling, as well as cutting for firewood and charcoal; also, woodland regeneration often prevented by heavy grazing pressure and uncontrolled fires. Occurs in Huascarán National Park in N (Ancash) and Pampa Galeras National Reserve in S (Ayacucho), but protection of habitat inadequate in both. This species is probably the main dispersal agent for *Tristerix* and *Ligaria* mistletoes within its range.

Bibliography. Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Fjeldså & Krabbe (1990), Koepcke (1954, 1955, 1970), Maynard & Waterton (1998), Meyer de Schauensee (1982), Parker (1981), Plenge (1979), Pulido (1991), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996).

Genus *LANIISOMA* Swainson, 1832

10. **Elegant Mourner**

Laniisoma elegans

French: Cotinga élégant **German**: Schwarzkappenkotinga **Spanish**: Cotinga Elegante
Other common names: Shrike/Shrike-like Cotinga; Buckley's Mourner, Andean Laniisoma (Andean races)

Taxonomy. *Ampelis elegans* Thunberg, 1823, mountains of Rio de Janeiro, Brazil.

Phylogenetic affinities uncertain. Traditionally included within present family, but recent analysis of morphology indicated possible relationship with genera currently placed in Pipridae (*Schiffornis*) and Tyrannidae (*Laniocera*, *Xenopsaris*, *Pachyramphus*), possibly also with cotingid genus *Iodopleura*; further research required. Andean races (*venezuelense*, *buckleyi*, *cadwaladeri*) often treated as a separate species, but no apparent vocal differences from nominate and plumage differences considered minor. Four subspecies recognized.

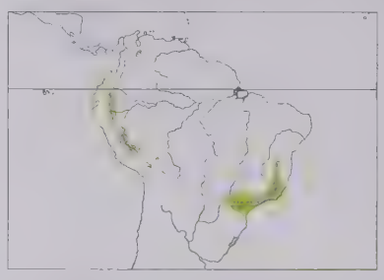
Subspecies and Distribution.

L. e. venezuelense Phelps, Sr & Gilliard, 1941 - foothills of E Andes in W Venezuela (Táchira, Barinas) and Colombia (Boyacá).

L. e. buckleyi (P. L. Sclater & Salvin, 1880) - foothills of Andes in Ecuador and Peru.

L. e. cadwaladeri Carriker, 1935 - foothills of Andes in NW Bolivia (La Paz).

L. e. elegans (Thunberg, 1823) - SE Brazil (S Bahia S to São Paulo and E Paraná).



Descriptive notes. 17·5-18 cm; male 41-46 g, two females 45·8 g and 51 g (*buckleyi*). Distinctive, with rather long bill with straight culmen ridge, abruptly hooked at tip, rictal bristles well developed; tarsus slender, outer toe partly united with middle toe. Male nominate race has black cap, olive-green upperparts, wing and tail; primary P7 attenuated distally and slightly recurved, projecting beyond P6 and P8; yellow below, some black spots on throat, becoming bars downwards; iris dark brown; upper mandible blackish, lower yellowish-horn; legs brownish to greyish-olive. Female is similar to male, but cap not solidly black, underparts more extensively barred, primaries not modified. Immature resembles female, but wing-coverts broadly tipped cinnamon. Races vary only slightly: *buckleyi* male is smaller than nominate, brighter, less extensively barred below, female has crown more or less concolorous with back, well-barred underparts; *cadwaladeri* resembles previous, male possibly even less barred below; *venezuelense* differs from last in slightly brighter upperparts, less heavily barred flanks. VOICE. Territorial call of male a very thin, high-pitched "psiiiiiiieeeee", regularly repeated.

Habitat. Humid forest and mature secondary woodland; often near streams in Andean foothills. Mainly 400-1800 m, but down to 200 m in Venezuela; in SE Brazil mostly to c. 900 m, and locally below 100 m in extreme S (Ilha do Cardoso).

Food and Feeding. Fruit and insects; few details, but berries of Melastomataceae recorded. Regularly clings to vertical perches, sometimes descending close to ground, but degree to which this associated with foraging uncertain. Occasionally joins mixed-species flocks; also observed together with *Phibalura flavirostris* in SE Brazil.

Breeding. No definite information available. Gonad data suggest breeding probably occurs in austral spring-summer in SE Brazil, but individuals also recorded in moult during this period. Two undated nestlings, collected in E Ecuador during 19th century, have long, filamentous white-tipped down feathers, suggesting cryptic adaptation (perhaps resembling fruiting moss) to an exposed nest.

Movements. In SE Brazil (nominate race), moves from interior forests to lowlands in austral winter; presumed passage migrants recorded São Paulo city in May (hitting house) and Oct (in city park). Apparently resident in Andes.

Status and Conservation. Not globally threatened. Nominate race classed as Vulnerable. Generally rare and local in both W & E parts of range; although easily overlooked and probably underrecorded, it seems to occur in very low densities in the relatively few places where known to be present. Rare in SE Brazil (nominate race), where increasingly substantial deforestation and habitat fragmentation have led to decline in numbers, and only few recent records; occurs in more than ten reserves, including three national parks (Itatiaia, Tijuca, Serra da Bocaína), but effective protection of these is rarely guaranteed. In Andes, rare in N part of range (*venezuelense*), with only six specimens from Venezuela (where no recent records) and one record from Colombia; thought to be almost certainly more widespread than is currently known. Farther S, race *buckleyi* is rare to very rare in Ecuador (classified as "Near-threatened" in that country), with records from no more than c. 12 localities, including single report from Podocarpus National Park; rare in Peru. Bolivian *cadwaladeri* very poorly known, with only two definite observations; one seen in Pilón Lajas Biosphere Reserve in Sept 1999. Andean races, if treated as a separate species, probably merit the conservation status of Vulnerable.

Bibliography. Anciães *et al.* (2001), Carriker (1933), Collar & Andrew (1988), Collar *et al.* (1992), Cracraft (1985), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Hinojosa *et al.* (1998), Lo (1994), Mallet-Rodrigues & Marinho (2003), Prum & Lanyon (1989), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ruschi (1979), Sick (1993, 1997), Snow (1975b), Stattersfield & Capper (2000), Stotz *et al.* (1996), Thoresen (1974), Williams (2002b)

PLATE 2 ➤



PLATE 2

inches 4

cm 10

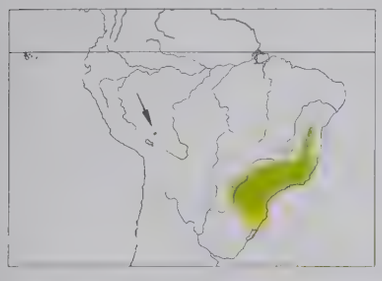
Genus *PHIBALURA* Vieillot, 1816

11. Swallow-tailed Cotinga

Phibalura flavirostris

French: Cotinga à queue fourchue **German**: Gabelschwanzkotinga **Spanish**: Cotinga Tijereta

Taxonomy. *Phibalura flavirostris* Vieillot, 1816, Rio de Janeiro, Brazil.
Geographically isolated race *boliviana* rather distinctive, may represent a separate species. Two subspecies recognized.
Subspecies and Distribution.
P. f. flavirostris Vieillot, 1816 - SE Brazil (from C Bahia, S Goiás, Minas Gerais and Espírito Santo S to Rio Grande do Sul), E Paraguay and NE Argentina (Misiones).
P. f. boliviana Chapman, 1930 - foothills of Andes in W Bolivia (vicinity of Apolo, in La Paz).



Descriptive notes. 21·5-22 cm; one male 43·5 g, two females 44 g and 52 g. Highly distinctive cotingid with long and forked tail, outer rectrices progressively longer and more pointed, rather long and pointed wing, very short, broad-based bill, bristly feathers around base of upper mandible and a few at base of lower mandible; legs and feet slender. Male nominate race has top of head black, with grey on side of crown, some dark red on rear crown, black ear-coverts; upperparts spotted olive and black (looking barred), wings and tail mostly bluish-black; throat yellow (feathers with short shafts and long barbs, brush-like); neck and chest white with black bars and spots; rest of underparts white with ochraceous scaling, some black markings; iris dark chestnut-brown, orbital ring pink or reddish; bill pale straw-coloured to pale fleshy yellow; legs dull pink. Female is similar to male but duller, more olive on wings, more extensive black markings (bar-like) below. Immature is like adult, but black areas duller and browner, barring on underparts heavier, throat feathers black-spotted, wing and tail feathers green-edged. Race *boliviana* differs from nominate in having wider, unmarked white postauricular area, longer tail, less yellow on throat, less barring below, feet more orange-toned, also less sexually dimorphic. Voice. Generally silent; two calls recorded for nominate race are a high guttural whistle and, without further detail, a "tremolo"; for *boliviana* a succession of harsh but rather weak notes, at c. 1-second intervals.
Habitat. Forest borders, partially wooded areas, and open areas and gardens with trees, from near sea-level to 2000 m; often nests in gardens in Brazil. Bolivian race (*boliviana*) inhabits open humid forest and forest fragments at 1400-2000 m.
Food and Feeding. Mainly fruits, also insects. Fruits especially of various mistletoe species (Loranthaceae), also of Myrsinaceae and Rubiaceae, recorded for nominate race; those of *Didymopanax morototoni* (Araliaceae) recorded for *boliviana*. Insects usually taken in flight, often by hawking; is the most aerial member of the family. Forages in loose groups of 15-20 individuals outside breeding season; sometimes associates with *Laniisoma elegans* in SE Brazil.
Breeding. Laying in Oct-Jan and adult with juvenile in Dec in Brazil; laying in Sept-Oct in Bolivia. Male possibly helps female to build nest, a small shallow cup made mainly or entirely of lichens, placed either in fork or on thick horizontal branch of tree, 2-18 m above ground in Brazil, 1·4-1·8 m above ground in Bolivia. Clutch 2-3 eggs; incubation by female, possibly assisted by male, which said also to feed her on nest, period not documented; both sexes feed nestlings, fledging period not recorded.
Movements. Brazilian population partially migratory, present in extreme S (Rio Grande do Sul) only between late Sept and late Mar, moving N after breeding; farther N, in main part of range, makes post-breeding movement from mountains down to lower levels. Resident in Bolivia.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Generally rare, locally uncommon, nowhere very common. Nominate race is locally uncommon in Itatiaia National Park (Minas Gerais-Rio de Janeiro border) and in Intervales State Park (São Paulo), also in Caraça area of Minas Gerais, but apparently rare elsewhere, even in protected areas (e.g. Serra dos Órgãos National Park); records in S Goiás and in Chapada Diamantina National Park (Bahia) possibly involve non-breeding migrants from S; very rare in Argentina (Misiones) and no recent records from Paraguay. This race is believed to have declined, but reasons not clear; although extensive deforestation has occurred within its range, it is not dependent on primary forest and is able to use man-made habitats; indeed, it seems to prefer forest borders and lightly wooded areas, and often nests in gardens with scattered trees (a habit unique among cotingids), which should ensure future survival of, at least, Brazilian population. Reported, surprisingly, as sometimes hunted for food in Brazil. Bolivian race (*boliviana*), rediscovered as recently as 2000, 98 years after original discovery, is apparently confined to a restricted area (possibly of less than 50,000 ha) of open forest and humid forest fragments around city of Apolo; receives some protection, as part of area is within Madidi National Park. If recognized as a distinct species, it should be considered globally threatened.
Bibliography. Bromfield *et al.* (2004), Canevari *et al.* (1991), Chebez (1994), Chebez *et al.* (1999), Collar & Andrew (1988), Cracraft (1985), Descourtilz (1983), Forrester (1993), Fraga & Narosky (1985), Goeldi (1894), Guix *et al.* (1992), Hayes (1995), Hellmayr (1929), Hennessey (2002), Krabbe (1984), Mazar Barnett & Pearman (2001), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Parrini *et al.* (1999), de la Peña (1989), Ridgely & Tudor (1994), do Rosário (1996), Saibene *et al.* (1996), Sick (1993, 1997), Snow (1982), Stattersfield & Capper (2000), Stotz *et al.* (1996).

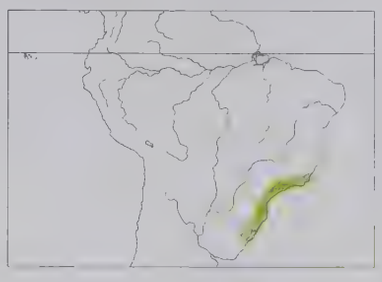
Genus *CARPORNIS* G. R. Gray, 1846

12. Hooded Berryeater

Carpornis cucullata

French: Cotinga coqueluchon **Spanish**: Cotinga Encapuchado
German: Braunmantel-Beerenfresser

Taxonomy. *Procnias cucullata* Swainson, 1821, Rio de Janeiro, Brazil.
Genus was in the past sometimes merged with *Ampelion*, but now considered distinct, and not even amongst closest relatives. Monotypic.
Distribution. SE Brazil, from Espírito Santo S to Rio Grande do Sul.



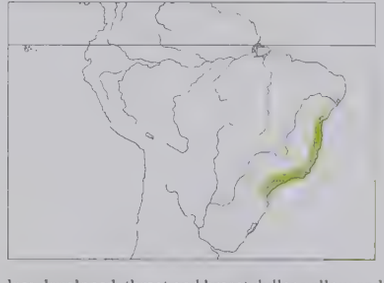
Descriptive notes. 22·5-23 cm; male 73·5-80 g, three females 67-84·4 g. Well-marked cotingid with rather long, square-cut tail. Male has black hood extending to hindneck and chest, narrow yellow hindcollar; back rather dark brown with chestnut tinge, rump and uppertail-coverts dull greenish-olive; wings and tail blackish with olive-green edgings, buffish-yellow tips of greater and median wing-coverts forming two wingbars; underparts from breast downwards yellow; iris dark brown, occasionally blue or fiery red; bill and legs mostly blue, grey-blue or violet-blue. Differs from *C. melanocephala* in upperpart colour, lack of barring below, also narrower and less dorso-ventrally compressed bill, relatively longer tail. Female is duller than male, head and body suffused or scaled with olive, more olive on wings and tail. Immature resembles female, but black on head even less developed, wing-coverts green (not blackish with green edges), throat and breast duller yellow and more barred. Voice. Male territorial call a stereotyped 4-syllable phrase, soft and mellow, "wo-op, wot-chuf"; both sexes make inward, grating notes.
Habitat. Humid lowland and montane forest, also palm groves; occurs at altitudinal range of 400-1600 m.
Food and Feeding. Mainly soft fruits; occasionally also large insects. Fruits on average of smaller size than those taken by *C. melanocephala*; in study at Intervales (São Paulo), fruits of 45 plant species (of 15 families) recorded in diet, average size 10·3 mm (range 4·2-22·3 mm). Usually solitary.
Breeding. No relevant information available. Data from moult, presumably post-breeding, suggest laying in Sept-Oct.
Movements. No information; probably sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Atlantic Forest Lowlands EBA. Poorly known species. Apparently rather uncommon throughout range, but this possibly due, at least in part, to its inconspicuous behaviour. In N of range, majority of suitable habitat in lowlands already destroyed, and species is now almost confined to montane forest. Occurs in several protected areas, including e.g. Serra dos Órgãos National Park, Augusto Ruschi Biological Reserve and Intervales and Serra do Mar State Parks. Main threats are continued agricultural expansion, human colonization and urbanization, and associated road-building.
Bibliography. Descourtilz (1983), Dinerstein *et al.* (1995), Forrester (1993), Gonzaga *et al.* (1995), Guix (1995), Guix *et al.* (1992), Hellmayr (1929), Mazar Barnett, Kirwan & Tobias (1998b), Meyer de Schauensee (1982), Parker *et al.* (1996), Pizo *et al.* (2002), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Venturini *et al.* (2001).

13. Black-headed Berryeater

Carpornis melanocephala

French: Cotinga à tête noire **German**: Olivmantel-Beerenfresser **Spanish**: Cotinga Cabecinegro

Taxonomy. *Procnias melanocephalus* Wied, 1820, Quartel das Barreiras, road from River Itapemirim to River Itabapoana, south Espírito Santo, Brazil.
Genus was in the past sometimes merged with *Ampelion*, but now considered distinct, and not even amongst closest relatives. Monotypic.
Distribution. E Brazil, locally in Alagoas (Murici) and from Bahia S along coast to NE Paraná.



Descriptive notes. 20·5-21 cm; two males 62·7 g and 66 g, 1 female 64 g. Male has black hood down to hindneck and lower throat, very thin yellow hindcollar; rather dull olive-green upperparts, wings and tail; underparts olive-yellow with weak and fine dark olive barring, plainer yellow on lower belly; iris fiery red or brick-red; bill blackish, plumbeous base of lower mandible; legs grey. Differs from *C. cucullata* in upperpart colour, barring below, also wider and more dorso-ventrally compressed bill, relatively shorter tail. Female is like male, some olive suffusion on head. Immature resembles female, but black on head less developed, throat and breast duller yellow and more barred. Voice. Male territorial call a loud, whistled "tuhweéo".
Habitat. Humid forest; occurs up to 500 m, and locally up to c. 700 m, but mostly found below 300 m. At one site in Espírito Santo (Linhares), found to favour dense vegetation, with many lianas and spiny palms, on dry sandy soil away from water; occurs also in tall *restinga* on Comprida I (São Paulo).
Food and Feeding. Predominantly fruits; a single record of a 7-cm stick-insect (Phasmida) being consumed. Fruits on average of larger size than those taken by *C. cucullata*; in observations at Intervales (São Paulo), fruits of 14 plant species (of 7 families), mainly those of Myrtaceae, recorded, with average width 14·8 mm (range 9·7-19·6 mm). The possibility that it plucks fruits while in flight more often than does *C. cucullata* is suggested by different bill shape and its lower wing-loading.
Breeding. No information. Vocal activity and gonad and moult condition of specimens indicate breeding probably in austral summer; moult data suggest more protracted season than that of *C. cucullata*.
Movements. No information.
Status and Conservation. VULNERABLE. Dependent on lowland forest, which has been extensively destroyed; total population probably low and clearly severely fragmented, and thought to have declined significantly. Currently confined almost exclusively to protected areas. Still locally fairly

On following page: 14. Green-and-black Fruiteater (*Pipreola riefferii*); 15. Band-tailed Fruiteater (*Pipreola intermedia*); 16. Barred Fruiteater (*Pipreola arcuata*).

common in a few places, particularly Murici Ecological Reserve (Alagoas), Linhares Natural Reserve (Espírito Santo) and Intervales State Park (São Paulo). Present also in two national parks (Monte Pascoal, Superagui), as well as three biological reserves and six other protected areas. Widespread clearance of forest remains a continuing problem in region, and harvesting of palmito palms (*Euterpe edulis*) may also be a threat; uncontrolled fires damage habitat, and forest at one site in Bahia was almost completely destroyed by fire in 1995. Official protection of forest at Murici a priority conservation target.

Bibliography. Aleixo & Galetti (1997), Anon. (1997c, 2002b), Collar & Andrew (1988), Collar *et al.* (1992), Cordeiro (2000), Cracraft (1985), Forrester (1993), Galetti & Aleixo (1998), Goerck (2001), Gonzaga *et al.* (1995), Guix (1995), Guix *et al.* (1992), Hellmayr (1929), Meyer de Schauensee (1982), Pizo *et al.* (2002), Ridgely & Tudor (1994), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Teixeira *et al.* (1988), Wege & Long (1995).

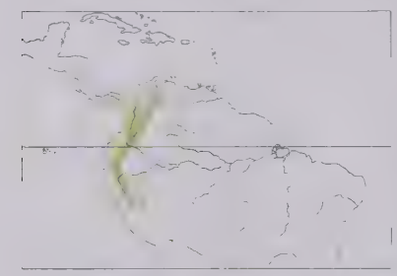
Genus *PIPREOLA* Swainson, 1838

14. Green-and-black Fruiteater

Pipreola riefferii

French: Cotinga vert et noir **German**: Goldbandkotinga **Spanish**: Frutero Verdinegro
Other common names: Black-headed/Huanuco/Tallmans' Fruiteater (*tallmanorum*)

Taxonomy. *Ampelis Riefferii* Boissonneau, 1840, "Bogotá", Colombia.
Closely related to *P. intermedia*, and has been treated as conspecific; in addition to differences in plumage (especially tail colour), however, the two overlap in range in C Peru and in some areas occur together, although they differ in altitudinal range. Distinctive race *tallmanorum*, from outlying mountains E of main Andean range, may merit species status. Race *confusa* possibly better merged with *chachapoyas*. Six subspecies recognized.
Subspecies and Distribution.
P. r. melanolaema P. L. Sclater, 1856 - mountains of NW & N Venezuela (S Lara S to C Táchira, and Aragua E to Miranda).
P. r. riefferii (Boissonneau, 1840) - Sierra de Perijá (on Colombia-Venezuela border), W Venezuela (W Táchira), and E & C Andes of Colombia.
P. r. occidentalis (Chapman, 1914) - W Andes (also extreme S end of C range) of Colombia and W slope in Ecuador.
P. r. confusa J. T. Zimmer, 1936 - E Andes of Ecuador and extreme N Peru (W Amazonas).
P. r. chachapoyas (Hellmayr, 1915) - N Peru E of R Marañón (in Amazonas and San Martín).
P. r. tallmanorum O'Neill & Parker, 1981 - Carpish Mts and Cerros de Sira, in Huánuco (Peru).



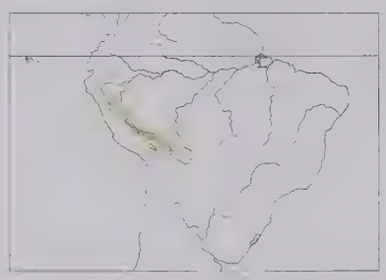
Descriptive notes. 17·5-20 cm; 46-61 g. Male nominate race has blackish-green hood down to chest, bordered by yellow collar (except on nape); green above, white tips of tertials; yellow below, with green streaks increasingly denser towards flanks; iris dark red-brown; bill bright red; legs red or orange-red. Distinguished from similar *P. intermedia* mainly by plainer tail, less patterned underparts. Female lacks hood and collar, has head and forebody to breast plain green. Juvenile is dark olive-green above, dull olive with yellow streaks below; adult plumage apparently acquired soon after fledging. Races differ mainly in size, and in shade of hood and amount of green markings on underparts of male: *melanolaema* has more contrasting wings, more solid yellow on central underparts, male hood glossy black (not greenish), female has ill-defined yellow collar; *occidentalis* male has throat and chest washed greenish, pale tertial tips less marked; *chachapoyas* is small, male hood black, underparts well marked with green streaks; *confusa* is like last, but male with more greenish upper breast and more strongly marked central underparts; *tallmanorum* is smallest, has brighter red eyes, male has glossiest black hood, unmarked yellow lower breast and belly, female lower underparts broadly streaked green. Voice. Very high-pitched, sibilant "ti-ti-ti-ti" for up to 5 seconds, dying away; call of *tallmanorum* distinct, "ti-ti-ti-seeee", last note very thin and high-pitched.
Habitat. Montane forest, forest borders and secondary woodland; mostly 1000-2900 m, locally higher, to 3050 m, exceptionally to 3300 m.
Food and Feeding. Apparently only fruit. In E Andes of Colombia, fruits of 16 plant species, from eight families, recorded, with those of Chloranthaceae, Ericaceae and Melastomataceae numerically most important. Plucks fruits while perched or during clumsy hover. Often accompanies mixed-species foraging flocks.
Breeding. Laying in Feb-Aug in W Colombia. Nest a substantial cup, almost entirely of moss, lined with black rootlets, placed 1-2 m above ground in bush or small tree. Clutch 2 eggs; no information on incubation and nestling periods.
Movements. None recorded.
Status and Conservation. Not globally threatened. Uncommon to fairly common or common. The most widespread and abundant of the Andean fruiteaters. Also, is ecologically the most tolerant. Occurs in several reserves and other protected areas.
Bibliography. Allen (1998), Arango (1990), Baez *et al.* (1997), Best *et al.* (1997), Bloch *et al.* (1991), Butler (1979), Chapman (1914), Chapman (1917c), Fjeldså & Krabbe (1990), Hilty (2003), Meyer de Schauensee (1982), Miller (1963), Moynihan (1979), O'Neill & Parker (1981), Parker (1997), Parker *et al.* (1985), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rutgers & Norris (1977), Schulenberg (2002), Schulenberg & Wust (1997), Stotz *et al.* (1996), Zimmer (1936a).

15. Band-tailed Fruiteater

Pipreola intermedia

French: Cotinga à queue rayée **German**: Schmuckbauchkotinga **Spanish**: Frutero Colifajado

Taxonomy. *Pipreola viridis intermedia* Taczanowski, 1884, Maraynioc, central Peru.
Closely related to *P. riefferii*, and has been treated as conspecific; in addition to differences in plumage (especially tail colour), however, the two overlap in range in C Peru and in some areas occur together, although they differ in altitudinal range. Two subspecies recognized.
Subspecies and Distribution.
P. i. intermedia Taczanowski, 1884 - E slope of Peruvian Andes, from La Libertad and San Martín S to Junín.
P. i. signata (Hellmayr, 1917) - E slope of Andes in SE Peru (Cuzco, Puno) and W Bolivia (La Paz, Cochabamba).



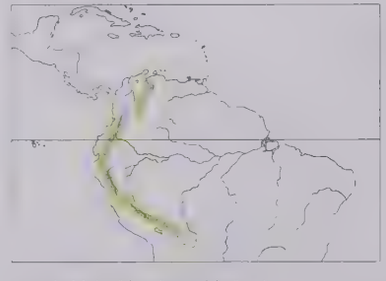
Descriptive notes. 19 cm; male 44-59 g, female 44-51 g. Male nominate race has blackish hood down to chest, obscure thin yellow collar (except on nape); green above, white tips of tertials, tail with black subterminal bar and white tip; yellow below, flanks green, with blackish markings giving scaled and spotted appearance; iris brown, sometimes grey; bill crimson, sometimes black culmen ridge; legs red or orange-red. Distinguished from similar *P. riefferii* mainly by tail pattern, more patterned underparts. Female lacks hood, has head and forebody to breast plain green, only faint hint of collar, also yellow eyering. Juvenile undescribed. Race *signata* male differs from nominate in having much more conspicuous yellow collar, central underparts bright yellow and almost unmarked. Voice. Very high-pitched trill, e.g. "tsi-tsi-tsi-tsiiii", 4-5 seconds long, similar to that of *P. riefferii*.
Habitat. Montane forest and forest borders; 2300-3100 m in Peru, 1100-2800 m in Bolivia.
Food and Feeding. Apparently only fruit.
Breeding. No information.
Movements. None recorded; individual recorded at lower elevation (1100 m) in Bolivia may indicate seasonal altitudinal movement.
Status and Conservation. Not globally threatened. Fairly common, but poorly known. Occurs in Madidi National Park, in Bolivia; in Peru, present in Machu Picchu Historical Sanctuary (Cuzco) and frequently observed at the Carpish Pass (Huánuco).
Bibliography. Clements & Shany (2001), Cracraft (1985), Fjeldså & Krabbe (1990), Hennessey, Herzog & Sagot (2003), Meyer de Schauensee (1982), Parker *et al.* (1982), Remsen & Traylor (1989), Ridgely & Tudor (1994), Stotz *et al.* (1996), Walker (2001), Zimmer (1936a).

16. Barred Fruiteater

Pipreola arcuata

French: Cotinga barré **German**: Bindenkotinga **Spanish**: Frutero Barrado

Taxonomy. *Ampelis arcuata* Lafresnaye, 1843, "Bogotá", Colombia.
Two subspecies recognized.
Subspecies and Distribution.
P. a. arcuata (Lafresnaye, 1843) - Sierra de Perijá (on Colombia-Venezuela border), and Andes of W Venezuela (E to SW Lara), Colombia, Ecuador and N & C Peru.
P. a. viridicauda Meyer de Schauensee, 1953 - Andes from C Peru (S from Junín) S to Bolivia (La Paz, Cochabamba).



Descriptive notes. 22-23 cm; 112-128 g. Distinctive, large fruiteater. Male has black hood down to chest; upperparts olive-green, large yellow spots on tertials and greater wing-coverts; tail with black subterminal bar, whitish tip; yellow with distinct black barring below; iris variably red, orange or yellow, in N Peru chestnut; bill crimson, sometimes black tip; legs scarlet. Female lacks black hood, and has head concolorous with back, entire underparts barred yellow and black. Juvenile undescribed. Race *viridicauda* differs from nominate in pale yellow to creamy white eyes, and considerably more green on outer tail feathers. Voice. Extremely high, thin, almost hissing "se-e-e-e-e-e-a-a-a-a", descending in pitch, lasting c. 2·5 seconds.
Habitat. Montane forest and forest borders; 1200-3350 m.
Food and Feeding. Apparently only fruit, taken while perched. Rarely joins mixed-species flocks.
Breeding. Fledglings in Jan in Bolivia and Jul in Ecuador. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Uncommon; much less numerous than *P. riefferii*, with which it overlaps extensively in range, altitudinal zone and habitat. Occurs in several protected areas, e.g. Sierra Nevada and Guaramacal National Parks, in Venezeula, Munchique National Park, in Colombia, and Podocarpus National Park, in Ecuador.
Bibliography. Baez *et al.* (1997), Best *et al.* (1997), Bloch *et al.* (1991), Butler (1979), Clements & Shany (2001), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Moynihan (1979), Ortiz & Carrión (1991), Parker (1997), Parker *et al.* (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Walker (2001), Williams & Tobias (1994).

PLATE 3 ➤



PLATE 3

inches 4
cm 10

17. Golden-breasted Fruiteater

Pipreola aureopectus

French: Cotinga à poitrine d'or **German**: Goldbrustkotinga **Spanish**: Frutero Pechidorado

Taxonomy. *Ampelis aureo-pectus* Lafresnaye, 1843, "Bogotá", Colombia.
Closely related to *P. jucunda*, *P. lubomirskii* and *P. pulchra*, and all sometimes treated as conspecific, but plumages distinct; geographical range overlap, but without intergradation, between present species and *P. jucunda* in SW Colombia (Nariño). Populations in S part of W Andes included in nominate, but possibly represent a separate, undescribed race. Three subspecies recognized.
Subspecies and Distribution.
P. a. decora Bangs, 1899 - Sierra Nevada de Santa Marta, in N Colombia.
P. a. aureopectus (Lafresnaye, 1843) - Andes of N & W Colombia and Venezuela (E to Lara), and Sierra de Perijá (on Colombia-Venezuela border).
P. a. festiva (Todd, 1912) - coastal range in N Venezuela (Carabobo E to Aragua).



Descriptive notes. 16·5-17·5 cm; one male 46 g, two females 46 g and 60 g. Male nominate race has dusky area on lores and chin, otherwise green above, tertials with small white tips; throat and central breast bright yellow, becoming lemon-yellow on central underparts, not sharply defined from green sides; iris orange-yellow; bill orange or orange-red; legs greenish-grey. Female is similar, but underparts green with yellow streaks. Juvenile undescribed. Race *decora* is smaller than nominate, has bright yellow band across side of neck; *festiva* male is more extensively yellow below. Voice. Main call a high, sibilant phrase up to 3 seconds long, rising and then slowly descending, before rising again at end, then short pause followed by two brief notes, described as "pseéééeeeeeeeeaaaeeeéét tic tic"; sometimes shorter version, as "seeeeeeéé".
Habitat. Humid montane and premontane forest; 800-3100 m.
Food and Feeding. Apparently only fruit. Often seen with mixed-species flocks.
Breeding. Eighteen birds from N Colombia in breeding condition in Jan-Jun, and one in Sept. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Fairly common but somewhat local across N part of range; apparently rare and decidedly local in Colombian Andes. Occurs in Henri Pittier National Park, in Venezuela, and Sierra Nevada de Santa Marta and Salamanca National Parks, in Colombia.
Bibliography. Cracraft (1985), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Rodner *et al.* (2000), Rutgers & Norris (1977), Stotz *et al.* (1996).

18. Orange-breasted Fruiteater

Pipreola jucunda

French: Cotinga jucunda **German**: Orangebrustkotinga **Spanish**: Frutero Pechinaranja

Taxonomy. *Pipreola jucunda* P. L. Sclater, 1860, Cachillacta, Pichincha, Ecuador.
Closely related to *P. aureopectus*, *P. lubomirskii* and *P. pulchra*, and all sometimes treated as conspecific, but plumages distinct; geographical range overlap, but without intergradation, between present species and *P. aureopectus* in SW Colombia (Nariño). Monotypic.
Distribution. W slope of W Andes in Colombia (S from S Chocó) and Ecuador (S to Guayas).



Descriptive notes. 18 cm. Male has glossy black hood, green upperparts, wings and tail; large fiery orange patch on chest extending narrowly to side of neck, bordered below by narrow black line at side; side of breast solid green, rest of underparts yellow, merging with green on flanks; iris light yellow to orange; bill orange to red; legs greenish-grey. Differs from *P. pulchra* in lacking green tinge on head, more fiery orange chest. Female is entirely green above and on chin and throat, rest of underparts streaked yellow and green. Juvenile undescribed. Voice. Extremely high-pitched, hissing "se-e-e-e-e-e-e-e", lasting 2-2·5 seconds; also loud high-pitched "eeest", repeated at short intervals.
Habitat. Occupies montane forest at 600-2300 m, mainly 1100-1300 m; favours very wet mossy forest.
Food and Feeding. Apparently only fruit, taken while perched or in clumsy hover. Occasionally in mixed-species flocks.
Breeding. One record of breeding in wild, in Colombia: female carrying food in Apr (laying probably in Mar), nest concealed within dense clump of vines. In captivity, clutch 2 eggs, incubation 16 or 17 days.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Chocó EBA. Uncommon to locally fairly common; most frequent in optimal habitat of mossy cloudforest in upper tropical zone. Occurs in La Planada Nature Reserve and Río Ñambí Natural Reserve, in Colombia.
Bibliography. Allen (1998), Best *et al.* (1997), Butler (1979), Chapman (1917c), Cracraft (1985), Hilty (1997), Hilty & Brown (1986), Lint & Dolan (1966), Meyer de Schauensee (1945, 1982), Ortiz & Carrión (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rutgers & Norris (1977), Salaman (1994), Samper (1992), Stotz *et al.* (1996), Strewe (2001).

19. Black-chested Fruiteater

Pipreola lubomirskii

French: Cotinga de Lubomirsk **German**: Schwarzkappenkotinga **Spanish**: Frutero Pechinegro

Taxonomy. *Pipreola lubomirskii* Taczanowski, 1879, Quebrada de Sance, 5800 feet [c. 1770 m], Tambillo, Peru.
Closely related to *P. aureopectus*, *P. jucunda* and *P. pulchra*, and all sometimes treated as conspecific, but plumages distinct, and no indication of intergradation. Monotypic.
Distribution. S Colombia (head of Magdalena Valley, and E slope of Andes) and E slope in Ecuador and Peru (S to N Cajamarca, including W slope in Zaña Valley).



Descriptive notes. 17-18 cm. Male has glossy black hood extending down to upper breast, green upperparts, wings and tail; side of breast solid green, rest of underparts yellow, merging with green on flanks; often, a broken black line from chest side to flank; iris yellow; bill orange-red to coral-red; legs greenish-grey to brownish-olive. Differs from *P. jucunda* in lacking orange chest patch; distinguished from similar *P. riefferii* by having no yellow collar, no white on wings, differently coloured iris and legs. Female is entirely green above and on chin to upper breast, rest of underparts streaked yellow and green, bill duller than male's, red to reddish-brown. Juvenile undescribed. Voice. High, very thin, protracted "pseeeeeeeét", stronger towards end; also shorter "pseeet".
Habitat. Montane forest at 1200-2300 m; 1500-2100 m in Ecuador.
Food and Feeding. Apparently only fruit; no details recorded.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Colombian Inter-Andean Slopes EBA and Ecuador-Peru East Andes EBA. Poorly known; apparently rare and local throughout range. Was formerly considered Near-threatened, implying need for further research; probably still merits inclusion in that conservation category. Until recently known only from E slope in N Peru, but during surveys in 1995-1997 found to be present also on W slope, at two sites in Zaña Valley (Cajamarca).
Bibliography. Barnes *et al.* (1997), Best *et al.* (1997), Butler (1979), Chapman (1917c), Cracraft (1985), Davies *et al.* (1994), Hilty & Brown (1986), Kirwan & Hornbuckle (1997c), Meyer de Schauensee (1945, 1982), Negret (2001), Parker *et al.* (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salinas *et al.* (2003), Stotz *et al.* (1996).

20. Masked Fruiteater

Pipreola pulchra

French: Cotinga masqué **German**: Gelbbrustkotinga **Spanish**: Frutero Enmascarado

Taxonomy. *Euchlornis pulchra* Hellmayr, 1917, Junín, Peru.
Closely related to *P. aureopectus*, *P. jucunda* and *P. lubomirskii*, and all sometimes treated as conspecific, but plumages distinct, and no indication of intergradation. Monotypic.
Distribution. E slope of Andes in Peru (Amazonas S to C Cuzco).



Descriptive notes. 18 cm; male 54-63 g, 2 females 42 g and 63g. Male has black hood tinged greenish (especially on nape), green upperparts, wings and tail; orange-yellow patch on chest extending narrowly to side of neck, bordered below by narrow black line; side of breast solid green, rest of underparts yellow, flanks broadly streaked green; iris yellow; bill red; legs greenish. Distinguished from very similar *P. jucunda* by green tinge on head, less fiery orange on chest. Female is entirely green above, streaked green and yellow below. Juvenile not described. Voice. High-pitched "psee-pseeee".
Habitat. Montane forest; 1500-2250 m.
Food and Feeding. Apparently only fruit; no details.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Ecuador-Peru East Andes EBA. Poorly known. Considered rare to uncommon; as with its congeners, however, it is lethargic and inconspicuous, and knowledge of its true status is very incomplete. Observed frequently at Machu Picchu Historical Sanctuary.
Bibliography. Clements & Shany (2001), Cracraft (1985), Meyer de Schauensee (1982), Parker *et al.* (1982), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1958), Walker (2001).

21. Scarlet-breasted Fruiteater

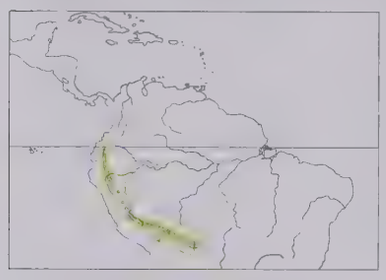
Pipreola frontalis

French: Cotinga chevalier **German**: Scharlachbrustkotinga **Spanish**: Frutero Pechirrojo
Other common names: Bluish-crowned/Bluish-fronted/Chapman's Fruiteater (*squamipectus*)

Taxonomy. *Euchlornis frontalis* P. L. Sclater, 1859, Samaipata, Santa Cruz, Bolivia.
Apparently closely related to *P. chlorolepidota*; speciation probably comparatively recent, but the two now exhibit extensive geographical overlap, although different altitudinal ranges. Race

On following pages: 22. Fiery-throated Fruiteater (*Pipreola chlorolepidota*); 23. Handsome Fruiteater (*Pipreola formosa*); 24. Red-banded Fruiteater (*Pipreola whitelyi*); 25. Scaled Fruiteater (*Ampelioides tschudii*).

squamipectus rather distinct, and separated from nominate by wide gap in N Peru; may perhaps merit full species status. Two subspecies recognized.
Subspecies and Distribution.
P. f. squamipectus (Chapman, 1925) - E slope of Andes from N Ecuador S to N Peru (S to San Martín).
P. f. frontalis (P. L. Sclater, 1859) - E slope from C Peru S to C Bolivia (W Santa Cruz).

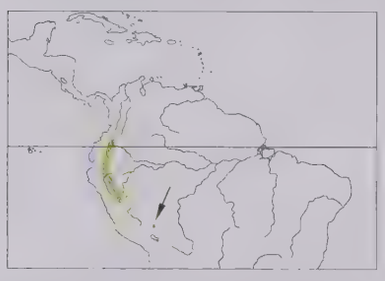


Descriptive notes. 15·5-16·5 cm; 39·5-45·3 g (*squamipectus*). Male nominate race has green head, face darker bluish-green, green upperparts, wings and tail, tertials with yellowish tips; large red patch on throat and breast, otherwise largely yellow below, green on flanks; iris pale yellow, sometimes orange-brown; bill and legs orange or orange-red to scarlet. Differs from *P. chlorolepidota* chiefly in colour of underparts. Female differs from male in having green head with some yellow on forehead and throat, breast nearly unmarked green, rest of underparts with more extensive green, giving scaled appearance around belly; also, bill and legs usually duller. Juvenile undescribed. Race *squamipectus* differs from nominate in wider bill, male with darker head and less red on throat, female with entire underparts barred dark green. Voice. A very thin, short "psiii".
Habitat. Montane forest at 1000-2300 m, mainly to 1700 m; has been recorded down to 670 m.
Food and Feeding. Apparently only fruit; no details. Joins mixed-species flocks.
Breeding. Single record from Ecuador. Nest found in Jan, a bowl-shaped structure c. 18 cm in diameter, made externally of moss and lichen, c. 15 m up astride fork of horizontal branch in subcanopy at forest edge; female on nest, but apparently no eggs or young.
Movements. None recorded.
Status and Conservation. Not globally threatened. Poorly known. Considered uncommon to locally fairly common, but inconspicuous behaviour possibly obscures its true status. Occurs in Podocarpus National Park, in Ecuador.
Bibliography. Aversa & Vallely (1999), Best *et al.* (1997), Butler (1979), Cracraft (1985), Jácome (2002c), Mee *et al.* (2002), Meyer de Schauensee (1982), Parker (1997), Parker & Wust (1994), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg (2002), Schulenberg & Wust (1997), Schulenberg *et al.* (2001), Stotz *et al.* (1996).

22. **Fiery-throated Fruiteater**
Pipreola chlorolepidota

French: Cotinga à gorge rouge **German**: Orangekehlkotinga **Spanish**: Frutero Gorgirrojo

Taxonomy. *Pipreola chlorolepidota* Swainson, 1838, vicinity of Moyobamba, San Martín, Peru.
Apparently closely related to *P. frontalis*; speciation probably comparatively recent, but the two now exhibit extensive geographical overlap, although different altitudinal ranges. Monotypic.
Distribution. E slope of Andes from S Colombia (Cauca, W Caquetá) S to C & SE Peru (S to Pasco, also isolated record in extreme E Puno).



Descriptive notes. 12-13 cm; one male 28 g, one female 31 g. The smallest fruiteater. Male has green head, often some dusky on face, green upperparts, wings and tail, small white tips on remiges and rectrices, large and conspicuous white tips on tertials; yellow to orange bib, becoming red on chest; rest of underparts green, yellowish on central belly; iris cream or greyish-white; bill orange with black tip; legs orange. Female lacks orange bib, is barred green and yellow below, more yellow on throat and more green on breast, has duskier bill. Voice. Very short, high-pitched "tsi".
Habitat. Humid forest of Andean foothills; 600-1500 m, in small numbers down to 300 m.
Food and Feeding. Little known. Recorded at fruit trees; probably wholly or predominantly frugivorous, like congeners. Follows mixed-species flocks.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Poorly known. Rare in most of range, locally uncommon at a few sites; recorded in only three places in Colombia. Possibly less rare than it appears to be; very inconspicuous behaviour may obscure its true status. Foothill forests within its range are under severe pressure, and many already converted to agriculture and cattle pasture; logging and other commercial activities (e.g. mining, oil exploration) are further threats. Occurs in Sangay National Park, in Ecuador.
Bibliography. Balchin & Toyne (1998), Butler (1979), Canaday (2002b), Cracraft (1985), Hilty & Brown (1986), Mee *et al.* (2002), Meyer de Schauensee (1982), Parker *et al.* (1996), Pearman (1994a), Restrepo *et al.* (2002), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg & Servat (2001), Stattersfield & Capper (2000), Stotz *et al.* (1996), Zimmer (1930).

23. **Handsome Fruiteater**
Pipreola formosa

French: Cotinga magnifique **German**: Weißfleckenkotinga **Spanish**: Frutero Hermoso

Taxonomy. *Ampelis formosa* Hartlaub, 1849, Caracas, Venezuela.
Three subspecies recognized.
Subspecies and Distribution.
P. f. formosa (Hartlaub, 1849) - mountains of N Venezuela from Falcón and Yaracuy E to Distrito Federal and Miranda.
P. f. rubidior (Chapman, 1925) - coastal mountains of N Venezuela in Anzoátegui, Sucre and Monagas.
P. f. pariae Phelps, Sr & Phelps, Jr, 1949 - mountains of Paria Peninsula, in NE Venezuela.
Descriptive notes. 16-18 cm; male 43-49 g, 2 females 41 g and 45 g. Rather distinctive, with prominent white on tertials. Male nominate race has black head and throat, green upperparts, wings and tail, contrasting large white tips of tertials; orange-red on chest becoming yellow downwards, flanks greenish; iris orange-yellow to brown; bill orange-red; legs greyish-olive. Female has head and throat green, distinct yellow crescent-shaped chest patch, rest of underparts finely barred green and yellow. Juvenile undescribed. Race *rubidior* has redder chest and smaller wing spots than nominate, female with dark-barred yellowish throat; *pariae* has even brighter and more extensive red on chest. Voice. A high, thin "pik" and "ti-ti-ti-ti-ti-ti..."; song a high "peeéé-eeeeeee-e-e-e-e", loudest near start, slowing at end.



Habitat. Humid to wet premontane and montane forest; 800-2200 m.
Food and Feeding. Mostly small fruits, taken either while perched or in short upward sally with momentary hover. Sometimes briefly joins mixed-species flocks.
Breeding. No direct information. Moult (presumably post-breeding) begins mainly May-Jul, indicating breeding in early months of year.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Caripe-Paria Region EBA and Cordillera de la Costa Central EBA. Fairly common to common, and the most numerous of the five Venezuelan fruiteaters; common in Paria Peninsula (race *pariae*). Occurs in Henri Pittier National Park. Often markedly tame, allowing close approach.
Bibliography. Bond *et al.* (1989), Cracraft (1985), Hilty (2003), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Rodner *et al.* (2000), Stotz *et al.* (1996), Visbal *et al.* (1996), Wetmore (1939).

24. **Red-banded Fruiteater**
Pipreola whitelyi

French: Cotinga cordon-rouge **German**: Brustbandkotinga **Spanish**: Frutero Degollado

Taxonomy. *Pipreola whitelyi* Salvin and Godman, 1884, Cerro Roraima, Venezuela.
Two subspecies recognized.
Subspecies and Distribution.
P. w. whitelyi Salvin & Godman, 1884 - extreme SE Venezuela and adjacent Guyana (on mountains Roraima, Twek-quay and Kowa).
P. w. kathleenae J. T. Zimmer & Phelps, Sr, 1944 - tepuis W of Cerro Roraima, in SE Venezuela.



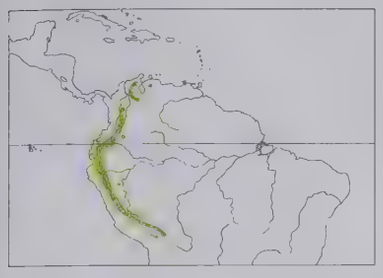
Descriptive notes. 16·5-17 cm. The most distinctive species in genus. Male nominate race has tawny-buff to rufous lowermost forehead, supercilium and cheek; rather dark greyish-green above, wings and tail contrastingly rufous-brown; red crescent-shaped band across chest, becoming tawny on neck side; rest of underparts grey, undertail-coverts ochre; iris orange-red; bill and legs red. Female is duller above than male, underparts entirely yellowish-white with blackish streaks, has yellowish eyes, duller bill and legs. Juvenile is conspicuously spotted on upperparts. Race *kathleenae* differs from nominate in having more extensive yellowish on forehead, female with blacker stripes below. Voice. Drawn-out, very high and thin "pss-ee-ee-ee-ee-ee-ee", c. 2-3 seconds long, given at long intervals; also high, thin "ti" notes, often in short series, when excited.
Habitat. Montane forest; 1300-2250 m. Prefers mossy forest, also dense stunted secondary growth dominated by melastome (Melastomataceae) trees.
Food and Feeding. Apparently only fruit; no details. Sometimes joins mixed-species flocks.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tepuis EBA. Considered rare to uncommon, but is easily overlooked; in Venezuela, possibly most numerous on Cerro Ptari (race *kathleenae*). Much of its range is difficult of access, and not at present under threat. Occurs in Canaíma National Park, in Venezuela.
Bibliography. Barnett *et al.* (2002), Chapman (1931), Cracraft (1985), Hilty (2003), Mayr & Phelps (1967), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Prum (1988), Ridgely & Tudor (1994), Rodner *et al.* (2000), Snyder (1966), Stotz *et al.* (1996), Zimmer & Phelps (1944).

Genus *AMPELIOIDES* J. Verreaux, 1867

25. **Scaled Fruiteater**
Ampelioides tschudii

French: Cotinga écaillé **German**: Schuppenkotinga **Spanish**: Frutero Escamoso

Taxonomy. *C[otinga] Tschudii* G. R. Gray, 1846, Pangos, east of Tarma, Junín, Peru.
Possibly most closely related to *Pipreola*. Monotypic.
Distribution. Sierra de Perijá (on Colombia-Venezuela border), and locally in Andes from Venezuela (Lara, SE Tachirá) and N Colombia S to NW Bolivia (La Paz, W Beni); also coastal ranges of Ecuador, in W Esmeraldas and Guayas (Loma Alta), in W Ecuador; also, locally, E of Andes in Colombia (Sierra de Macarena) and Peru (Cordillera Azul).
Descriptive notes. 19-20 cm; male 74-95 g, female 71·5-80 g. Distinctive cotingid, with bill broad at base, upper mandible somewhat swollen laterally, tarsus without scutellation along posterior surface. Male has glossy black cap to nape, auriculars and gape; lores whitish, moustachial stripe yellowish-white, joining pale yellow hindcollar; upperparts blackish, scaled olive, yellow tips on some uppertail-coverts; wings blackish, large olive tips of tertials, entirely olive greater



wing-coverts (conspicuous wide wingband), median and lesser coverts narrowly scaled olive, white outer edges of some outer primaries; short tail mostly olive, subterminal black bar, outer rectrices black, narrow creamy white tips; chin and throat whitish, weakly scaled, separated from moustachial area by ill-defined blackish streak; variable black band on lower neck side and chest side; rest of underparts pale yellow, broadly scaled with olive; iris amber-yellow to golden-yellow, sometimes with red inner ring; upper mandible mostly black, lower mandible pale olive to greyish; legs olive-grey or bluish-grey, dull yellow soles. Female has black of head replaced by olive, collar and face markings less bold, upperparts and wing-coverts less extensively blackish, thus more olivaceous appearance above, scaling below blackish, more contrasting, eyes duller, sometimes olive-green. Immature has feathers of upperparts extensively pale-tipped. Voice. Territorial song a series of rather loud, downward-inflected whistles, initially rising, somewhat like call of raptor (Accipitridae). Rattling wing noise in flight.

Habitat. Humid montane forest; mostly at 900-2700 m; 575-750 m in W Ecuador (Loma Alta).
Food and Feeding. Mainly fruit and insects; arboreal snails (*Plekokeilas*) also eaten, apparently regularly in an area in Ecuador. Fruits in stomach contents measured 10 × 10 mm; bill shape suggests that fruits taken are large in relation to bird's size; male seen to feed immature with orange-coloured fruit c. 2·5 cm in diameter, also to regurgitate black fruits half the size of its own bill. Searches for insects along horizontal epiphyte-covered branches. Arboreal snails taken from underside of tree branches in upward sally, beaten against branch to remove outer lip of aperture, then swallowed whole. Regularly accompanies mixed-species foraging flocks.
Breeding. Male feeding immature in mid-Nov in Bolivia. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Generally rare or uncommon; rather few records from Venezuela; locally more numerous in Ecuador. Although more active than *Pipreola* fruiteaters, is also more wary and hence difficult to see; likely to be similarly under-recorded. Occurs in several protected areas, including La Planada Nature Reserve and Río Ñambí Natural Reserve, in Colombia, and Madidi National Park, in Bolivia.
Bibliography. Allen (1998), Aveledo & Pons (1952), Becker & López (1997), Best *et al.* (1997), Butler (1979), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hilty (1997, 2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Parker *et al.* (1980), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ryan (2000), Salaman (1994), Schulenberg & Servat (2001), Schulenberg *et al.* (2001), Stotz *et al.* (1996), Strewe (2000b), Williams (2002a), Williams & Tobias (1994), Zimmer (1930).



PLATE 4

inches 4
cm 10

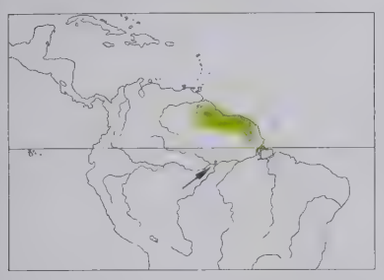
Genus *IODOPLEURA* Lesson, 1839

26. **Dusky Purpletuft**

Iodopleura fusca

French: Cotinga brun **German**: Braunkopf-Zwergkotinga **Spanish**: Cotinguita Oscuro
Other common names: Dusky Cotinga

Taxonomy. *Ampelis fusca* Vieillot, 1817, Cayenne.
Genus has been suggested, on basis of morphological analysis, as possibly belonging to an assemblage containing *Laniisoma* and genera currently placed in Pipridae (*Schiffornis*) and Tyrannidae (*Laniocera*, *Xenopsaris*, *Pachyramphus*); traditional placement within present family considered preferable, pending further study. Species is closely related to, and forming a superspecies with, *I. isabellae*; possibly conspecific, but differences comparable to those between other species pairs within family and treatment as separate species seems justified. Monotypic.
Distribution. E & SE Venezuela, the Guianas, and adjacent N Brazil (Roraima and probably farther S, to Manaus area, also Amapá).



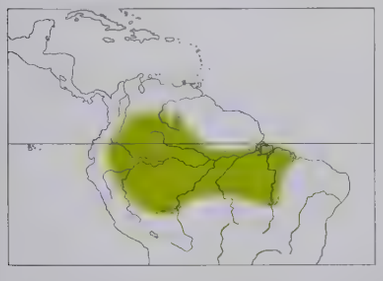
Descriptive notes. 11 cm; one male 15·3 g. Small cotingid with relatively long hirundinid-like wings, short tail extending only 5-10 mm beyond tail-coverts, wide bill slightly expanded at base, hooked at tip. Male slaty blackish above, white band on rump; underparts smoky brown, white centrally, with small tuft of violet feathers on upper flank; iris dark brown; upper mandible black, lower mandible lead-grey; legs dark lead-grey. Smaller than *I. isabellae*, much darker, lacks white on head, throat and flanks. Female has flank tuft white. Juvenile has conspicuously white-tipped feathers; moults into plumage indistinguishable (or nearly so) from full adult plumage. Voice. Soft trilled notes and high, thin notes, similar to those of *I. isabellae*.
Habitat. Canopy and borders of humid forest; to 500 m.
Food and Feeding. Insects, taken in flight sallies from treetops; also fruit. No further details.
Breeding. Pair with fledglings in Feb in Venezuela. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Poorly known. Considered uncommon or rare, but probably under-recorded owing to difficulty of observation of small treetop birds in areas of unbroken forest. Occurs in Imataca Forest Reserve and El Dorado, in Venezuela.
Bibliography. Cohn-Haft *et al.* (1997), Cracraft (1985), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Meyer de Schauensee (1982), Prum (1988), Ridgely & Tudor (1994), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992).

27. **White-browed Purpletuft**

Iodopleura isabellae

French: Cotinga d'Isabelle **Spanish**: Cotinguita Cejiblanco
German: Weißbrauen-Zwergkotinga
Other common names: White-browed Cotinga

Taxonomy. *Iodopleura Isabellae* Parzudaki, 1847, San Carlos, Río Negro, south Venezuela.
Genus has been suggested, on basis of morphological analysis, as possibly belonging to an assemblage containing *Laniisoma* and genera currently placed in Pipridae (*Schiffornis*) and Tyrannidae (*Laniocera*, *Xenopsaris*, *Pachyramphus*); traditional placement within present family considered preferable, pending further study. Species is closely related to, and forming a superspecies with, *I. fusca*; possibly conspecific, but differences comparable to those between other species pairs within family and treatment as separate species seems justified. Two subspecies recognized.
Subspecies and Distribution.
I. i. isabellae Parzudaki, 1847 - W Amazon Basin and upper R Orinoco drainage in S Venezuela, SE Colombia, E Ecuador, E Peru, extreme N Bolivia (Pando), and Brazil (E to W Pará).
I. i. paraensis Todd, 1950 - E Amazon Basin in Brazil (E Para E from R Tocantins, S to N Goiás).



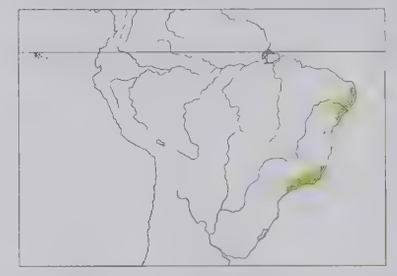
Descriptive notes. 11-12 cm; 19·8-20·2 g. Small cotingid with relatively long hirundinid-like wings, short tail extending only 5-10 mm beyond tail-coverts, wide bill slightly expanded at base, hooked at tip. Male nominate race has white lores, postocular stripe and moustachial area; rest of head, and upperparts, wings and tail, blackish-brown, white band on rump; underparts white, dusky brown on breast side and barring on flanks, small tuft of violet feathers on upper flank; iris dark brown; upper mandible black, lower mandible lead-grey; legs dark lead-grey. Female differs from male in having flank tuft white. Juvenile has feathers conspicuously white-tipped; moults into plumage indistinguishable (or nearly so) from full adult plumage. Race *paraensis* is darker above than nominate, and flanks more barred and mottled. Voice. Variety of mostly weak, high-pitched notes, mostly trilled or tittering, e.g. "tre-e-ed" and repeated rising "ueeéé"; also soft "sr'r'r" trills in series, weak "jee-jee-jee" and thin "ti-ti-ti-ti-ti-ti-ti" rattle.
Habitat. Canopy and borders of humid forest and secondary woodland; mostly below 500 m, in small numbers up to 900 m.
Food and Feeding. Insects, taken in flight sallies from treetops; also much fruit, including mistletoe berries (Loranthaceae), usually taken during brief hover, at times from perched position. Usually in pairs, or in small groups.
Breeding. One nest and records of dependent juveniles indicate laying in Sept-Dec in E Brazil (Belém area). Only nest found was a minute cup-shaped structure of vegetable fibres, thickly coated on outside with spider web, and fixed by spider web to slender horizontal branch 18-19 m up in crown of dead tree. No further information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Generally uncommon, but probably under-recorded owing to difficulty of observation of small treetop birds in areas of unbroken forest. Occurs in several protected areas, e.g. Cuyabeno Reserve (Ecuador) and Manu National Park and Biosphere Reserve, and Tambopata-Candamo Reserved Zone (Peru).
Bibliography. Allen (1995), Angehr & Aucca (1997), Bates *et al.* (1998), Best *et al.* (1997), Brooks *et al.* (1999), Butler (1979), Camargo & Camargo (1964), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Oren & Parker (1997), Ortiz & Carrión (1991), Poulsen (1992), Prum (1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1979a), Stotz *et al.* (1996), Terborgh *et al.* (1984), Willard *et al.* (1991), Zimmer & Hilty (1997), Zimmer *et al.* (1997).

28. **Buff-throated Purpletuft**

Iodopleura pipra

French: Cotinga manakin **German**: Fahlkehl-Zwergkotinga **Spanish**: Cotinguita Pipra
Other common names: Buff-throated Cotinga

Taxonomy. *Pardalotus pipra* Lesson, 1831, Sri Lanka; error = Rio de Janeiro, Brazil.
Genus has been suggested, on basis of morphological analysis, as possibly belonging to an assemblage containing *Laniisoma* and genera currently placed in Pipridae (*Schiffornis*) and Tyrannidae (*Laniocera*, *Xenopsaris*, *Pachyramphus*); traditional placement within present family considered preferable, pending further study. Two subspecies recognized.
Subspecies and Distribution.
I. p. leucopygia Salvin, 1885 - coastal NE Brazil in Paraíba, Pernambuco, Alagoas and Bahia.
I. p. pipra (Lesson, 1831) - coastal E Brazil in Espírito Santo, Rio de Janeiro and São Paulo.



Descriptive notes. 9·5 cm; 10 g. Small cotingid with relatively long hirundinid-like wings, short tail extending only 5-10 mm beyond tail-coverts, wide bill slightly expanded at base, hooked at tip. Male nominate race is grey above, darker on crown, sometimes some white on rump; wings and tail duskier; cinnamon-buff on throat, chest and undertail-coverts, grey side of breast, rest of underparts white with grey barring, small tuft of violet feathers on upper flank; iris dark brown; upper mandible black, lower mandible lead-grey; legs dark lead-grey. Female lacks violet tuft on flank. Juvenile has conspicuous white feather tips. Race *leucopygia* has white rumpband more developed, also purer (less greyish) and more extensive buff area on throat than nominate. Voice. High-pitched, faint "se-se-see", in flight sometimes repeated so rapidly as to become a short orthopteran-like trill; also a double whistle, "seee, fee".
Habitat. Humid forest, secondary woodland and cacao plantations; to 1000 m.
Food and Feeding. Mainly mistletoe berries (Loranthaceae), some other fruits; also small insects. Forages mainly high in trees, especially large fine-leaved leguminous trees often holding mistletoe clumps. Picks insects off vegetation or catches them in air.
Breeding. Recorded in Jul-Oct; two records of laying in Jul, in austral winter (unusual, but supported by records of moult beginning Aug-Sept); singing male in Dec in Espírito Santo. Nest a tiny cup, felted and whitish with darker blotches (probably of lichens), saddled on small peripheral twig c. 18 m above ground on high branch of leafless tree. Clutch 1 egg; incubation and fledging periods not known.
Movements. Little understood; probably some vertical seasonal movement. Found "migrating" in small flocks in Nov (austral summer) at 900 m in Espírito Santo, but breeding recorded at sea-level in winter.
Status and Conservation. ENDANGERED. Restricted-range species: present in Atlantic Slope of Alagoas and Pernambuco EBA and Atlantic Forest Lowlands EBA. Rare, and range highly fragmented. Recorded from only few sites. Only in recent years found to be surviving in some areas in SE Brazil, and small population discovered in NE Brazil; existence of N race *leucopygia* was for long obscured by mislabelling of the two specimens on which it was based as having originated from Guyana. Future survival of both races threatened by extensive destruction of lowland Atlantic Forest; the fact that it occurs in mainly lowland coastal forest renders it even more at risk than was previously thought, as this habitat is being cleared at a rapid rate. Occurs in Serra dos Órgãos National Park and Desengano and Serra do Mar State Parks; also in Ubatuba Experimental Station (São Paulo). Protection of forest at Murici (Alagoas) would greatly benefit this and other globally threatened species, e.g. *Carpornis melanocephala*.
Bibliography. de Almeida & Teixeira (1997), Anon. (1997c, 2002b), Camargo & Camargo (1964), Collar & Andrew (1988), Collar *et al.* (1992), Cracraft (1985), Descourtilz (1983), Forrester (1993), Mallet-Rodrigues & Marinho (2003), Mendoça & Gonzaga (2000), Meyer de Schauensee (1982), Prum (1988), Ridgely & Tudor (1994), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Teixeira *et al.* (1990), Tobias *et al.* (1993), Wege & Long (1995), Willis & Oniki (1988a).

Genus *CALYPTURA* Swainson, 1832

29. **Kinglet Calyptura**

Calyptura cristata

French: Cotinga roitelet **German**: Goldhähnchenkotinga **Spanish**: Cotinguita Reyezuelo
Other common names: Kinglet Cotinga

Taxonomy. *Pardalotus cristatus* Vieillot, 1818, Rio de Janeiro, Brazil.
Relationships uncertain. Monotypic.
Distribution. Rio de Janeiro area of SE Brazil.



Descriptive notes. 7·5-8 cm. Tiny, much the smallest cotingid, reminiscent of a kinglet (*Regulus*) except for conical bill with strongly arched culmen, very short tail. Male has black-bordered large orange-red crown patch, feathers somewhat elongated; bright olive above, rump yellow; wings and tail mostly dusky, tips of greater and median wing-coverts with obvious white bars, tertials also tipped white; underparts yellow, olive wash on breast; bare-part colours not recorded, bill and legs apparently dark. Female has reduced patch on crown. Juvenile undescribed. Voice. Not recorded.
Habitat. Forest and second-growth woodland, probably to c. 900 m; recently rediscovered at c. 550 m.
Food and Feeding. Insects and small fruits; according to old account, especially berries of a solanaceous shrub.
Breeding. No information.
Movements. None recorded.
Status and Conservation. CRITICAL. Restricted-range species: present in Atlantic Forest Lowlands EBA. Had not been recorded for over a century, and presumed extinct by many ornithologists. Remarkably, rediscovered in Oct 1996 on edge of Serra dos Órgãos National Park, c. 60 km N of city of Rio de Janeiro; two individuals observed on several occasions during 27th-30th Oct; despite intense searches at same and suitable nearly sites, no further sightings made. Believed to have been not uncommon in 19th century, as c. 50 specimens exist in museum collections (last one dated c. 1890); virtually all forest below 1000 m in the area has since been destroyed. Full protection of remaining lowland forest in the vicinity considered a priority conservation measure. Intensive surveys will, it is hoped, result in further observations of this almost unknown cotingid.
Bibliography. Collar & Andrew (1988), Cracraft (1985), Descourtilz (1983), Forrester (1993), Gonzaga (1997), King (1978/79), Meyer de Schauensee (1966, 1982), Pacheco & da Fonseca (2000, 2001), Ridgely & Tudor (1994), Scott & Brooke (1985), Sick (1972, 1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996).

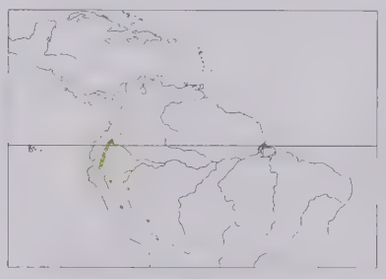
Genus *SNOWORNIS* Prum, 2001

30. **Grey-tailed Piha**

Snowornis subalaris

French: Cotinga à queue grise **German**: Grauschwanzpiha **Spanish**: Guardabosques Coligrís
Other common names: Grey-tailed Cotinga

Taxonomy. *Lipaugus subalaris* P. L. Sclater, 1861, River Napo, Ecuador.
Closely related to *S. cryptolophus*; both formerly placed in genus *Lipaugus*, but morphological study and recent analysis of DNA sequences indicate only remote relationship to latter; previously suggested placement in genus *Lathria*, but that name unavailable. Monotypic.
Distribution. E slopes of Andes locally in S Colombia, Ecuador, and Peru (San Martín, Pasco, S Madre de Dios).



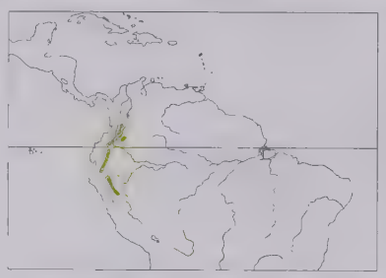
Descriptive notes. 23·5 cm; 1 male 86·3 g, 2 females 81·8 g and 82 g. Male has semi-concealed black feathers on crown; otherwise olive-green above, greyer on wings, grey on rump and tail; underparts paler olive-green, narrow pale shaft streaks on throat and breast, grey below; underwing-coverts yellow; iris dark brown, pale orbital ring; bill dark horn, paler base of lower mandible; legs grey. Differs from *S. cryptolophus* in relatively shorter legs, broader bill, grey tail and lower underparts, yellower underwing-coverts. Female lacks black on crown. Juvenile undescribed. Voice. Clear, ringing 2-note whistle, "churrrrrr-ee", delivered at long intervals; less often a shorter version, "chreeee".
Habitat. Humid forest in Andean foothills; 500-1400 m.
Food and Feeding. Insects and fruit. Insects taken from foliage in flight sallies, and by hover-gleaning; method of taking fruit not recorded. Rarely, associates with mixed-species flocks.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. A very little-known species. Apparently rare to uncommon, and patchily distributed. In mid-1980s, found to be locally quite numerous in its only known S Peruvian locality, in Madre de Dios. Probably merits conservation status of Near-threatened.
Bibliography. Balchin & Toyne (1998), Best *et al.* (1997), Butler (1979), Canaday (2002c), Cracraft (1985), Dick (1991), Meyer de Schauensee (1982), Parker (1997), Pearman (1994a), Prum (2001), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg (2002), Schulenberg & Servat (2001), Schulenberg *et al.* (2001), Stotz *et al.* (1996).

31. **Olivaceous Piha**

Snowornis cryptolophus

French: Cotinga olivâtre **German**: Gelbbauchpiha **Spanish**: Guardabosques Oliváceo
Other common names: Olivaceous Cotinga

Taxonomy. *Lathria cryptolopha* P. L. Sclater and Salvin, 1877, Monji, Ecuador.
Closely related to *S. subalaris*; both formerly placed in genus *Lipaugus*, but morphological study and recent analysis of DNA sequences indicate only remote relationship to that genus; previously suggested placement in genus *Lathria*, but that name unavailable. Two subspecies recognized.
Subspecies and Distribution.
S. c. mindoensis (Hellmayr & Seilern, 1914) - W Andes of Colombia (S from Antioquia) and NW Ecuador (Pichincha).
S. c. cryptolophus (P. L. Sclater & Salvin, 1877) - E Andes of Colombia (S from head of Magdalena Valley) and Ecuador, and E & C Andean slopes of Peru (S to Huánuco).



Descriptive notes. 23·5-25 cm; two males 83 g and 85 g. Has semi-concealed black feathers on crown; otherwise olive-green above, greyer on wings; underparts olive-green, paler on chin and yellower on belly, sometimes a few pale shaft streaks on throat and breast; underwing-coverts dull yellowish; iris dark brown, pale orbital ring; bill dark horn, paler base of lower mandible; legs grey. Differs from *S. subalaris* in relatively longer legs, narrower bill, greener tail, more green below, duller underwing. Sexes alike. Juvenile undescribed. Race *mindoensis* is slightly smaller than nominate, has concealed bases of black crown feathers extensively creamy white (instead of brown). Voice. No information.
Habitat. Montane forest at 570-2300 m; 1000-1800 m in Ecuador.
Food and Feeding. Fruits and insects, taken in short flight sally. Occasionally accompanies mixed-species foraging flocks.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Generally scarce to uncommon, and apparently local. Widespread destruction of forest at subtropical levels has certainly led to fragmentation and reduction of population of W race *mindoensis*. Occurs in La Planada Nature Reserve and Río Ñambí Natural Reserve, in Colombia.
Bibliography. Allen (1998), Best *et al.* (1997), Butler (1979), Hilty & Brown (1986), Mee *et al.* (2002), Meyer de Schauensee (1945, 1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg (2002), Schulenberg *et al.* (2001), Stotz *et al.* (1996), Traylor (1958), Zimmer (1930, 1936a).

Genus *LIPAUGUS* Boie, 1828

32. **Dusky Piha**

Lipaugus fuscocinereus

French: Piauhau sombre **German**: Andengraupiha **Spanish**: Guardabosques Oscuro

Taxonomy. *Querula fusco-cinerea* Lafresnaye, 1843, "Bogotá".
Probably closest to *L. weberi* and *L. uropygialis*. Monotypic.
Distribution. E, C & N end of W Andes of Colombia, and E slope in Ecuador and extreme N Peru (Cerro Chinguela).



Descriptive notes. 33 cm; 120-138 g. Largest member of genus, with rather long tail. Male is grey, duskier on wings and tail; has primaries 5-7 modified, with barbs of middle part of outer webs elongated, stiffened and not interlocking; paler grey below, with brownish wash from breast downwards; iris dark brown; bill dark brown or blackish, paler base of lower mandible; legs grey. Female is like male, but lacks modification of primaries. Immature has rufous-tipped wing coverts, presumably retained from juvenile plumage. Voice. Loud "pee-a-weeee" or "pee-a-weeee-a-weeee", last syllable slurring down scale. Loud wing noise made in display.
Habitat. Montane forest and adjacent second growth; mostly 2000-3000 m.
Food and Feeding. Feeds on fruit, which is taken in brief flight sally; probably also eats insects. In E Andes of Colombia, fruits of eight plant families recorded in diet, Chloranthaceae (*Hedyosmum*) numerically most important. Often in small groups; regularly accompanies mixed-species foraging flocks.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Uncommon to scarce, and patchily distributed. Numbers have certainly been reduced by extensive deforestation of Andes at subtropical and temperate levels.
Bibliography. Best *et al.* (1997), Butler (1979), Chapman (1917c), Cracraft (1985), Fjeldså & Krabbe (1990), Hilty & Brown (1986), López (2000), Meyer de Schauensee (1982), Parker, Parker & Plenge (1982), Parker, Schulenberg *et al.* (1985), Renjifo (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996).

33. **Chestnut-capped Piha**

Lipaugus weberi

French: Piauhau de Weber **Spanish**: Guardabosques Antioqueño
German: Braunkappen-Graupiha

Taxonomy. *Lipaugus weberi* Cuervo *et al.*, 2001, La Forzosa, Antioquia, Colombia.
Probably most closely related to *L. fuscocinereus*. Monotypic.
Distribution. N & NE slopes of Cordillera Central of Colombia (E of Nechí Valley, in Antioquia).



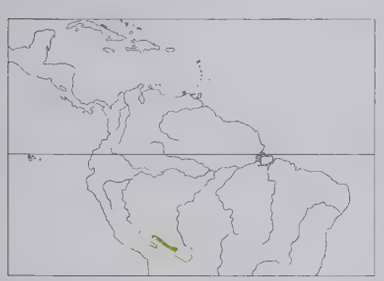
Descriptive notes. 24-25 cm; 72 g. Male has chestnut crown; plumage otherwise slate-grey, slightly paler below, with pale cinnamon undertail-coverts; primaries 6 and 7 modified, with barbs of outer webs stiffened and not interlocking; iris dark brown, orbital ring yellowish; bill blackish; legs grey. Female is like male, but primaries not modified. Juvenile is similar to adult, but with secondaries and outer primaries broadly fringed rufous. VOICE. Loud piercing "sreeck", rising in pitch and then abruptly descending, typically repeated at 1-second intervals; also, relatively quiet, nasal "gluck-gluck", apparently as contact or alarm.
Habitat. Primary premontane wet forest, including moderately disturbed forest; large cloudforests favoured; apparently absent from young secondary forest. Recorded at 1400-1900 m.
Food and Feeding. Mainly fruits, also occasionally large invertebrates. Fruits of several plant families recorded, including especially Lauraceae, also Rubiaceae, Myrsinaceae and Melastomataceae. Food items usually taken in short flight sallies; sometimes detaches fruits by making a twisting aerial "pirouette", occasionally plucks them while perched. Occasionally accompanies mixed-species foraging flocks.
Breeding. Season probably in first half of year; recently fledged young in early Jun, and male with almost completed moult and female in full wing and tail moult both in late Aug. Possible lek observed in Jul, three birds together, two of which chasing one another. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Conservation status not formally assessed, as this species was not discovered until as recently as 1999 and officially described in 2001. Appeared then to be fairly common within a narrow belt of very humid premontane forest in C range of Colombian Andes, where it had been recorded at five localities; estimated extent of range less than 100 km^2, and total population estimated at fewer than 2500 individuals; detected at a further 20 sites in the area in 2002. Intensive observations revealed that, in small forest fragments, this newly discovered cotingid exhibited high degree of morphological asymmetry (apparently related to lower survival rate, reduced fitness and poorer aerodynamics), indicating that it is one of the species most adversely affected by forest fragmention. In view of current rate of forest clearance and degradation within its very small range, recommendation has been made that this species be accorded conservation status of Endangered, or even Critical. An important 320-ha forest block at La Forzosa (type locality), which harbours populations of several other globally threatened bird species, is now formally protected. More complete investigation of this piha's present range desirable, and establishment of additional protected areas in this ornithologically poorly known region an urgent priority.
Bibliography. Anon. (2001b, 2001c), Cuervo & Renjifo (2002), Cuervo *et al.* (2001), Lowen (2002a, 2003), Stotz *et al.* (1996).

34. Scimitar-winged Piha

Lipaugus uropygialis

French: Piauhau à faucilles **German**: Rotbürzelpiha **Spanish**: Guardabosques Alicurvo
Other common names: Scimitar-winged Cotinga

Taxonomy. *Lathria uropygialis* P. L. Sclater and Salvin, 1876, Tilotilo, 8000 feet [c. 2440 m], La Paz, Bolivia.
Previously placed in a monotypic genus, *Chirocylla*, on basis of extreme modification of wing feathers; in other respects, however, similar to *L. fuscocinereus*, and probably closest to that species. Monotypic.
Distribution. E slope of Andes in extreme SE Peru (E Puno) and Bolivia (La Paz, Cochabamba).



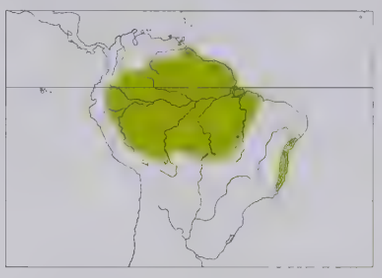
Descriptive notes. 30 cm; one male 116 g, one female 135 g. Male is grey above, paler grey below, with rufous-chestnut rump, lower flanks and undertail-coverts; primaries highly modified, strongly recurved and attenuated, also of unusual relative lengths, P5-P8 each progressively shorter than preceding one, P9 and P10 much longer; iris dark red-brown; bill blackish, dark horn below; legs plumbeous. Female is like male, possibly slightly larger, with primaries much less modified. Juvenile undescribed. VOICE. Uncertain; excited "wheeo, wheeo, whee-wheé, whee-wheé, whee-wheé", with variants, believed made by individual of this species (calling bird not seen).
Habitat. Montane forest and forest borders; 1800-2750 m.
Food and Feeding. Berries and fruits; probably also insects, but information lacking. Has been recorded with mixed-species flocks.
Breeding. No information. Two males in wing moult (presumably post-breeding), one in late stage at end Jul, other in very early stage in late Nov.
Movements. None recorded.
Status and Conservation. VULNERABLE. Restricted-range species: present in Bolivian and Peruvian Upper Yungas EBA. Rare, and very seldom seen; has small total range, within which has been found at only very few localities. Has apparently undergone severe population decline in areas of disturbed forest, and clearance and fragmentation of habitat continue to be a major threat; nevertheless, it exists in some large expanses, still little explored. Suggestion that it requires old-growth forest during at least part of the year would, if correct, render it more susceptible than other yungas species to effects of selective and small-scale logging. Recorded in Cotapata and Carrasco National Parks, in Bolivia.
Bibliography. Fjeldså & Krabbe (1990), Hennessey & Gómez (2003), Hennessey, Herzog & Sagot (2003), Meyer de Schauensee (1982), Remsen & Traylor (1989), Remsen *et al.* (1982), Ridgely & Tudor (1994), Snow (1982), Stattersfield & Capper (2000), Stotz *et al.* (1996).

35. Screaming Piha

Lipaugus vociferans

French: Piauhau hurleur **German**: Tiefland-Graupiha **Spanish**: Guardabosques Gritón
Other common names: Greenheart Bird

Taxonomy. *Muscicapa vociferans* Wied, 1820, Fazenda Pindoba, north of Caravellos, Bahia, Brazil.
Analysis of feather proteins has suggested possible relationship between this species and genus *Tijuca* (especially *T. atra*). Despite increase in size and weight from N to SW of range, and presence of isolated population in E Brazil, variation considered insufficient to merit naming of geographical races. Monotypic.
Distribution. E & S Venezuela (SE Sucre, Delta Amacuro, Bolívar, Amazonas), the Guianas, and forested parts of whole of Amazon Basin (W from edge of Andes) from Ecuador, Colombia and Brazil S to Bolivia; also coastal E Brazil (Pernambuco S to Espírito Santo).



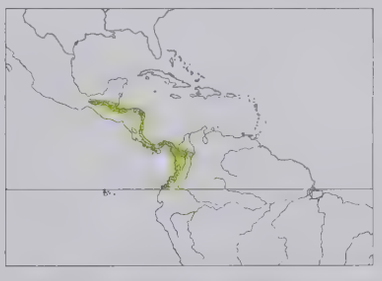
Descriptive notes. 24-28 cm; male average 67·2 g and female 70·6 g (Surinam), male average 81·9 g and female 82·6 g (Peru). Dullest and most uniform-coloured cotingid, but vocally outstanding. Plumage is grey overall, duskier on wings and tail, slightly paler below, especially on throat and belly; iris brown or brown-grey; bill dark brown or blackish, paler base of lower mandible; legs dark grey to greenish-grey. Sexes alike. Juvenile has rufous upperwing-coverts and rufous-tipped flight-feathers; plumage retained until first complete moult, when fully adult plumage acquired. VOICE. Extremely loud, ringing "pi pi y-o", audible through 300-400 m of forest, preceded by low-pitched, much less loud "groo, groo" (air inhaled); also loud, whistling "wee-oo".
Habitat. Humid forest, including seasonally flooded forest (*várzea*); also including *campinarana*, *terra firme* and *igapó* forest on sandy soil along Amazon. Mainly below 500 m, but to 1000 m in Andean foothills and 1400 m in Venezuela. Occurs at lower altitudes than *L. lanioides* where ranges overlap (SE Brazil).
Food and Feeding. Fruit and insects; single record of *Anolis* lizard, beaten against perch and swallowed at third attempt. Temporary tendency to concentrate on one or other food source indicated by records of stomach contents consisting mostly either of fruit or of insects, not both. Items usually taken in flight sally. Occasionally accompanies mixed-species foraging flocks.
Breeding. Nest found in Sept in Brazil (near Manaus); on evidence of moult, season evidently varies from N to S of range, with extensive C area where seasonality poorly marked. Male displays at lek, maintains small territory c. 5-8 m up in tree, separated from nearest neighbour by c. 40-60 m; attracts females by loud calling while jerking head backwards; usually up to 25 males, sometimes many more, at single lek. One nest documented, very small stick structure, entirely concealed by sitting bird, 7 m above ground on side branch of small tree, supported by branch and side twig. Clutch size and incubation and fledging periods not known.
Movements. None recorded.
Status and Conservation. Not globally threatened. Locally common to uncommon, and very widespread. Tolerant of variety of forest types, including quite small patches. Occurs in numerous protected areas throughout range. Isolated population in E Brazil presumably the only one at any possible risk, as forest in that region widely destroyed and remaining habitat at greatest threat; nevertheless, this species appears not uncommon there, and it occurs in Monte Pascoal National Park and Sooretama Biological Reserve; present also near Murici (Alagoas), where humid Atlantic Forest only partially protected.
Bibliography. Bates & Parker (1998), Best *et al.* (1997), Blake (1962), Brooks *et al.* (1999), Butler (1979), Canaday & Jost (1997), Cohn-Haft *et al.* (1997), Érard (1982), Haffer (1967), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Hinojosa *et al.* (1998), Mee *et al.* (2002), Meyer de Schauensee (1982), Oniki & Willis (1982), Oren & Parker (1997), Pinto (1940), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Schubart *et al.* (1965), Sick (1993, 1997), Snow, B.K. (1961), Snow, D.W. (1982), Snyder (1966), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tobias *et al.* (1993), Tostain *et al.* (1992), Whittaker (1996a), Willard *et al.* (1991), Zimmer & Hilty (1997).

36. Rufous Piha

Lipaugus unirufus

French: Piauhau roux **German**: Zimtrote Piha **Spanish**: Guardabosques Rojizo

Taxonomy. *Lipaugus unirufus* P. L. Sclater, 1860, Playa Vicente, Oaxaca, Mexico.
Geographical variation in colour over most of extensive range generally slight, considered not to merit taxonomic recognition; described race *clara* (Panama) synonymized with nominate. Two subspecies recognized.
Subspecies and Distribution.
L. u. unirufus P. L. Sclater, 1860 - S Mexico (E from N Oaxaca) E to N Honduras and E Nicaragua, and S to Panama and W Colombia (E to middle Magdalena Valley).
L. u. castaneotinctus (Hartert, 1902) - extreme SW Colombia and NW Ecuador (Esmeraldas).



Descriptive notes. 23-24 cm; 69-87 g, mean 82·1 g. Plumage is cinnamon-brown overall, slightly brighter on crown, wings and tail, somewhat paler below, especially on throat; iris brown; bill dark brown or blackish, base flesh-coloured; legs dark grey to olive. Sexes alike. Immature plumage is similar to that of adult. Race *castaneotinctus* is darker, more chestnut-tinged, than nominate. VOICE. Utters a single loud, shrill and far-carrying "peer"; also makes two softer, less insistent calls, "cheer-weet", which is occasionally three-noted "whee-er-wit", and a short loud trill or a longer, very musical trill.
Habitat. Humid forest and mature secondary growth, occasionally adjacent more open areas; up to 1200 m.
Food and Feeding. Fruits, and invertebrates. Fruits include, in particular, those of palms and Lauraceae. Invertebrates mainly insects, also spiders; a small scorpion (Scorpiones) also recorded. Items usually taken in flight sally at middle levels of forest, rarely also from ground.
Breeding. Laying in Mar-Aug in Costa Rica, probably up to two broods; on evidence of moulting dates, breeding season earlier in W Colombia and Ecuador. Nest (Central America) an extremely small and slight saucer of coiled tendrils (egg easily visible from below), sited 5-11 m above ground,

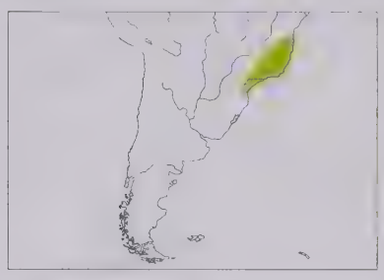
usually supported between two or more thin horizontal twigs well out from trunk on side branch of small tree. Clutch 1 egg; incubation period c. 25-26 days; fledging period 28-29 days.
Movements. None recorded.
Status and Conservation. Not globally threatened. Reasonably common throughout much of its range. Occurs in Alexander Skutch Private Reserve, in Costa Rica, and Darién National Park, in Panama. Uncommon to locally common in S, where extensive destruction of lowland forest in SW Colombia and NW Ecuador may eventually threaten survival of race *castaneotinctus*; range has apparently contracted in Ecuador, where formerly extended S to S Pichincha.
Bibliography. Beletsky (1998, 1999), Best *et al.* (1997), Binford (1989), Brodkorb (1943), Butler (1979), Chapman (1917c), Cooper (1997), Cracraft (1985), Eisenmann (1955), González-García (1993), Griscom (1950), Haffer (1967, 1975), Hilty & Brown (1986), Howell & Webb (1995a), Jahn & Mena (2002b), Land (1970), Meyer de Schauensee (1982), Moermond & Denslow (1985), Monroe (1968), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), Selvin & Castillo (2000), Skutch (1969, 1999), Slud (1960, 1964), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996).

37. Cinnamon-vented Piha

Lipaugus lanioides

French: Piauhau à tête grise **German**: Graubraune Piha **Spanish**: Guardabosques Lanioide

Taxonomy. *Turdampelis lanioides* Lesson, 1844, Rio de Janeiro, Brazil.
Monotypic.
Distribution. SE Brazil, from SE Bahia, C Minas Gerais and Espírito Santo S to NE Santa Catarina.



Descriptive notes. 27-28 cm; 85-110 g. Plumage is mostly grey, crown weakly scaled, upperparts with brownish wash, brownest on wings and tail; primaries slightly, but uniquely, modified, P9 (next to outermost) distinctly long, projecting beyond otherwise curved outline of spread wing; underparts mostly pale greyish-brown with small whitish shaft streaks, cinnamon-buff undertail-coverts; iris dark brown; bill dark brown or blackish, paler base of lower mandible, inside of gape pink-yellow; legs grey. Sexes alike. Juvenile undescribed. VOICE. Generally silent; loud whistle of several notes, a typical sequence "skeeo-skeeo, skeeo-skeeo, skeeo-sheét", given at long intervals.
Habitat. Humid forest in mountainous country, from foothills to 1400 m, mainly 500-1000 m. Occurs at higher altitudes than *L. vociferans* where ranges overlap. Occasionally recorded at much lower levels in S of range.
Food and Feeding. Mainly fruits, also large insects. In observations at Intervales (São Paulo), diet estimated to be c. 86% fruits and 14% insects; fruits comprised those of 38 plant species (of 20 families), mainly *Euterpe* palms, with average width 8·3 mm (range 2·2-23 mm). Nestling fed entirely with insects for first 12-14 days, then up to 30% fruit per day. Foraging adult peers about slowly, sidling or sallying for fruits or insects on foliage or branches.
Breeding. Laying recorded in Dec-Feb; nesting season probably Sept-Mar. Nest (three found) an extremely small, thin platform of twigs, placed 7-8 m above ground on horizontal twig and side twig of small tree. Clutch 1 egg; incubation period 26 days; fledging period 25-26 days.
Movements. Possibly some altitudinal movements in S of range, where recorded near sea-level.
Status and Conservation. VULNERABLE. Rare; population small and fragmented. In extreme S of range, recent records from only one site in each of E Paraná and Santa Catarina. Most numerous in Augusto Ruschi Biological Reserve (Espírito Santo), where population estimated at a few hundreds, and reasonably common in same state at Pindobas IV; also common in Intervales State Park (São Paulo); occurs also in Monte Pascoal and Serra dos Órgãos National Parks and Serra do Brigadeiro and Rio Doce State Parks. Numbers undoubtedly greatly reduced by widespread destruction of E Brazilian coastal forests, and further threatened by human exploitation of *Euterpe* palms, a Brazilian delicacy.
Bibliography. Aleixo & Galetti (1997), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga, Jones & Scott (1987), Collar, Gonzaga, Krabbe *et al.* (1992), Cracraft (1985), Forrester (1993), Gonzaga *et al.* (1995), Guix (1995), Guix *et al.* (1992), Meyer de Schauensee (1982), Ridgely & Tudor (1994), do Rosário (1996), Schubart *et al.* (1965), Scott & Brooke (1985), Sick (1993, 1997), Simon *et al.* (1999), Souza (1999), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Willis & Oniki (1998).

38. Rose-collared Piha

Lipaugus streptophorus

French: Piauhau à collier **German**: Halsbandpiha **Spanish**: Guardabosques Acollarado

Taxonomy. *Lathria streptophora* Salvin and Godman, 1884, Roraima, Venezuela.
Monotypic.
Distribution. Tepuis of SE Venezuela and adjacent N Brazil and Guyana.



Descriptive notes. 22·5 cm. Distinctive piha; striking sexually dimorphic plumage unique within genus. Male is grey above, paler below, especially on belly; has full collar and undertail-coverts pinkish-magenta; iris dark brown; bill dark brown or blackish, paler base of lower mandible; legs grey. Female is slightly smaller than male, lacks pink collar, has undertail-coverts cinnamon-rufous. Juvenile undescribed. VOICE. Main call a clear, whistled "sueeet-suéééeeeeoo", rising and then falling, often given in incomplete form; another call described as loud and very sharp "skreeyr", given at long intervals, perhaps same as call described as a screeching trill (uttered repetitively by displaying male). Explosive "pow, pow" made by displaying male perhaps mechanical wing noise.
Habitat. Montane forest, regularly forest edge; 1000-1800 m.
Food and Feeding. Mainly fruits, especially of Melastomataceae, taken in flight sally or flutter; also insects.
Breeding. Female collecting nest material in Apr; moult (presumably post-breeding) begins over extended period, Dec-May. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tepuis EBA. Status not well known; apparently uncommon, possibly local, but may be more numerous in some places. Occurs in Canaíma National Park, in Venezuela. Despite small range, is not thought to be at any risk; much intact forest remains on slopes of table mountains, which are difficult of access for humans.
Bibliography. Barnett *et al.* (2002), Chapman (1931), Cracraft (1985), Forrester (1993), Hilty (2003), Mayr & Phelps (1967), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Rodner *et al.* (2000), Sick (1993, 1997), Snow (1982), Snyder (1966), Stotz *et al.* (1996).

Genus *TIJUCA* Férussac, 1829

39. Black-and-gold Cotinga

Tijuca atra

French: Cotinga noir **German**: Goldflügelkotinga **Spanish**: Cotinga Negro

Taxonomy. *Tijuca atra* Férussac, 1829, Serra do Mar, Rio de Janeiro, Brazil.
Validity of genus uncertain; possibly better merged with structurally similar *Lipaugus*, as analysis of feather proteins suggested close relationship with *L. vociferans*; further study required. Monotypic.
Distribution. SE Brazil, in extreme E São Paulo, extreme S Minas Gerais and Rio de Janeiro.



Descriptive notes. 26·5-27·5 cm. General proportions like those of a thrush (Turdidae), with rather short wings rounded at tip; slightly hooked bill notched near tip, rictal bristles weakly developed. Male is black, with large golden-yellow patch on flight-feathers; iris reddish-brown; bill bright orange; legs dark brown. Female is dull olive-green, yellower on flight-feather edges and belly, bill duller and browner. Immature plumage is like female; in male, this replaced by subadult plumage in which variable number of contour feathers (especially on belly) of immature type, followed by full adult plumage. VOICE. Male call an extremely pure whistle, with short break, followed by slightly higher-pitched ending, the whole lasting c. 3 seconds, interval between calls c. 2 seconds; two or more males regularly call together from treetops, alternating calls so as to produce continuous whistling audible for considerable distance.
Habitat. Montane forest; mainly 1200-2050 m.
Food and Feeding. Mainly fruit, also insects. Few identified records, but fruits of Lauraceae apparently important, and those of *Rapanea* (Myrsinaceae) also taken. Fruits usually taken from perched position, occasionally plucked in fluttering flight; insects mostly seized from foliage in short aerial sally.
Breeding. Old record of nest found in Nov, without details; available data indicate that females begin to moult in Dec, suggesting possible breeding in Sept-Nov, similar to that of other species in same area. No other information.
Movements. Some wandering to lower altitudes in off-season indicated by Jul record in Serra do Itatiaia at c. 1150 m, c. 600 m below usual level in that area.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Atlantic Forest Mountains EBA. Locally common. Numerous in upper parts of Itatiaia and Serra dos Orgãos National Parks, and reasonably common elsewhere in suitable habitat. Although confined to very small range, montane forest in area in which it occurs has suffered comparatively little compared with adjacent lowland forest. Habitat is little disturbed, and much of it steep and difficult of access. Sometimes hunted for food.
Bibliography. Cracraft (1985), Descourtilz (1983), Forrester (1993), Hellmayr (1929), Meyer de Schauensee (1982), Parker *et al.* (1996), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Snow & Goodwin (1974), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Wilkinson (1996).

40. Grey-winged Cotinga

Tijuca condita

French: Cotinga à ailes grises **German**: Grauflügelkotinga **Spanish**: Cotinga Aligrís
Other common names: Orgaos/Snow's Cotinga

Taxonomy. *Tijuca condita* Snow, 1980, Serra dos Órgãos, Rio de Janeiro, Brazil.
Validity of genus uncertain; possibly better merged with the structurally similar *Lipaugus*, as an analysis of feather proteins suggested close relationship with *L. vociferans*; further study required. Monotypic.
Distribution. Serra dos Órgãos and Serra do Tinguá, c. 40-50 km NE of Rio de Janeiro, Brazil.



Descriptive notes. 24 cm. Male has dull greyish face and upper throat; olive-green above, yellower on rump, darker and browner wings and tail, outer webs of remiges silvery grey; olive-yellow below, yellower belly and underwing-coverts; iris brown; upper mandible dark grey, lower mandible yellow-olive; legs dark horn. Distinguished from similar *T. atra* female mainly by smaller size, brighter plumage coloration, silvery colour on flight-feathers. Female is smaller than male, plumage duller; very like female *T. atra* but much smaller, with smaller, more delicate bill, markedly more delicate legs and feet, also stronger

suffusion of yellow in body plumage, especially on rump, and greyer wings. Juvenile undescribed.
Voice. Male call a loud disyllabic whistle, emphasis on second syllable, "sooee-wheee", c. 1·25 seconds long; at distance only second syllable audible.
Habitat. Very humid elfin cloudforest with many bromeliads; mainly 1370-1980 m, probably at least occasionally descends lower.
Food and Feeding. Recorded as feeding on berries, including small melastomes (Melastomataceae). No further information.
Breeding. Female mist-netted in mid-Nov had well-developed brood patch. No other information available.
Movements. Probably wanders at least occasionally to levels well below high-altitude elfin forest; unique specimen, from near Teresópolis (lower slopes of Serra dos Órgãos) in Oct, almost certainly below 1370 m but altitude not recorded.

Status and Conservation. VULNERABLE. Restricted-range species: present in Atlantic Forest Mountains EBA. Original and only specimen, a female collected in 1942, originally identified as *T. atra*; not recognized as separate species until almost 40 years later. Has tiny range and presumed small population; few observations, and seems to exist in very low densities. Known to occur in only two mountain ranges: almost all records from Serra dos Órgãos, but recorded also in Serra do Tinguá. Occurs in both Serra dos Órgãos National Park and Tinguá Biological Reserve. High-altitude elfin-forest habitat not under any immediate threat, but disturbance caused by walkers, as well as fires, pose potential risks. Any significant deterioration in or loss of habitat would require upgrading of species' conservation status to that of Endangered.
Bibliography. Collar & Andrew (1988), Collar *et al.* (1992), Cracraft (1985), Forrester (1993), Ridgely & Tudor (1994), Scott & Brooke (1985), Sick (1993, 1997), Snow (1980), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993).



PLATE 5

inches 4

cm 10

Genus *PORPHYROLAEMA* Bonaparte, 1854

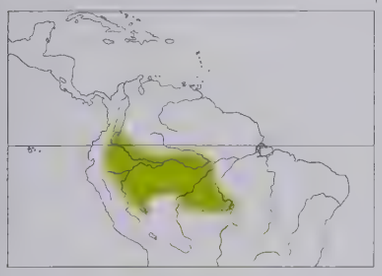
41. **Purple-throated Cotinga**

Porphyrolaema porphyrolaema

French: Cotinga à gorge mauve **German**: Purpurkehlkotinga **Spanish**: Cotinga Gorgimorado

Taxonomy. *Cotinga porphyrolaema* Deville and P. L. Sclater, 1852, Sarayacu, River Ucayali, Peru. Monotypic.

Distribution. S Colombia, E Ecuador, E Peru (S to Madre de Dios) and W Amazonian Brazil (E to lower R Negro and N Mato Grosso).



Descriptive notes. 18-18·5 cm; mean 60 g. Distinctive; wide bill with strongly arched culmen, rictal bristles weakly developed. Male is black above, including wings and tail, has white fringes on back to uppertail-coverts and on upperwing-coverts, conspicuous white band along inner wing-coverts and edges of tertials; deep purple on throat; white below, some black barring on rear flanks; iris dark brown; bill blackish; legs blackish. Female is very different, dark brown with pale buff margins above, cinnamon-buff with black barring below, deeper and more plain rufous on throat; also body feathers of looser texture than those of adult male, and tail feathers longer and more pointed at tip. Juvenile is like female, but paler and buffier; immature unrecorded. Voice. High, plaintive "preeeeeer", 1-2 seconds long, regularly repeated from treetop perch.

Habitat. Humid forest to 900 m, mostly to c. 400 m.

Food and Feeding. Mainly fruits of forest trees, including *Cecropia*. Only two records of feeding behaviour, both of birds perched and leaning down to pluck fruit. Often in pairs.

Breeding. No information. Dates of moult (presumed post-breeding) suggest breeding at almost all times of year.

Movements. None recorded.

Status and Conservation. Not globally threatened. Not well known. Apparently uncommon or rare, but widespread; as other birds that stay mainly in canopy, is almost certainly under-recorded in areas of unbroken forest. Occurs in several protected areas, e.g. Amacayacu National Park, in Colombia, Cuyabeno Reserve, in Ecuador, Rio Cristalino Forest Reserve, in Brazil, and Manu National Park and Biosphere Reserve, in Peru.

Bibliography. Best *et al.* (1997), Brooks *et al.* (1999), Butler (1979), Cracraft (1985), Gyldenstolpe (1950), Hellmayr (1929), Hilty & Brown (1986), Meyer de Schauensee (1982), Negret (2001), Parker, Donahue & Schulenberg (1994), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson (1997), Sick (1993, 1997), Stotz *et al.* (1996), Terborgh *et al.* (1984), Whittaker (1996a, 1996b), Zimmer *et al.* (1997).

Genus *COTINGA* Brisson, 1760

42. **Lovely Cotinga**

Cotinga amabilis

French: Cotinga céleste **German**: Azurkotinga **Spanish**: Cotinga Azulejo

Taxonomy. *Cotinga amabilis* Gould, 1857, Verapaz, Guatemala.

May form a superspecies with *C. ridgwayi*, *C. nattererii*, *C. maynana*, *C. cotinga* and *C. maculata*, and all sometimes treated as conspecific. Monotypic.

Distribution. SE Mexico (from S Veracruz and N Oaxaca) E to N Honduras and E Nicaragua and S to E Costa Rica.



Descriptive notes. 18-19 cm; 66-75 g. Male is mostly deep turquoise-blue, feathers with concealed black bases; wings black with very narrow blue edges, edges broader on tertials and greater wing-coverts; median and lesser coverts similar to back; primary P7 short, P8 and P9 with outer webs sinuated; tail (almost concealed by long uppertail-coverts) black; large purple patch on throat, larger one on breast and upper belly; iris dark brown; upper mandible blackish with grey base, lower mandible grey; legs dark grey. Differs from *C. ridgwayi* mainly in larger size, longer uppertail-coverts, from *C. nattererii* in less dark throat patch and absence of black eyering, from both in structure of primaries. Female is very different, dark brown with buff-white fringes above, wings and tail dusky brown, median and lesser coverts patterned like back, edges of greater coverts and tertials more cinnamon; underparts whitish with brown spotting, undertail-coverts plain. Immature is like adult female, flight-feathers with buff tips (tend to wear off); adult male plumage acquired when just over a year old (except that purple of throat tends at first to be paler). Voice. Generally silent; screaming calls by female when mobbing nest predator, and clear monosyllabic "ic, ic, ic" when alarmed by human searching for fallen chick. Flying male makes light rattling wing noise.

Habitat. Canopy of humid evergreen forest; also more open areas with scattered trees. To 1700 m.

Food and Feeding. Fruits, especially of Lauraceae, plucked in fluttering sallies; also insects and small lizards.

Breeding. Nest found in mid-May in Costa Rica, probably cup-shaped, c. 31 m up in treetop, hidden in epiphytes, contained at least 1 nestling. No other information.

Movements. None recorded. Single record from W Panama (Bocas del Toro) in 1978 possibly involved wandering individual from adjacent Costa Rica.

Status and Conservation. Not globally threatened. Rare and local in most of range; possibly uncommon in some N parts. Population much reduced by extensive deforestation throughout its range.

Bibliography. Angehr (2003), Bangs (1903), Beletsky (1999), Binford (1989), Blake, E.R. (1953), Cooper (1997), Dearborn (1907), Eisenmann (1955), Fogden (1993), González-García (1993), Haffer (1967), Hellmayr (1929), Howell & Webb (1995a), Land (1970), Lee Jones (2004), Levey & Stiles (1994), Monroe (1968), Parker (1993a), Ridgely & Gwynne (1989), Ridgway (1907), Selvin & Castillo (2000), Skutch (1969), Slud (1964), Stiles (1983, 1985), Stiles & Skutch (1989), Stotz *et al.* (1996).

43. **Turquoise Cotinga**

Cotinga ridgwayi

French: Cotinga turquoise **German**: Ridgwaykotinga **Spanish**: Cotinga Turquesa
Other common names: Ridgway's Cotinga

Taxonomy. *Cotinga ridgwayi* Ridgway, 1887, Pozo Azul, Costa Rica.

May form a superspecies with *C. amabilis*, *C. nattererii*, *C. maynana*, *C. cotinga* and *C. maculata*, and all sometimes treated as conspecific. Monotypic.

Distribution. Pacific slope of Costa Rica (S from Gulf of Nicoya) and W Panama (S to Chiriquí).



Descriptive notes. 17-18·5 cm; male 51·5-54 g, female 63·2-65·7 g. Male is mostly deep turquoise-blue, feathers with concealed black bases; wings black with very narrow blue edges, edges broader on tertials and greater wing-coverts; median and lesser coverts similar to back; primaries P9 and P10 thin and short, P9 especially so, somewhat incurved at tip, and P8 and P9 with outer webs sinuated near base; tail (partly concealed by long uppertail-coverts) black; large purple patch on throat, larger one on breast and upper belly; iris dark brown; upper mandible black with greyish base, lower mandible grey with blacker tip; legs dark grey or blackish. Differs from *C. amabilis* in somewhat smaller size, shorter uppertail-coverts (no more than two-thirds length of tail), from *C. nattererii* in bill proportions, absence of black eyering, less blackish throat patch, from both in structure of primaries. Female is markedly larger than male, dark brown with buffish-white fringes above, wings and tail dusky brown, median and lesser wing-coverts like back, edges of greater coverts and tertials more cinnamon; underparts pale buff with greyish-brown spotting, undertail coverts plain buff. Immature is like adult female, flight-feathers with buff tips (tend to wear off); male much as adult when just over a year old. Voice. Generally silent; female distress call a raucous shriek. Flying male makes soft twittering wing noise.

Habitat. Canopy of humid forest and second-growth woodland; to 1850 m, in Panama generally below 900 m.

Food and Feeding. Only fruits recorded, of a wide variety, from tree fruits and parasitic mistletoes (Loranthaceae) to berries of low-growing poke-weed (*Phytolacca*).

Breeding. Single record from Costa Rica. Nest a slight, shallow cup of coiled tendrils and long fungal strands, sited 9 m up at fork of horizontal branch of isolated tree near forest edge; 2 eggs laid in Mar. No other information.

Movements. Evidently subject to irregular wandering, perhaps related to local availability of fruit.

Status and Conservation. VULNERABLE. Restricted-range species: present in South Central American Pacific Slope EBA. Generally rare and local, and has very small range. Recent records from only few sites in Costa Rica, i.e. Carara Biological Reserve, the Osa Peninsula (including Corcovado National Park), and the E foothills; in Panama, found recently only in Santa Clara area (W of Volcán) and at El Chorogo. Extensive destruction of forest has severely reduced its numbers and range in Panama, and remaining habitat in Costa Rica is inadequately protected.

Bibliography. Angehr (2003), Angehr & Jordan (1998), Collar & Andrew (1988), Collar *et al.* (1994), Delgado (1985), Eisenmann (1955), Haffer (1967), Hellmayr (1929), Moermond & Denslow (1985), Ridgely & Gwynne (1989), Ridgway (1907), Skutch (1969), Slud (1964), Snow (1982), Stattersfield & Capper (2000), Stiles (1983, 1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wege & Long (1995), Wetmore (1972).

44. **Blue Cotinga**

Cotinga nattererii

French: Cotinga bleu **German**: Nördliche Prachtkotinga **Spanish**: Cotinga Azul
Other common names: Natterer's Cotinga

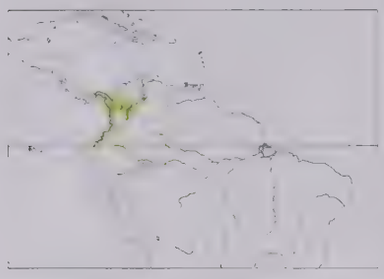
Taxonomy. *Ampelis Nattererii* Boissonneau, 1840, "Bogotá" [presumably from lower altitude in adjacent Magdalena Valley], Colombia.

May form a superspecies with *C. amabilis*, *C. ridgwayi*, *C. maynana*, *C. cotinga* and *C. maculata*, and all sometimes treated as conspecific. Monotypic.

Distribution. Panama (E from W Colón), Colombia (Pacific lowlands and E to middle Magdalena Valley), extreme W Venezuela (NW Táchira, Mérida) and NW Ecuador (Esmeraldas).

Descriptive notes. 18-20 cm. Male is mostly deep turquoise-blue, feathers with concealed black bases, black eyering; wings black, narrowly edged blue, edges broader on tertials and greater wing-coverts; median and lesser coverts similar to back; primary P9 with constricted inner web, P8 and P10 slightly so; tail (almost concealed by long uppertail-coverts) black; large purple-black patch on throat, larger and more purple one on breast and upper belly; iris dark brown; upper mandible black with greyish base, lower mandible grey with blacker tip; legs dark grey or blackish. Differs from *C. amabilis* and *C. ridgwayi* mainly in rather smaller bill, black eyering, blacker throat patch, structure of primaries; uppertail-covert length usually intermediate. Female is dark brown with

On following pages: 45. Plum-throated Cotinga (*Cotinga maynana*); 46. Purple-breasted Cotinga (*Cotinga cotinga*); 47. Banded Cotinga (*Cotinga maculata*); 48. Spangled Cotinga (*Cotinga cayana*).



pale scaling above, including on median and lesser wing-coverts, has greater coverts and secondaries edged cinnamon-buff; underparts cinnamon-buff with dusky brown centres, giving scaly appearance, undertail-coverts plain cinnamon-buff. Immature resembles female, flight-feathers with buff tips (tend to wear off); male like adult when just over a year old, except that often initially slightly paler. VOICE. No vocal sound by male; flying male makes whistling wing noise. Loud shrieks by female at nest.

Habitat. Canopy of humid forest and secondary woodland, mostly below 300 m, occasionally higher; to 1000 m, locally 1400 m, in Colombia.

Food and Feeding. Only fruit recorded, usually taken in brief fluttering sally. Sometimes forages in small groups of up to c. 10 individuals.

Breeding. Two records of laying in Feb in Panama. Nest, used in two successive years, 28 m above ground in sandbox tree (*Hura crepitans*), in angle formed by orchid growing from side of nearly horizontal branch; clutch presumed 2 eggs, as 2 nestlings observed. No other information.

Movements. None recorded.

Status and Conservation. Not globally threatened. Uncommon to rare throughout range. Numbers undoubtedly much reduced by extensive destruction of lowland forest, especially in Ecuador, where now very rare. Rare in Río Claro Reserve, in Colombia.

Bibliography. Best *et al.* (1997), Butler (1979), Chapman (1917c), Chapman (1929a), Cracraft (1985), Delgado (1985), Eisenmann (1955), Haffer (1967, 1975), Hellmayr (1929), Hilty (1997, 2003), Hilty & Brown (1986), Jahn & Mena (2002c), Meyer de Schauensee (1982), Moynihan (1960), Parker (1992c), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Stotz *et al.* (1996), Velásquez (1991), Wetmore (1972), Willis & Eisenmann (1979).

45. **Plum-throated Cotinga**

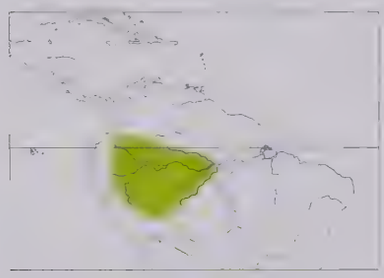
Cotinga maynana

French: Cotinga des Maynas **German**: Veilchenkehlkotinga **Spanish**: Cotinga Mayna

Taxonomy. [*Ampelis*] *Maynana* Linnaeus, 1766, Maynas, Peru.

May form a superspecies with *C. amabilis*, *C. ridgwayi*, *C. nattererii*, *C. cotinga* and *C. maculata*, and all sometimes treated as conspecific. Monotypic.

Distribution. C & W Amazon Basin in S Colombia, E Ecuador, E Peru, Brazil (E to lower R Negro and lower R Madeira) and N Bolivia.



Descriptive notes. 19·19·5 cm; mean 69 g. Male is turquoise-blue, some pink feather bases showing through; comparatively small deep purple patch on throat; flight-feathers and rectrices black with blue edges, closed wing appears mostly blue; primaries P7-P10 with inner webs sinuated, P8 very slender; iris yellow; bill dark grey or blackish; legs dark grey or blackish. Female is on average larger than male, has upperparts and wings greyish-brown, inconspicuously scaled buff, underparts paler greyish-brown, becoming ochraceous on belly and undertail-coverts, some feathers with darker centres giving mottled appearance, especially on breast; iris often duller and darker than male's. Immature is like female, flight-feathers with buff tips (tend to wear off); adult male plumage acquired when just over a year old, but throat colour often initially paler. VOICE. No vocal sound recorded. Male makes twittering wing noise in normal flight, much louder in display-flight.

Habitat. Canopy of humid forest, especially seasonally flooded forest (*várzea*); mostly below 700 m.

Food and Feeding. Only fruit recorded, usually taken in fluttering sally, sometimes while perched. The large, plum-like fruits of mistletoes of genus *Psittacanthus* much favoured, attracting birds from a distance. Often found together with *C. cayana*.

Breeding. No clear information on breeding season. Displaying male flies slightly downwards from high perch, then out over open space for c. 40 m, suddenly brakes with loud "whirr" wing noise, and returns to perch. Nothing else known.

Movements. None recorded.

Status and Conservation. Not globally threatened. Uncommon to locally fairly common; at least locally common in upper and central Amazonian forest region. In Ecuador, severe decline in numbers recorded at Jatun Sacha (W Napo); causes unknown. Occurs in several protected areas, e.g. Amacayacu National Park, in Colombia, and Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru.

Bibliography. Allen (1995), Angehr & Aucca (1997), Best *et al.* (1997), Brooks *et al.* (1999), Butler (1979), Cohn-Haft *et al.* (1997), Cracraft (1985), Dyck (1971), Haffer (1967), Hellmayr (1929), Hilty & Brown (1986), Meyer de Schauensee (1982), Ortiz & Carrión (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson (1997), Robinson & Terborgh (1997), Sick (1993, 1997), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Terborgh *et al.* (1984).

46. **Purple-breasted Cotinga**

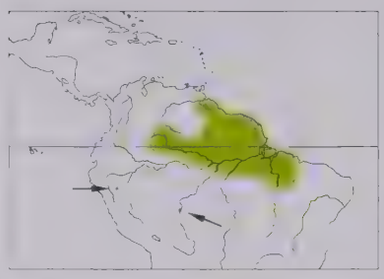
Cotinga cotinga

French: Cotinga de Daubenton **German**: Purpurlatzkotinga **Spanish**: Cotinga Pechimorado
Other common names: Blue Cotinga(!)

Taxonomy. [*Ampelis*] *Cotinga* Linnaeus, 1766, Belém, Pará, Brazil.

May form a superspecies with *C. amabilis*, *C. ridgwayi*, *C. nattererii*, *C. maynana* and *C. maculata*, and all sometimes treated as conspecific. Probably closest to last of those, which similar in plumage and in male's wingtip modification. Monotypic.

Distribution. Extreme E Colombia, S & E Venezuela, the Guianas, and N & E Amazonian Brazil (E to W Maranhão and S to extreme N Goiás; W limit uncertain); isolated records in NE Peru (San Martín) and W Brazil (Rondônia).



Descriptive notes. 18 cm; one male 53 g, one female 55 g. Bill comparatively short, curved on culmen. Male is glistening deep cobalt-blue above and on lowermost underparts, some black feather bases showing through; vinaceous purple from throat to belly; wings and tail black, blue margins on tips of median wing-coverts, lesser coverts more broadly edged blue; primary P7 short, P8 and P9 with outer webs sinuated, P9 and P10 thin and tapering at tip; iris very dark brown; bill grey, blackish at tip; legs grey. Female is smaller than male, dusky brown with conspicuous whitish scaling above, buff to whitish with contrasting dusky brown centres below, chin and undertail-coverts unspotted; very similar to female of *C. maculata*, but smaller and slightly less contrastingly scaled. Immature resembles female, flight-feathers with buff tips (tend to wear off); male acquires adult plumage when just over a year old, initially sometimes paler below. VOICE. Usually silent; rarely, a high, plaintive, repeated "preeeeeeer" heard. Flying male makes whistling wing noise.

Habitat. Canopy of humid forest; to 800 m.

Food and Feeding. Apparently only fruit. Stomachs of two specimens contained fruits of *Euterpe* palm.

Breeding. No clear information.

Movements. None recorded.

Status and Conservation. Not globally threatened. Locally uncommon to rather rare; possibly locally fairly common in the Guianas. Generally less common than sympatric and more widespread *C. cayana*. Occurs in Imataca Forest Reserve and El Dorado, in Venezuela.

Bibliography. Friedmann (1948), Gilliard (1941), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Kirwan & Hornbuckle (1997b), Meyer de Schauensee (1982), Oren & Parker (1997), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Whittaker (1996b), Williams (1995b).

47. **Banded Cotinga**

Cotinga maculata

French: Cotinga cordonbleu **German**: Südliche Prachtkotinga **Spanish**: Cotinga Maculado

Taxonomy. *Ampelis maculatus* Statius Muller, 1776, Rio de Janeiro, Brazil.

May form a superspecies with *C. amabilis*, *C. ridgwayi*, *C. nattererii*, *C. maynana* and *C. cotinga*, and all sometimes treated as conspecific. Probably closest to last of those, which similar in plumage and in male's wingtip modification. Monotypic.

Distribution. Littoral areas of E Brazil in SE Bahia and N Espírito Santo.



Descriptive notes. 20 cm; one male 65 g. Male is glistening cobalt-blue above and on lowermost underparts, some black feather bases showing through; vinaceous purple from throat to belly, separated by deep blue breastband; wings and tail black, median and lesser wing-coverts mostly blue; primary P7 short, P8-P10 attenuated at tip; iris dark brown; upper mandible black with greyish base, lower mandible grey with blacker tip; legs dark grey or blackish. Female is smaller than male, dusky brown with conspicuous whitish scaling above, pale greyish-buff with contrasting dusky brown centres below; very similiar to female of *C. cotinga*, but larger and slightly more contrastingly scaled. Immature is like female, flight-feathers with buff tips (tend to wear off); male acquires adult plumage when just over a year old. VOICE. No vocal sound recorded. Flying male makes sharp whirring wing noise.

Habitat. Canopy of humid forest, to limited extent also adjacent secondary woodland; below 200 m.

Food and Feeding. Little information. Fruit; old statement that diet includes caterpillars and other insects perhaps unreliable. Fruits of *Ficus*, *Ocotea* and *Rapanea* recorded as eaten.

Breeding. Single nest found (in Oct) suggests laying in Sept or Oct, and this is supported by specimen records indicating that moult (presumed post-breeding) begins Nov-Dec. Nest was a very slight structure of small twigs, placed in horizontal fork of branch in canopy of tall tree at forest border; attended by incubating female. Report of nest inside arboreal termitarium requires corroboration.

Movements. Apparently resident; in the past some local movement reported, but none recorded in recent times.

Status and Conservation. ENDANGERED. CITES I. Restricted-range species: present in Atlantic Forest Lowlands EBA. Rare, and long considered to be decreasing. Has very small range, covering c. 780 km², and global population estimated at fewer than 1000 individuals, almost all now confined to four nominally protected reserves. Formerly occurred in Minas Gerais (last recorded in 1940) and farther S, to Rio de Janeiro (no records since 19th century). Has undoubtedly suffered serious reduction in both numbers and range following extensive destruction of lowland Atlantic Forest. Survives in Bahia in Estação Vera Cruz (Porto Seguro) and Monte Pascoal National Park, both of which are far from secure; in Espírito Santo, somewhat more effectively protected in Sooretama Biological Reserve and Linhares Natural Reserve. Possibility that it may be present in Rio Doce State Park, in Minas Gerais, requires investigation. This species was once frequently collected for the cagebird market, by which it was much prized, but is now seen with far less frequency in trade, no doubt because it has become very much rarer.

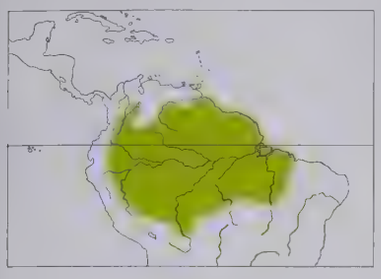
Bibliography. Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga, Jones & Scott (1987), Collar, Gonzaga, Krabbe *et al.* (1992), Cordeiro (2000), Cracraft (1985), Descourtilz (1983), Forrester (1993), Hellmayr (1929), King (1978/79), Meyer de Schauensee (1966, 1982), Ridgely & Tudor (1994), Rutgers & Norris (1977), Scott & Brooke (1985), Sick (1972, 1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993).

48. **Spangled Cotinga**

Cotinga cayana

French: Cotinga de Cayenne **German**: Türkisblaue Kotinga **Spanish**: Cotinga Celeste

Taxonomy. [*Ampelis*] *cayana* Linnaeus, 1766, Cayenne.
May be less closely related to others of genus than they are to one another. Monotypic.
Distribution. Colombia E of Andes, S & E Venezuela, the Guianas, and Amazon Basin in Ecuador, Peru, Brazil (E to Maranhão, S to Rondônia and N Goiás) and N Bolivia.



Descriptive notes. 20 cm; 56-72·5 g. Somewhat more contrastingly patterned than congeners. Male is a rather pale shining turquoise-blue, black of bases showing through on many feathers, especially on upperparts; throat purple or dark wine-red; wings, tail and scapulars black with very narrow blue edges, these broader on median and lesser wing-coverts; has primaries P9 and P10 thin and tapering, slightly recurved, P6 and P7 with barbs of outer webs forming a fringe (not interlocking), and inner secondaries very long; iris dark brown; bill blackish, greyer base of lower mandible; legs dark grey. Female is dark greyish-brown with pale buffy scaling above, similar but paler below and more obscurely scaled, with plain greyish-buff throat and buffy undertail-coverts. Immature is like adult female, flight-feathers with buff tips (tend to wear off); male much as adult when just over a year old. Voice. Male call a soft, medium-pitched "hooo", repeated 2-3 times. Flying male makes faint whistling wing noise in normal flight, louder in display-flight.

Habitat. Canopy of humid forest; to 600 m, rarely to 1300 m.
Food and Feeding. Mainly fruit, also insects. Fruits especially large mistletoe berries (Loranthaceae), usually taken in fluttering sally. Recorded as taking flying termites (Isoptera) or ants (Hymenoptera) in flycatcher fashion from treetop perch. Often found together with *C. maynana*.
Breeding. In Colombia, female brooding downy chick at end of low branch of isolated tree, chick resting on small epiphyte, apparently no trace of nest material; calculated laying date mid-Jan. Male makes display-flights in treetops; when singing, erects crown and back feathers and fans tail. No other information.
Movements. Possibly some local movements, e.g. in Venezuela.
Status and Conservation. Not globally threatened. Reasonably common; generally more abundant in E parts of range than in W, where outnumbered by *C. maynana*. Occurs in many protected areas, including e.g. Imataca Forest Reserve and El Dorado, in Venezuela; Iwokrama Forest Reserve, in Guyana; Amacayacu National Park, in Colombia; Cuyabeno Reserve and Jatun Sacha Biological Station, in Ecuador; Manu National Park and Biosphere Reserve, in Peru; and Rio Cristalino Forest Reserve, in Brazil.
Bibliography. Allen (1995), Bates & Parker (1998), Best *et al.* (1997), Blake (1950), Brooks *et al.* (1999), Butler (1979), Chaves (2001),), Cohn-Haft *et al.* (1997), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Nicéforo (1947), Oren & Parker (1997), Ortiz & Carrión (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson (1997), Rutgers & Norris (1977), Schubart *et al.* (1965), Schürer & Bock (1995), Sick (1993, 1997), Snyder (1966), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Terborgh *et al.* (1984), Tostain *et al.* (1992), Willard *et al.* (1991), Zimmer & Hilty (1997), Zimmer *et al.* (1997).



PLATE 6

inches 4
cm 10

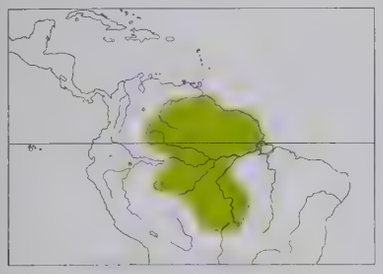
Genus *XIPHOLENA* Gloger, 1841

49. **Pompadour Cotinga**

Xipholena punicea

French: Cotinga pompadour **Spanish**: Cotinga Pompadour
German: Amazonien-Pompadourkotinga

Taxonomy. *Turdus puniceus* Pallas, 1764, South America = Surinam.
Forms a superspecies with *X. lamellipennis* and *X. atropurpurea*; only marginal range overlap with first of those in Brazil (W bank of lower R Tapajós, in W Pará). Monotypic.
Distribution. Extreme E Colombia (Arauca, Vichada S to N Vaupés), S & E Venezuela (S of R Orinoco), the Guianas, N & C Amazonian Brazil (E to Amapá and, S of Amazon, R Juruá E to W Pará and S to S Mato Grosso), NE Peru (Loreto) and extreme NE Bolivia (Serranía de Huanchaca); single record from SE Ecuador.



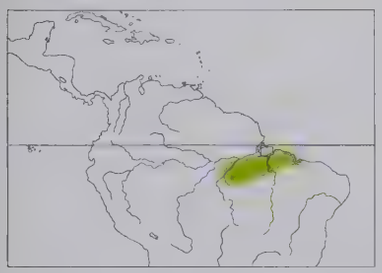
Descriptive notes. 19-20 cm; male 60-72 g, female 58-76 g. Distinctive; wide-based bill rather flattened dorsoventrally, slightly hooked at tip, rictal bristles absent. Male plumage has very heavy deposition of carotenoid pigments combined with structural modification of barbs, producing hard glossy surface; shining crimson-purple on head and body, paler on tertials and uppertail-coverts; secondary wing-coverts crimson-purple, greater coverts elongated and stiffened, pointed at tips, shafts white, rest of wing white, black tips on primaries; tail largely pale pink to white, more crimson-purple towards outer edges; iris pale yellow; bill dark brownish-horn; legs brownish-black, soles buff-coloured. Female is ash-grey, paler on throat and, especially, belly and undertail-coverts, blacker on wings and tail, outer edges of secondaries and greater coverts conspicuously white, those of median coverts whitish-grey, narrow whitish eyering. Juvenile resembles female, but eyes dark; immature male variable, passes through several stages, full adult plumage apparently acquired after three (presumably annual) wing moults. VOICE. Male call a loud, frog-like, rattling croak, given rarely; also rustling wing noise during display. Also loud "purp" by both sexes.
Habitat. Canopy of humid forest; to 1300 m. Found in various forest types along Amazon, including *campinarana*, *terra firme* and *igapó* forest on sandy soil.
Food and Feeding. Mainly fruit, some insects. Fruits of palms (including *Euterpe*) and *Ficus* and *Brosimum* (both Moraceae) recorded; occasionally flying ants (Hymenoptera) and termites (Isoptera), taken in sallies from treetops. Female-plumaged birds regularly, adult males rarely, accompany mixed-species foraging flocks.
Breeding. Calculated dates of onset of moult (presumably post-breeding) in all months of year, indicating no fixed breeding season. Male performs short display-flight from treetop perch. Single known nest a minute but deep open-work cup composed of a few woody tendrils, c. 18 m up in crotch of bamboo between main stem and side shoot; 1 egg. No other information.
Movements. Probably wanders, perhaps extensively, in search of fruit, but no details known.
Status and Conservation. Not globally threatened. Most numerous N of Amazon, from E Colombia E to the Guianas; S of Amazon records sparse, probably representing small local populations or wandering individuals. Occurs in several protected areas, including e.g. Imataca Forest Reserve and El Dorado, in Venezuela, Iwokrama Forest Reserve, in Guyana, and Jaú National Park, in Brazil.
Bibliography. Álvarez & Whitney (2003), Bates & Parker (1998), Beebe (1924b), Best *et al.* (1997), Blake (1950), Borgia *et al.* (1985), Cohn-Haft *et al.* (1997), Friedmann (1948), Gilliard (1941), Haffer (1997b), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Sick (1993, 1997), Snow, D.W. (1977c), Snyder (1966), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tostain *et al.* (1992), Whittaker (1996a, 1996b), Willard *et al.* (1991), Zimmer & Hilty (1997), Zimmer *et al.* (1997).

50. **White-tailed Cotinga**

Xipholena lamellipennis

French: Cotinga à queue blanche **Spanish**: Cotinga Coliblanco
German: Weißschwanz-Pompadourkotinga

Taxonomy. *Ampelis lamellipennis* Lafresnaye, 1839, South America = Belém, Pará, Brazil.
Forms a superspecies with *X. punicea* and *X. atropurpurea*; only marginal range overlap with first of those in Brazil (W bank of lower R Tapajós, in W Pará). Described race *pallidior*, from Santarém (lower R Tapajós), is inseparable. Monotypic.
Distribution. Lower Amazonian Brazil S of Amazon, from Pará (W bank and drainage of lower R Tapajós) E to N Maranhão.



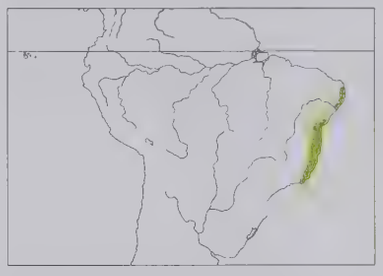
Descriptive notes. 19-20 cm. Distinctive; wide-based bill rather flattened dorsoventrally, slightly hooked at tip, rictal bristles absent. Male plumage has very heavy deposition of carotenoid pigments combined with structural modification of barbs, producing hard glossy surface; head and body shining purplish-black, tail and most of wings white; greater secondary coverts elongated and stiffened, pointed at tips, shafts white; iris pale yellow; bill dark brownish-horn; legs brownish-black, soles buff-coloured. Female is ash-grey above, blacker on wings and tail, outer edges of secondaries and greater coverts conspicuously white, those of median coverts whitish-grey, paler grey below, somewhat mottled on breast, narrow whitish eyering. Immature male resembles female, full adult plumage apparently acquired after two or three wing moults. VOICE. Loud "purp" given by both sexes.
Habitat. Canopy of humid forest; to 400 m.
Food and Feeding. Almost unknown. Probably mainly fruits; single record of *Phytolacca* fruit eaten.
Breeding. Calculated dates of onset of moult (presumably post-breeding) in nearly all months of year, indicating no fixed breeding season. Male performs short display-flight from treetop perch. Single nest, with 1 egg, found in Nov; nest not described, located 5 m up in rubber tree.
Movements. None recorded.
Status and Conservation. Not globally threatened. Poorly known. Apparently nowhere common; as its congeners, however, it is a treetop bird easily overlooked in areas of unbroken forest.
Bibliography. Forrester (1993), Haffer (1997b), Hellmayr (1929), Meyer de Schauensee (1982), Oren & Parker (1997), Pinto (1953), Ridgely & Tudor (1994), Sick (1993, 1997), Snow, D.W. (1977c), Stotz *et al.* (1996), Teixeira & de Almeida (1997), Zimmer *et al.* (1997).

51. **White-winged Cotinga**

Xipholena atropurpurea

French: Cotinga porphyrion **Spanish**: Cotinga Aliblanco
German: Weißflügel-Pompadourkotinga

Taxonomy. *Ampelis atro-purpurea* Wied, 1820, River Mucuri, Espírito Santo, Brazil.
Forms a superspecies with *X. punicea* and *X. lamellipennis*. Monotypic.
Distribution. Coastal E Brazil from Paraíba S to N Rio de Janeiro.



Descriptive notes. 19 cm; male 58-65 g, female 56-67 g. Distinctive; wide-based bill rather flattened dorsoventrally, slightly hooked at tip, rictal bristles absent. Male plumage has very heavy deposition of carotenoid pigments combined with structural modification of barbs, producing hard glossy surface; shining blackish-purple on head and body, paler on tertials and uppertail-coverts; secondary wing-coverts as body, greater coverts (not elongated) with pointed tips, rest of wing white, black tips on primaries, outer webs of primaries with thickened rami; iris pale yellow; bill dark brownish-horn; legs brownish-black, soles buff-coloured. Female is ash-grey above, blacker on wings and tail, outer edges of wing-coverts conspicuously white, underparts slightly paler grey, somewhat mottled on breast, narrow whitish eyering. Immature male resembles female, full adult plumage apparently acquired after four or five moults of remiges and rectrices. VOICE. Male call a croak, apparently similar to that of *X. punicea*; also high-pitched "chíu" notes. Loud "purp" given by both sexes. Whispering wing noise by both sexes in normal flight; quite loud wing noise by adult male in display-flight.
Habitat. Mainly dense humid forest; also, in N of range, more open forest, and in drier areas (up to more than 100 km from coast in Pernambuco and Alagoas) relatively low, semi-deciduous forest; occasionally in low-growing (to 7-8 m) scrubby forest in sandy areas near coast. Sea-level to 900 m.
Food and Feeding. Mainly fruit, also insects; occasionally flowers, including those of family Malpighiaceae, also buds and stamens of *Pachira* (Bombacaceae). Wide variety of fruits taken, with preference for those of 4-12 mm diameter; 29 species recorded, from 18 families, including Moraceae (4 species), Myrtaceae (4 species) and Lauraceae (3 species). Insect food includes caterpillars (Lepidoptera) and orthopterans (Tettigoniidae).
Breeding. Incubation recorded in Oct and egg-laying in Nov; gonad and moult data indicate season Oct-Feb. Displaying male makes upward flight of several metres from treetop perch, performs half-turn, descends steeply, with wings and tail conspicuously spread, to same perch; descent accompanied by loud wing noise. Nest a deep cup, very small for size of bird, apparently made of rootlets, perhaps with some moss, placed in fork between two vertical stems high up in tree; two recorded, one more than 15 m above ground, other 20 m up. Clutch almost certainly 1 egg; incubation and fledging periods not recorded.
Movements. None recorded.
Status and Conservation. ENDANGERED. CITES I. Restricted-range species: present in Atlantic Slope of Alagoas and Pernambuco EBA and Atlantic Forest Lowlands EBA. More or less confined to 13 protected areas (totalling 992·2 km²) along coast. Has undoubtedly suffered reduction in numbers and fragmentation of range as a result of extensive destruction of lowland forest; over 60% of Atlantic Forest habitat lost since 1980. Recent study, however, indicates greater abundance, and also wider habitat tolerance, than formerly supposed; census transects in two areas in Bahia suggested between 310 and 1187 individuals in 60·3 km²; global population estimated at 12,000-13,000 individuals. Most important areas for this species seem to be Pedra Talhada and Desengano State Parks, Una and Sooretama Biological Reserves, Monte Pascoal National Park and Linhares Natural Reserve. Continuing deforestation a threat, as also are fires, and illegal logging and other activities. Inadequate law enforcement in protected areas a major problem; several of those in which this species occurs are under threat, and the future of, especially, Monte Pascoal National Park is particularly insecure.
Bibliography. Anon. (2002b), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga, Jones & Scott (1987), Collar, Gonzaga, Krabbe *et al.* (1992), Corderio (2000), Cracraft (1985), Forrester (1993), Hellmayr (1929), King (1978/79), Laps (2000), Meyer de Schauensee (1966, 1982), Pinto & Camargo (1961), Ridgely & Tudor (1994), Scott & Brooke (1985), Sick (1970, 1972, 1979a, 1993, 1997), Snow, D.W. (1977c), Stattersfield & Capper (2000), Stotz *et al.* (1996), Teixeira & de Almeida (1996a, 1996b, 1997), Teixeira & Luigi (1990), Tobias *et al.* (1993), Zimmer *et al.* (1997).

Genus *CARPODECTES* Salvin, 1865

52. **Snowy Cotinga**

Carpodectes nitidus

French: Cotinga neigeux **German**: Grauscheitelkotinga **Spanish**: Cotinga Níveo

On following pages: 53. Yellow-billed Cotinga (*Carpodectes antoniae*); 54. Black-tipped Cotinga (*Carpodectes hopkei*); 55. Black-faced Cotinga (*Conioptilon mcilhennyi*); 56. Bare-necked Fruitcrow (*Gymnoderus foetidus*).

Taxonomy. *Carpodectes nitidus* Salvin, 1865, Tucurriquí, Costa Rica.
Very closely related to *C. antoniae* and sometimes treated as conspecific, but differs in, especially, bill colour; the two replace each other geographically. Both have been considered conspecific with *C. hopkei* by some authors. Monotypic.
Distribution. Caribbean slope from NW Honduras S to extreme W Panama.



Descriptive notes. 19·5-21 cm; mean 105 g. Wide-based bill with ridged culmen, tip of upper mandible notched, distinctly uncinate; rictal bristles absent in male, slightly developed in female. Male is white, with light bluish-grey crown, very light bluish-grey wash on upperparts and part of wings; flight-feathers broad and rounded at tip; iris dark brown; bill grey, darker on culmen; legs blackish, dull brown pads of toes. Female is brownish-grey above, darker on crown, wings and tail blackish, wing-coverts and inner flight-feathers edged white and greyish-white; rather pale grey below, paler on chin, fading to white on belly, flanks and undertail-coverts; secondaries notably less broad than male's. Immature is like female; subadult male resembles adult, but flight-feathers with dark markings, tail and rump with tendency to grey wash. Voice. Male call seldom heard, consists of 2-6 rapidly repeated notes, between "chü" and "chee".
Habitat. Canopy of humid forest and adjacent tall secondary growth; to c. 750 m.
Food and Feeding. Fruits, especially of Lauraceae, mistletoes (Loranthaceae) and figs (*Ficus*); plucked either while perched or in brief flight sally.
Breeding. Data only from Costa Rica (three records). Egg laid in late Mar or early Apr, downy nestling on 21st Mar, and young fed in nest in Apr. One nest described in detail, a very small shallow cup made of small dry twigs and woody tendrils, placed 7·5 m up at junction of four branches in very exposed and leafless sandbox tree (*Hura crepitans*); two other nests 10-12 m above ground. Clutch 1 egg; incubation at least 27 days. No other information.
Movements. Evidently wanders widely, varying temporarily from common to rare in any one locality. Recent record (May 2001) from E Guatemala (Manabique Peninsula) assumed to involve wanderer from neighbouring Honduras.
Status and Conservation. Not globally threatened. Restricted-range species: present in Central American Caribbean Slope EBA. Little information on numbers, but population undoubtedly reduced by recent destruction of lowland forest.
Bibliography. Angehr (2000b, 2003), Bangs (1903), Beletsky (1998), Eisenmann (1955), Hellmayr (1929), Klebauskas & Pacheco (2000), Levey & Stiles (1994), Monroe (1968), Ridgely & Gwynne (1989), Ridgway (1907), Sánchez (2002), Slud (1960, 1964), Stiles (1983, 1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1972).

53. **Yellow-billed Cotinga**

Carpodectes antoniae

French: Cotinga à bec jaune **German**: Gelbschnabelkotinga **Spanish**: Cotinga Piquiamarillo
Other common names: Antonia's Cotinga

Taxonomy. *Carpodectes antoniae* Ridgway, 1884, Pirris, south-western Costa Rica.
Very closely related to *C. nitidus* and sometimes treated as conspecific, but differs in, especially, bill colour; the two replace each other geographically. Both have been considered conspecific with *C. hopkei* by some authors. Monotypic.
Distribution. Pacific slope of Costa Rica and W Panama.



Descriptive notes. 19·5-21 cm; mean 98 g. Wide-based bill with ridged culmen, tip of upper mandible notched, distinctly uncinate; rictal bristles absent in male, slightly developed in female. Male is white, with light bluish-grey crown, very light bluish-grey wash on upperparts; flight-feathers broad and rounded at tip; iris dark brown; bill yellow, blackish culmen; legs blackish, dull brown pads of toes. Female is brownish-grey above, darker on crown, wings and tail blackish, wing-coverts and inner flight-feathers edged white and greyish-white; rather paler grey below, fading to white on lower underparts; bill duller or browner than male's, and secondaries notably less broad. Immature is like female; subadult male resembles adult, but flight-feathers with dark markings, tail and rump often washed grey. Voice. Male call "cah" or "cow" like that of a dove (Columbidae) or a trogon (Trogonidae), ending in a throaty scrape.
Habitat. Mainly coastal mangroves and adjacent woodland; occasionally isolated trees in nearby open areas. Sea-level and slightly above; also recorded, rarely, up to c. 800 m.
Food and Feeding. Only fruits recorded, including those of Lauraceae, Melastomataceae and mistletoes (Loranthaceae).
Breeding. No information. Season probably Mar-Jun. Male seen to make conspicuous display-flights between bare topmost branches of tall forest tree, and longer flights from one treetop to another.
Movements. Evidently wanders widely, as recorded well inland from preferred coastal mangrove habitat; such nomadic movements probably occur outside breeding season, but only observation of apparent courtship display was inland, at upper limit of recorded altitudinal range.
Status and Conservation. ENDANGERED. Restricted-range species: present in South Central American Pacific Slope EBA. Rare, with very small global range. Survives in a few places on Pacific coast of Costa Rica; occurs in Carara Biological Reserve and Golfito Wildlife Refuge, and recorded irregularly (seasonally) in Corcovado National Park. Very few recent records from Panama, most from close to Costa Rica border; small population discovered in 1997 in Cerro Batipa Private Reserve, and small numbers possibly still exist farther E. Population was probably never large, but has declined considerably. Preferred mangrove habitat has been extensively destroyed, and most of the adjacent areas of lowland forest and scrub have likewise been eliminated.
Bibliography. Angehr (1998, 2000a, 2003), Capper *et al.* (1998), Collar & Andrew (1988), Collar *et al.* (1992), Cooper (1997), Delgado (1985), Eisenmann (1955), Engleman (1997a, 1997b), Hellmayr (1929), Ridgely & Gwynne (1989), Ridgway (1907), Skutch (1970), Slud (1964), Stattersfield & Capper (2000), Stiles (1983, 1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1972).

54. **Black-tipped Cotinga**

Carpodectes hopkei

French: Cotinga blanc **German**: Schwarzfleckenkotinga **Spanish**: Cotinga Blanco
Other common names: Hopke's/White Cotinga

Taxonomy. *Carpodectes hopkei* Berlepsch, 1897, San José, River Dagua, Colombia.
Has sometimes been treated as conspecific with *C. nitidus* and *C. antoniae*. Monotypic.
Distribution. SE Panama, and Pacific lowlands of W Colombia and NW Ecuador (S to S Pichincha).



Descriptive notes. Male 23·5-25 cm, female 22-23·5 cm. Wide-based bill with ridged culmen, tip of upper mandible notched, distinctly uncinate; rictal bristles absent in male, slightly developed in female. Male is all white (hardly any grey tinge on crown, back and tail), except for small blackish spots on tips of outer primaries and central pair of rectrices; flight-feathers broad and rounded at tip; iris orange to dark red; bill black; legs blackish, dull brown pads of toes. Differs from *C. nitidus* and *C. antoniae* in larger size, longer tail, purer white plumage, black spots on primaries and tail. Female is rather dark greyish above, wings and tail blackish, wing-coverts and inner flight-feathers edged white, paler grey below, becoming white on lower underparts, secondaries notably less broad than male's; differs from females of congeners in darker upperparts, less white at tips of wing-coverts. Immature is like female; subadult male resembles adult, but flight-feathers with dark markings, most or all of rectrices black-tipped. Voice. Not recorded.
Habitat. Humid forest, including mangroves, occasionally adjacent secondary woodland; to c. 900 m, once recorded at 1450 m.
Food and Feeding. Mainly fruit, but no details. Often recorded at universally popular *Cecropia* trees. Sometimes in small groups of 5-6 individuals.
Breeding. No information. Slow-flapping apparent display-flights by males.
Movements. Some seasonal movement suspected, but no detailed information.
Status and Conservation. Not globally threatened. Rare to locally fairly common. Occurs in Darién National Park, in Panama, and Río Palenque Science Centre, in Ecuador. Global population undoubtedly reduced by recent destruction of lowland forest, especially in NW Ecuador. Formerly considered Near-threatened; should perhaps be returned to that conservation category.
Bibliography. Angehr (2003), Best *et al.* (1997), Butler (1979), Chapman (1917c), Collar *et al.* (1994), Cracraft (1985), Delgado (1985), Eisenmann (1955), Hellmayr (1929), Hilty & Brown (1986), Jahn & Mena (2002h), Meyer de Schauensee (1945, 1982), Parker (1992a, 1992c), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), Salaman (1994), Stotz *et al.* (1996), Strewe (2000b), Wetmore (1972).

Genus *CONIOPTILON* Lowery & O'Neill, 1966

55. **Black-faced Cotinga**

Conioptilon mcilhennyi

French: Cotinga à face noire **German**: Schwarzgesichtkotinga **Spanish**: Cotinga Carinegro

Taxonomy. *Conioptilon mcilhennyi* Lowery and O'Neill, 1966, Balta, River Curanja, Loreto, Peru.
Affinities uncertain; probably closest to *Carpodectes*. Monotypic.
Distribution. SE Peru (Ucayali, Cuzco, Madre de Dios) and adjacent parts of Brazil (upper R Juruá, in Acre) and Bolivia (Pando).



Descriptive notes. 23 cm; two males 89 g and 91 g, one female 81 g. Bill wide at base, slightly hooked at tip, rictal bristles well developed, scattered feathers on chin and crown with hardened shiny tips; white powder-down abundant throughout all unfeathered parts of body, absent on head, also powdery bloom on dorsal surfaces of wing and tail feathers. Has head and throat black, partly bordered by whitish crescent behind ear-coverts; upperparts dark grey, darker on wings and tail; underparts grey, fading to white lower belly and undertail-coverts; iris dark reddish-brown; bill dark greyish-brown; legs dark olive-grey. Sexes similar; female on average somewhat smaller, perhaps slightly paler on underside. Immature undescribed; one apparently subadult female had much of plumage tipped or edged with white. Voice. Song an upwardly inflected "briiing"; another call, used frequently in counter-calling between pairs, a soft, downwardly inflected "peuw".
Habitat. Humid forest, especially swampy or seasonally flooded forest along lake and river margins; in Brazil, also recorded in *terra firme* forest well away from floodplains. Occurs up to 300 m, rarely 450 m.
Food and Feeding. Mainly fruit, plucked in hovering flight; also insects, winged ants (Hymenoptera) recorded; also, perhaps exceptionally, flower parts. Regularly associates with other frugivorous species at fruiting trees, especially at large fig trees (*Ficus*).
Breeding. Two nests recorded, both in Sept in Peru; laying in late Aug or Sept in Bolivia. Both nests very small: one, made of fine plant fibres and sited c. 15 m above ground at fork of two narrow branches in *Cecropia* tree, was being built in second half of Sept; the other, described as "sufficiently small as to be invisible", was c. 35 m above ground at fork of two branches in *Ceiba* tree, and contained a single well-developed nestling, attended by both parents, end Sept. No further information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in South-east Peruvian Lowlands EBA. Not well known. Probably not uncommon. Lives in habitat where

widespread human disturbance is unlikely. Occurs in Manu National Park and Biosphere Reserve, in Peru.

Bibliography. Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cracraft (1985), Fitzpatrick (1982), Lloyd (2000), Lowery & O'Neill (1966), Mazar Barnett & Kirwan (2001), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Robinson (1997), Robinson & Terborgh (1997), Sagot (1998), Stotz *et al.* (1996), Terborgh *et al.* (1984), Tobias (2003b), Whittaker & Oren (1999), Williams (1995b).

Genus *GYMNODERUS*

E. Geoffroy Saint-Hilaire, 1809

56. **Bare-necked Fruitcrow**

Gymnoderus foetidus

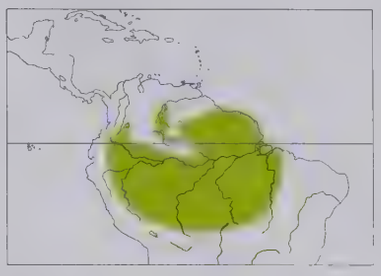
French: Cotinga à col nu **German**: Nackthalskotinga **Spanish**: Cuellopelado

Taxonomy. [*Gracula*] *foetida* Linnaeus, 1758, Surinam.

No obvious close relatives. Monotypic.

Distribution. Lowland forests of Amazonia and upper R Orinoco drainage, from SE Colombia (also extending N along base of Andes to W Meta), S Venezuela (Amazonas) and the Guianas S to E Ecuador, E Peru, Brazil (E to R Tocantins drainage and S to S Mato Grosso, including upper R Paraguai drainage) and C Bolivia; in N, apparently absent from much of R Negro drainage.

Descriptive notes. Male 34-38 cm, 331-359 g; female 30-34 cm, 1 bird 220 g. Bill smaller, less stout and more flattened dorsoventrally than in other fruitcrows, legs and feet strong; plumage of feathered parts of head dense, short and velvety, large powder-down patches on flanks. Male is black, with most of wing silvery grey; parts of head side and most of neck unfeathered, with blue or bluish-white skin extended into elaborate folds; iris variable, greyish-cream to grey or dark crimson; bill grey, black tip; legs leaden grey. Female is smaller than male, almost plain slaty grey, some pale scaling; folds on neck skin less developed. Juvenile predominantly white; immature progresses through succession of stages with whitish feather edges and, in male, dusky speckling on pale wing feathers; full adult plumage acquired after third wing moult. Voice. A deep bellowing "oooooooo" like a fog-horn, reminiscent of call of *Cephalopterus ornatus*.



Habitat. Mainly forested banks of rivers and lakes, and seasonally flooded forest; to 500 m.

Food and Feeding. Mainly fruit, including *Oenocarpus*, *Cecropia* and *Euterpe*, as well as arboreal melastome (perhaps *Miconia*). Also, to a lesser extent, insects, including large ones, e.g. mantids (Mantidae) and grasshoppers (of family Locustidae); also flying ants (Hymenoptera) or termites (Isoptera), taken by sallying high above treetops. Fruit taken while perched. Unlike other cotingids, runs actively along tree branches when foraging.

Breeding. Laying probably in Sept-Feb at S end of range, on basis of records of moult (presumably post-breeding) becoming progressively later towards N. Three nests found, one described in detail, a very small, shallow cup, of lichens and fine tendrils, the latter coated with white fungus; placed 6-10 m above ground on thick horizontal tree branch. Clutch almost certainly 1 egg.

Movements. Regularly moves in high-flying flocks, conspicuous when crossing wide rivers. Uncertain whether these represent local movements or perhaps seasonal migratory movements.

Status and Conservation. Not globally threatened. Fairly common along banks of major rivers of Amazonia, forming flocks of 20 or more; less numerous in Guianan region. Occurs in several protected areas, e.g. Anavilhanas Ecological Station and Rio Cristalino Forest Reserve, in Brazil, and Tambopata-Candamo Reserved Zone and Manu National Park and Biosphere Reserve, in Peru.

Bibliography. Acheson & Davis (2001), Allen (1995), Bangs & Penard (1918), Bates & Parker (1998), Béraut (1970), Best *et al.* (1997), Blake (1962), Brooks *et al.* (1999), Davis (1993), Dubs (1992), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Lane (2003), Meyer de Schauensee (1982), Oren & Parker (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson (1997), Schubart *et al.* (1965), Sick (1993, 1997), Snyder (1966), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Terborgh *et al.* (1984), Tostain *et al.* (1992), Traylor (1958), Whittaker (1996a), Zimmer & Hilty (1997), Zimmer *et al.* (1997).



PLATE 7

inches 6
cm 15

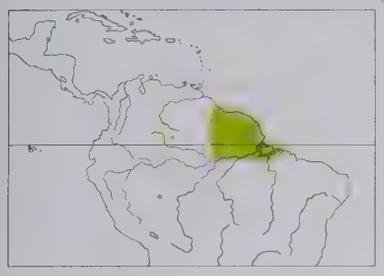
Genus *HAEMATODERUS* Bonaparte, 1854

57. **Crimson Fruitcrow**

Haematoderus militaris

French: Coracine rouge **German**: Karminkotinga **Spanish**: Pájaro-militar

Taxonomy. *Coracias ? Militaris* Shaw, 1792, Cayenne.
Relationships uncertain. Monotypic.
Distribution. Extreme S Venezuela (Cerro de la Neblina), the Guianas and N & SW Brazil (E from E Roraima and Manaus area, and from lower R Tocantins E to Belém area of NE Pará; also Rondônia).



Descriptive notes. 33-35 cm. Bill strong, hooked at tip, wide basally, rictal bristles well developed, legs relatively short, feet small. Male has feathers of crown, upper back and breast highly modified, narrow and much elongated; shining crimson on head and body, breast darker crimson (feathers up to at least 105 mm long, very glossy towards tips); wings and tail dusky brown; iris dark brown; upper mandible dark reddish, lower mandible pale reddish-brown, darker along sides; legs blackish. Female is rosy crimson on head and underparts, rest of plumage dusky brown. Immature is similar to female. Voice. Male call a short, low-pitched "bock".
Habitat. Humid forest; to 200 m.
Food and Feeding. Large insects; also takes some fruit. Insects recorded as eaten include beetles (Coleoptera), cicadas (Cicadidae) and large orthopterans; taken either in foliage of forest canopy or in sallies from treetops. Fruit-eating long suspected but only recently registered: male observed to eat fruits of *Cecropia sciadophylla* in Surinam. Occasionally in small groups of 3-4 individuals.
Breeding. Nest-building recorded in Brazil (Manaus area) in Sept. Male flight-display with shallow beats to c. 30 m above forest, slow descent with wings raised and tail spread, final spiralling flight into trees. Nest apparently very small, in slight hollow at fork of horizontal branch in centre of c. 20-m high tree. No other information.
Movements. Seasonal movements suspected, but no details.
Status and Conservation. Not globally threatened. Status not well known. Seems to be generally rare, local concentrations perhaps occurring in some areas at times; not reported in recent years from Belém area of Brazil. Was for long known only from the Guianas, and a few localities in lower Amazonian Brazil; range recently greatly extended by records from extreme S Venezuela and SW part of Amazonia (Rondônia); these records, far to W of previously known range, perhaps suggest shift of "centre of gravity" of population.
Bibliography. Bierregaard *et al.* (1987), Cohn-Haft *et al.* (1997), Cracraft (1985), Forrester (1993), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Mazar Barnett, Kirwan & Tobias (1998b), Meyer de Schauensee (1982), Novaes (1978a), Ottema (2002), Ridgely & Tudor (1994), Sick (1993, 1997), Snyder (1966), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tostain *et al.* (1992), Whittaker (1993).

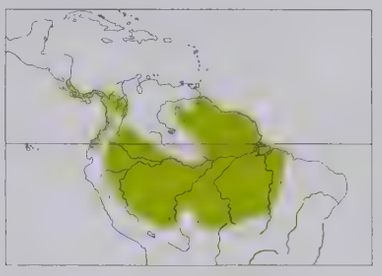
Genus *QUERULA* Vieillot, 1816

58. **Purple-throated Fruitcrow**

Querula purpurata

French: Coracine noire **German**: Purpurbrustkotinga **Spanish**: Cotinga Quérula
Other common names: Red-breasted/Scutated Fruitcrow

Taxonomy. *Muscicapa purpurata* Statius Muller, 1776, Cayenne.
Relationships uncertain. Size (as indicated by both wing lengths and weights) varies geographically, birds from Andean foothills of Peru being considerably larger, and those from Central America somewhat larger, than birds from the Guianas; differences, however, considered not sufficient for naming of any geographical races. Monotypic.
Distribution. Caribbean side of extreme S Nicaragua, Costa Rica and W Panama and, E from Canal Zone, on both sides S to N & W Colombia (from Gulf of Urabá E to middle Magdalena Valley, and W of Andes) and NW Ecuador; also Amazonia from E Colombia (S from Meta and Vaupés), S & E Venezuela (S of R Orinoco) and the Guianas S to SE Peru, C Brazil (S to middle reaches of S tributaries) and N Bolivia; in N, apparently absent from most of R Negro drainage.
Descriptive notes. Male 28-30 cm, female 25-28 cm; male 105-122 g and female 93-101 g (Central America), male 91-115 g and female 87-104 g (the Guianas), male 112-133 g and female 100-114 g (Peru). Bill strong, broad-based, somewhat flattened dorsoventrally, hooked at tip, rictal bristles well developed; wings long for body size, with relatively long secondaries. Male is black, with large, shiny dark purple-red or crimson throat patch (throat feathers highly modified, barbs flattened and lacking barbules); iris brown to dark brown; bill grey, blacker tip of upper mandible; legs slaty black. Female is entirely black. Immature is similar to female; crimson throat feathers of adult male appear gradually, not closely linked to wing moult. Voice. Mellow disyllabic "oo-waa", typically repeated at short intervals; also variety of harsher notes, including loud harsh "wak-wak-wak-wak-wak" in alarm.
Habitat. Humid forest and mature secondary woodland; mostly below 700 m.
Food and Feeding. Fruit and insects. Nestling diet includes cicadas (Cicadidae), katydids (Tettigoniidae), mantids (Mantidae), moths (Lepidoptera) and unidentified larvae, little fruit. Food items usually plucked or seized from vegetation in swooping flight; fruits borne on strong stalks that afford a foothold may be taken from perched position. Searches for insects in typical cotingid fashion, by perching quietly and scanning surrounding vegetation. Forages in small groups.



Breeding. Laying probably in second half of year (wet season) in Panama; in the Guianas recorded in Feb and Apr, but moult records indicate much more extended breeding in first half of year. Lives in small groups of 3-8 individuals, all of which jointly attend single nest, and take part in defence of it. Nest a loose cup of twigs, lined with very fine terminal twigs (of understorey *Eugenia* tree in the two cases recorded), 11-23 m up in tree fork. Clutch 1 egg (records of 2 somewhat doubtful); incubation 25 days; nestling often fed by several of group-members, entirely with insects until 12 days old, after which small proportion of fruit included; fledging period 32-33 days.
Movements. None recorded. In only detailed study, apparently stable groups of individuals, perhaps family parties, ranged over areas of forested valley 250-350 m in extent.
Status and Conservation. Not globally threatened. Quite common in some areas. Occurs in a number of protected areas, including e.g. Si-a-Paz Reserve, in Nicaragua; Los Katíos National Park, in Colombia; Imataca Forest Reserve and El Dorado, in Venezuela; and Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru. Wide geographical range and toleration of different forest types, including secondary growth, should ensure future survival.
Bibliography. Allen (1961, 1995), Angehr & Aucca (1997), Bangs & Penard (1918), Best *et al.* (1997), Blake (1950, 1962), Brooks *et al.* (1999), Butler (1979), Canaday & Jost (1997), Eisenmann (1955), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (1997, 2003), Hilty & Brown (1986), Merizalde (1975), Meyer de Schauensee (1982), Moermond & Denslow (1985), Oren & Parker (1997), Ortiz & Carrión (1991), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Robinson & Terborgh (1997), Schubart *et al.* (1965), Sick (1993, 1997), Slud (1960, 1964), Snow (1971a), Snyder (1966), Stiles & Skutch (1989), Stotz *et al.* (1996), Terborgh *et al.* (1984), Tostain *et al.* (1992), Traylor (1958), Velásquez (1991), Wetmore (1972), Willis & Eisenmann (1979), Zimmer *et al.* (1997).

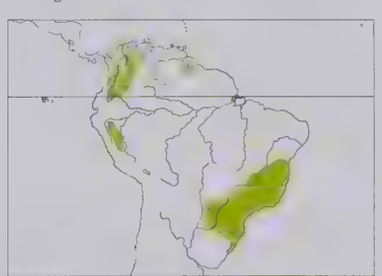
Genus *PYRODERUS* G. R. Gray, 1840

59. **Red-ruffed Fruitcrow**

Pyroderus scutatus

French: Coracine ignite **German**: Rotkehlkotinga **Spanish**: Yacutoro

Taxonomy. *Coracias scutata* Shaw, 1792, Nova Friburgo, Rio de Janeiro, Brazil.
Genus probably closest to *Cephalopterus*. Five subspecies recognized.
Subspecies and Distribution.
P. s. occidentalis Chapman, 1914 - W Andes and W slope of C Andes of Colombia, and W slope in NW Ecuador.
P. s. granadensis (Lafresnaye, 1846) - Sierra de Perijá (on Colombia-Venezuela border), N & W Venezuela (Andes, and coastal mountains E to Distrito Federal) and E Andes and E slope of C Andes of Colombia.
P. s. masoni Ridgway, 1886 - Andes of N & C Peru.
P. s. orenocensis (Lafresnaye, 1846) - E Venezuela (NE Bolívar) and adjacent N Guyana.
P. s. scutatus (Shaw, 1792) - SE Brazil (Bahia and S Goiás S to Rio Grande do Sul), E Paraguay and NE Argentina (Misiones).



Descriptive notes. Male 43-46 cm, two birds (*scutatus*) 413 g and 419 g; female 36-39 cm, two birds (*scutatus*) 350 g and 390 g, two (*granadensis*) 300 g and 375 g. Bill strong and corvid-like, rictal bristles wiry and recurved; feathers of throat-ruff with distal ends of barbs conspicuously flattened, tips tending to be crimped or crinkled. Male nominate race is glossy black, except throat to upper breast orange with red feather tips, some warm brown spots on breast; iris blue to dark brown; bill light grey-blue to blackish; legs slaty grey to black, dull yellow-green soles. Female differs from male in smaller size, brown or grey-brown eyes, dark greyish or blackish (darkest above) bill. Immature is similar to adult, but red feathers of ruff less bright and glossy. Races vary mainly in plumage colour: *granadensis* resembles nominate, but somewhat more brown spotting on breast; *orenocensis* is duller and less glossy above, frontal feathers stiff, tending to produce median crest, underparts below breast entirely brown; *masoni* is similarly dull above, ruff deepest in colour with fringes approaching crimson-red; *occidentalis* has fringes of ruff least bright, lower underparts brown. Voice. Male advertising call a double boom consisting of two brief, but intense, hollow-sounding pulses of sound.
Habitat. Forest and forest borders, mainly humid and montane forest; lowland and locally drier forest in E Venezuela and Guyana; locally in introduced ash (*Fraxinus*) woodland adjacent to native forest in Colombia. Nominate race to 1050 m, *orenocensis* to 900 m, other races 650-2700 m.
Food and Feeding. Fruit, and large insects. Many kinds of fruit recorded, from large ones (e.g. palms, nutmegs) to small ones (*Cecropia*, *Dendropanax*). Adults eat mainly fruit; diet of younger nestlings mainly insects, both adult and larval. Fruit taken either in short aerial sallies or while perched.
Breeding. Laying in Mar-Jul, peak Apr-May, in C Andes of Colombia. Lek display rarely seen, small groups of males gather close together on perches up to c. 6 m above ground, display by

On following pages: 60. Bare-necked Umbrellabird (*Cephalopterus glabricollis*); 61. Amazonian Umbrellabird (*Cephalopterus ornatus*); 62. Long-wattled Umbrellabird (*Cephalopterus penduliger*); 63. Capuchinbird (*Perissocephalus tricolor*).

leaning forward while calling, throat feathers extended and hanging loosely, then perch erect and flare bib laterally. Reliable information otherwise only from Colombia (C Andes). Nest an open, shallow cup (allowing light to pass through), base mainly of twigs, cup exclusively of stripped fronds of the fern *Nephrolepis* (Davalliaceae), sited 5-8 m up on slender tree branch. Clutch 1 egg; incubation period not recorded; nestling fed mainly with insects until 10 days old, increasing proportion of fruit thereafter, fledging period 30-35 days.
Movements. Mostly resident. Tendency for individuals of Brazilian population (nominate) to appear briefly in areas unsuitable for residence (interior of São Paulo city; one found dead in Sorocaba city) indicates movements other than merely local, but nature of these not understood.
Status and Conservation. Not globally threatened. Uncommon to rare, and generally local. Populations in some areas reduced by deforestation. Occurs in many protected areas, including e.g. Sierra Nevada National Park, in Venezuela, Ucumarí Regional Park, in Colombia, Serra da Canastra National Park, Rio Doce State Park and Augusto Ruschi Biological Reserve, in Brazil, Ybicuí National Park (and at least four other reserves), in Paraguay, and Iguazú National Park, in Argentina. This species' ability to adapt to introduced *Fraxinus* woodland in Colombia (for both lek displays and breeding) indicates encouraging ecological flexibility, apparently unequalled by other large cotingas. Hunted for food in some areas.
Bibliography. Andrade (1996), Best *et al.* (1997), Butler (1979), Canevari *et al.* (1991), Chapman (1914), Chebez (1994), Chebez *et al.* (1999), Collar *et al.* (1987), Cracraft (1985), Ferreira de Vasconcelos & Lamas (2000), Fjeldså & Krabbe (1990), Fraga & Narosky (1985), Guerrero (2002a), Guix (1995), Hayes (1995), Hellmayr (1929), Hilty (1985, 2003), Hilty & Brown (1986), Lowen, Bartrina *et al.* (1996), Lowen, Clay *et al.* (1995), Meyer de Schauensee (1982), Negret (2001), Ortiz & Carrión (1991), de la Peña (1989), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), do Rosário (1996), Saibene *et al.* (1996), Schubart *et al.* (1965), Serrano (1994), Sick (1993, 1997), Stotz *et al.* (1996), Zimmer (1936a).

Genus *CEPHALOPTERUS*

E. Geoffroy Saint-Hilaire, 1809

60. Bare-necked Umbrellabird

Cephalopterus glabricollis

French: Coracine ombrelle **German**: Nacktkehl-Schirmvogel **Spanish**: Paragüero Cuellicalvo

Taxonomy. *Cephalopterus glabricollis* Gould, 1851, Chiriquí, 8000 feet [c. 2440 m], Panama.
May form a superspecies with *C. ornatus* and *C. penduliger*; all three suggested by some as being possibly conspecific, but this considered unlikely. Monotypic.
Distribution. Mountains and surrounding foothills and lowlands of Costa Rica (E from Cordillera Guanacaste) and Panama (E to Veraguas).



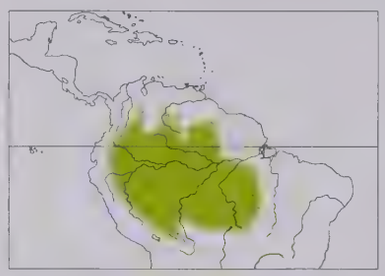
Descriptive notes. Male 41 cm, 450 g; female 36 cm, 320 g. Highly distinctive, with large crest; bill large, corvid-like. Male is black; umbrella-like crest, feathers outwardly curling and terminating in brush of hair-like barbs, may be lowered so as to cover almost whole of bill or held straight up (laid back in flight); has large patch of bare, inflatatable scarlet skin covering throat, side of neck and upper breast, with thin central tassle tipped with elongated feathers; underwing mainly grey, with a little white near bend of wing; iris dark brown; upper mandible black, lower mandible plumbeous; legs plumbeous to black. Female is smaller than male, duller slaty black below, crest much reduced, appearing flat; small bare patch on side of neck. Juvenile resembles female, but greyer, crest shorter, smaller area of bare skin on neck; immature plumage not well known, but at least one subadult stage before male acquires full adult plumage. Voice. Male advertising call two resounding booms in quick succession, with accompanying dry hacking sounds; also, repeated throaty "oooaaahh" calls during interactions.
Habitat. Primary forest; 750-2100 m in breeding season, lowlands to 500 m in rest of year.
Food and Feeding. Mainly fruit, supplemented by lizards, frogs and large insects. Plant families recorded in diet include Arecaceae, Flacourtiaceae, Lauraceae, Cecropiaceae, Marcgraviaceae, Passifloraceae, Piperaceae. Food items plucked from vegetation during sallies or gleaned during hops along branches; larger items of animal food beaten against perch before swallowing.
Breeding. Laying recorded in Apr in Costa Rica; probable season, indicated by male display, Mar-May or Jun. Male displays from subcanopy perch, in loose group with other males; leans forward, bare red-skinned wattle conspicuously inflated, and calls. One nest found, in Costa Rica, a substantial cup, bulkier than nests of other large cotingids, of twigs, leaves and moss, c. 5 m up in fork of relatively isolated small tree; 1 egg; incubation at least 24 days.
Movements. Regular seasonal migration in Costa Rica, spending much of year in lowlands and foothills, females mainly below 200 m, males at 100-500 m, and moving up into mountains in breeding season; present Mar-Aug at 750-1300 m in Monteverde Forest Reserve. Probably similar movements in Panama.
Status and Conservation. VULNERABLE. Restricted-range species: present in Central American Caribbean Slope EBA and Costa Rica and Panama Highlands EBA. Uncommon to rare, and local throughout range. Global population probably small; fragmented and believed to be declining. Numbers reduced by deforestation; even in protected and intact cloudforest in Costa Rica, some display sites used in 1985-1988 no longer occupied in mid-1990s. Whereas sufficient protected highland forests remain for breeding, e.g. La Amistad International Park and Monteverde Forest Reserve, in Costa Rica, much lowland forest in non-breeding areas already lost and surviving tracts severely threatened; in N Costa Rica, for example, 35% of remaining lowland forest was removed between 1986 and 1992, and the little habitat still left is under severe threat. Important non-breeding population in Sansán-Pondsock Wetlands Ramsar Site, in Panama, but even this legally protected site is threatened by clearance for agriculture. Preservation of forest corridors linking montane breeding areas with lowland wintering areas essential for this species' long-term survival.
Bibliography. Álvarez-Cordero *et al.* (1994), Angehr (2003), Angehr & Jordan (1998), Blake (1958), Chaves *et al.* (2003), Collar & Andrew (1988), Collar *et al.* (1992), Crenshaw (2002), Delgado (1985), Eisenmann (1955), Fogden (1993), Fogden & Fogden (1997), Hellmayr (1929), Levey & Stiles (1994), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Slud (1960, 1964), Stattersfield & Capper (2000), Stiles (1983, 1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wege (1993), Wetmore (1972).

61. Amazonian Umbrellabird

Cephalopterus ornatus

French: Coracine ornée **German**: Kurzlappen-Schirmvogel **Spanish**: Paragüero Ornado
Other common names: Umbrellabird, Ornate Umbrellabird

Taxonomy. *Cephalopterus ornatus* E. Geoffroy Saint-Hilaire, 1809, Barcelos, Rio Negro, Brazil.
May form a superspecies with *C. glabricollis* and *C. penduliger*; all three suggested by some as being possibly conspecific, but this considered unlikely. Monotypic.
Distribution. Almost entire Amazon Basin, from Andean foothills in Colombia, Ecuador, Peru and Bolivia, E to S Venezuela (drainage of upper and middle R Orinoco), locally SW Guyana, and Brazil (E to R Negro and R Xingu drainages, S to S Mato Grosso, just extending to headwaters of R Paraguai).



Descriptive notes. Male 48-51 cm, probably c. 500 g; female 41-43 cm, 1 bird 380 g. The largest Neotropical passerine. Highly distinctive, with huge crest; bill large, corvid-like. Male is black with bluish gloss, duller black on abdomen; umbrella-like crest, feathers outwardly curling and terminating in brush of hair-like barbs, shafts white (conspicuous when crest upstanding), may be lowered so as to cover almost whole of bill (laid back in flight); densely feathered wattle, up to 15 cm long, hanging from lower throat, usually held close to body; iris very pale blue-grey or pearly grey, almost white; upper mandible black, lower mandible plumbeous; legs plumbeous to black. Female is much smaller than male, crest and wattle much reduced, crest feathers without white shafts. Immature not well known; at least one subadult stage before male acquires full adult plumage. Voice. Male advertising call a deep, melodious, far-carrying boom. Variety of deep but not loud ventriloquial notes, churring or growling, by both sexes; female also a succession of disyllabic calls, e.g. "goh-ahh, go-uh", second syllable often prolonged for several seconds.
Habitat. Two distinct habitats. In Amazonia and R Orinoco region, forest along riverbanks and on river islands, and adjacent seasonally flooded forest (*várzea*), mainly below 300 m; humid forest, mainly at 900-1300 m, along base of Andes.
Food and Feeding. Fruits and large insects; occasionally lizards (*Anolis* recorded). Fruits include those of palms, *Byrsonima* (Malpighiaceae) and *Cecropia*. Insects comprise especially orthopterans and beetles (Coleoptera). Animal prey snatched from foliage and branches of trees, usually in flight; beaten against perch before swallowing.
Breeding. Laying recorded in Jul in Brazil (Mato Grosso); nest-building in Oct in SE Peru. Male displays from tree perch 10-25 m above ground, in loose group with up to 4-5 other males; leans forward to call, with crest spread, wattle expanded. Nest a very open structure of twigs, so thin that egg visible from below; two recorded, both in crown of small trees, 8 m and 12 m above ground. Clutch 1 egg; incubation and fledging periods not documented.
Movements. None recorded. Significance of single old record from mouth of Amazon (Mexiana I), well outside current range, uncertain.
Status and Conservation. Not globally threatened. CITES III. Scarce or rare in much of range; locally uncommon to fairly common. Numbers reduced, and often quite local in occurrence; in most areas, this presumably a result mainly of human persecution and exploitation for food, as riverine habitat has been little modified. Destruction of forest in Andean foothills has led to declines in W of range. Occurs in several protected areas, e.g. Amacayacu National Park, in Colombia, Podocarpus National Park, in Ecuador, Anavilhanas Ecological Station and Rio Cristalino Forest Reserve, in Brazil, and Noel Kempff Mercado National Park, in Bolivia.
Bibliography. Bates & Parker (1998), Best *et al.* (1997), Blake (1962), Bloch *et al.* (1991), Briones (1991), Butler (1979), Chapman (1921), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Hinojosa *et al.* (1998), Meyer de Schauensee (1982), Ortiz & Carrión (1991), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rutger & Norris (1977), Schubart *et al.* (1965), Servat & Pearson (1991), Sick (1954, 1955, 1993, 1997), Snyder (1966), Stotz *et al.* (1996), Traylor (1958), Zimmer & Hilty (1997), Zimmer *et al.* (1997).

62. Long-wattled Umbrellabird

Cephalopterus penduliger

French: Coracine casquée **German**: Langlappen-Schirmvogel **Spanish**: Paragüero Corbatudo

Taxonomy. *Cephalopterus penduliger* P. L. Sclater, 1859, Pallatanga, Chimborazo, Ecuador
May form a superspecies with *C. glabricollis* and *C. ornatus*; all three suggested by some as being possibly conspecific, but this considered unlikely. Monotypic.
Distribution. Pacific slope of Andes in SW Colombia (S from Valle) and W Ecuador (S to El Oro).



Descriptive notes. Male 41 cm, female 36 cm; 1 male 338 g. Highly distinctive, with large crest; bill large, corvid-like. Male is black with bluish gloss, duller black on abdomen; umbrella-like crest, feathers outwardly curling and terminating in brush of hair-like barbs, may be lowered so as to cover almost whole of bill or held straight up (laid back in flight); has wattle up to 35 cm in length, densely feathered on both sides and flattened dorsoventrally, hanging from lower throat (retracted and held close to body in flight); underwing extensively white; iris dark brown; upper mandible black, lower mandible slate-grey to rather pale bluish; legs plumbeous to black. Female is smaller than male, wattle small or almost absent. Immature little known; at least one subadult stage before male acquires full adult plumage. Voice. Male advertising call a loud "boooh", audible for c. 400 m, given at long intervals (19-63 seconds); also low grunting calls. Female call "aaugh", perhaps in alarm.

Habitat. Humid forest, also secondary growth and traditional farmland; 80-1800 m.
Food and Feeding. Fruits of species of palm (Arecaceae), nutmeg (Myristicaceae) and laurel (Lauraceae); also occasionally insects. Nestling in only nest recorded fed mainly with small vertebrates (lizards, frog, a small snake), also large insects, and perhaps fruit. Fruits mostly taken from perched position, but those of spiny palms (*Bactris*) plucked during hovering.
Breeding. Only one certain breeding record, laying in Jun in NW Ecuador. Male displays from tree branch at traditional "exploded" lek, with up to 8-10 other males; leans forward, greatly expands wattle, and calls. Single known nest a bulky cup of dry sticks c. 50 cm long, lined with thinner twigs, epiphyte roots, tree-fern twigs and mosses, 5 m above ground in crotch at top of tree-fern; contained 1 egg.
Movements. Resident. Recorded in the past as occasionally wandering down from main high-altitude forest habitat into adjacent lowlands, but recent discoveries of resident populations in low Andean foothills and lower mountains W of Andean main range suggest that species is mainly sedentary.
Status and Conservation. VULNERABLE. CITES III. Restricted-range species: present in Chocó EBA. Rare and local in all parts of range. Global population estimated at 2500-10,000 individuals. Has apparently suffered long-term and continuing decline as a result of forest destruction combined with direct human persecution, especially hunting for food. Occurs in several protected areas, but range is increasingly fragmented. In Colombia, records concentrated in Valle de Cauca and S Nariño, including Farallones de Cali National Park (Valle), but apparently no recent records from Munchique National Park (Cauca); in Ecuador, mostly in E Esmeraldas, Pichincha and adjacent parts of Imbabura. Recent discovery in Esmeraldas of apparently healthy resident population in Jatun Sacha Bilsa Biological Reserve, in lower mountains (400-700 m) W of main Andean range, raises hopes for species' long-term survival.
Bibliography. Allen (1998), Berg (2000), Best *et al.* (1997), Bloch *et al.* (1991), Butler (1979), Clay *et al.* (1995), Collar & Andrew (1988), Collar *et al.* (1994), Cracraft (1985), Hellmayr (1929), Hilty (1985, 1997), Hilty & Brown (1986), Hornbuckle *et al.* (1997), Jahn & Mena (2002a), Jahn *et al.* (1999), Karubian *et al.* (2003), King (1978/79), Low (1995), Meyer de Schauensee (1966, 1982), Negret (2001), Parker (1992a, 1992b, 1992c), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996), Strewe (2000b), Strewe & Renjifo (2002), Wege & Long (1995).

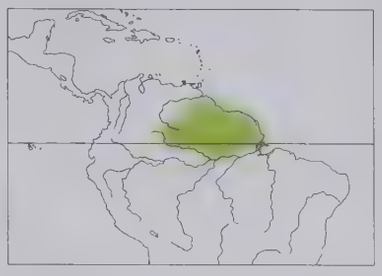
Genus *PERISSOCEPHALUS* Oberholser, 1899

63. **Capuchinbird**

Perissocephalus tricolor

French: Coracine chauve **German**: Kapuzinerkotinga **Spanish**: Pájaro-capuchino
Other common names: Calfbird

Taxonomy. *Corvus tricolor* Statius Muller, 1776, Cayenne.
Probably closest to *Cephalopterus*; possibly related also to *Pyroderus*. Monotypic.
Distribution. Extreme E Colombia (E Vaupés), S & E Venezuela (S Amazonas, E Bolívar), the Guianas and N Brazil N of Amazon (from upper R Negro and Manaus area E to Amapá).
Descriptive notes. 34·5-35·5 cm; male 320-402 g, female 267-367 g. Very odd-looking cotingid, with "cowled" head; bill long and strong, hooked at tip, legs and feet strong, claws strongly hooked.



Has crown and face bare except for sparse hair-like feathers, skin blue-grey, more greenish-blue below bill; back of head ochraceous brown, feathers dense and upstanding, forming "cowl"; upperparts ochraceous brown, dark brown on uppertail-coverts and upperwing-coverts, flight-feathers and tail nearly black; underparts as back but more rufescent, crissum orange-rufous, undertail-coverts curled, underwing-coverts white; iris dark brown; upper mandible dark grey, paler and bluer grey base, lower mandible mainly bluish-grey; legs plumbeous grey. Sexes alike, female somewhat smaller than male. Juvenile resembles adult, but has sparse downy (not bristly) feathers on bare skin of head. Voice. Male call is a loud, mooing "grr-aaa-oooo". Female a rasping "waaaaaa" as alarm (possibly also made sometimes by males); quiet "wark" as contact call.
Habitat. Humid forest; mostly occurs below 600 m, but in Venezuelan mountains present up to 1400 m.
Food and Feeding. Mainly fruits, also large insects; single record of bat (Chiroptera) seized from among foliage. Fruits mostly from trees in forest understorey or lower canopy; those of at least 8 plant families recorded in diet, with Lauraceae, Burseraceae and Arecaceae (*Euterpe*) of particular importance. Insects include especially orthopterans. Hanging fruits plucked in flight, those that are accessible taken while perched. Insect-searching technique consists of moving with short flights through understorey, perching motionless while scanning surrounding vegetation, and flying to snatch prey from foliage or branch.
Breeding. Laying in Feb-Apr in Guyana, Nov-Mar in Surinam and Jul and Oct in French Guiana; song and display at least Dec-Jul, strongest in Jan-Mar, in Venezuela. Male displays on subcanopy perch at lek, leans forward and inhales air ("grrr" part of call), then assumes very erect posture and, with "cowl" expanded, tail raised and curled undertail-coverts thrust out to form orange "globe" on each side, gives "aaa" call, then final bellowing "oooo" as it sinks back on perch to angle of c. 15 degrees beyond vertical; up to 15 or more subordinate males call and display on surrounding perches, do not defend any particular one, continually attempt to occupy dominant male's perch, also engage in paired displays with other subordinates; females regularly visit lek in groups, are highly aggressive towards one another; in Venezuela, there is usually a central lek, with various satellite leks, each attended by 2-3 males. Nest a thin, light platform of bifurcating twigs, with shallow cup made of fine terminal twigs of *Eugenia* tree, sited 3-6 m above ground in understorey tree. Clutch 1 egg; incubation period 26-27 days; fledging period not documented.
Movements. None recorded.
Status and Conservation. Not globally threatened. Locally fairly common in the Guianan forests, where populations concentrated around leks and easily detected. In Surinam, where most intensively studied, only one lek, comprising 8 males, in area of c. 9 km^2. Generally, numbers difficult to assess as, away from leks, wandering individuals generally silent and inconspicuous. Occurs in several protected areas, e.g. Imataca Forest Reserve and El Dorado (Venezuela), Iwokrama Forest Reserve (Guyana) and Brownsberg Nature Park (Surinam).
Bibliography. Blake (1950), Cohn-Haft *et al.* (1997), Friedmann (1948), Gilliard (1941), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1993, 1997), Snow, B.K. (1972), Snow, D.W. (1982), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain (1988a, 1988d), Tostain *et al.* (1992), Trail (1988, 1990), Whittaker (1996a).



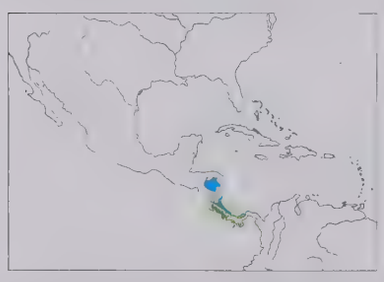
Genus *PROCNIAS* Illiger, 1811

64. Three-wattled Bellbird

Procnias tricarunculatus

French: Araponga tricaronculé **Spanish**: Campanero Tricarunculado
German: Dreilappenkotinga

Taxonomy. *Casmarhynchus tricarunculatus* J. Verreaux and E. Verreaux, 1853, Bocas del Toro, north-west Panama.
Almost certainly most closely related to *P. albus*, with which it shares several morphological characters. Monotypic.
Distribution. Breeds highlands of E Honduras (Sierra de Agalta), NW Nicaragua, Costa Rica and Panama (E to Azuero Peninsula). In winter in adjacent lowlands.



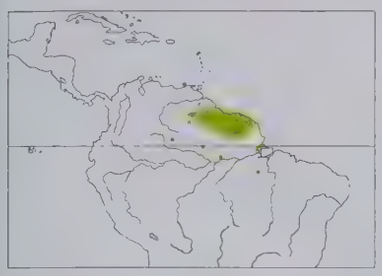
Descriptive notes. Male 30 cm, mean 210 g; female 25 cm, 145 g. Distinctive bellbird; bill very wide at gape, slightly longer than that of congeners. Male has head, neck and chest white, rest of plumage chestnut-rufous; bare black skin on lores and eyelids; three extensible bare blackish-grey wattles springing from base of upper mandible and corners of mouth; outer primaries modified, tips of inner vanes projecting beyond outer vanes and slightly hooked; iris dark brown; bill black, paler grey cutting edges; legs slate-grey, dull yellowish pads of toes. Female is olive-green above, duskier on primaries and their coverts, face with faint dull yellow streaks, underparts yellow, streaked olive-green, streaking reduced on throat and absent on crissum; cutting edges partially dull greenish-grey on lower mandible. Immature resembles female; male plumage acquired gradually, in course of c. 3 years, wattles begin to appear at c. 6-12 months. Voice. Male advertising call a very loud hammer-like "bock", either on its own or combined with less loud squeaks, whistles, and harsh or sharp monosyllabic or disyllabic notes; marked regional variation.
Habitat. Mountain forest, mainly at 1200-2300 m, sporadically higher following breeding; foothill and lowland forest, down to sea-level, in off-season.
Food and Feeding. Fruits, especially those of Lauraceae; very wide gape allows fruits of up to 25 mm in diameter to be eaten. Plucks items either while perched or during short aerial sally.
Breeding. Nest apparently unrecorded. Gonad data and male's displays indicate breeding mainly in Mar-Jun in Costa Rica. Male displays from treetop perch by calling and making short upward flutters; having attracted a female, descends to low perch in understorey tree, where mating takes place after further ritualized displays.
Movements. Pronounced altitudinal migrant, wintering in lowlands. Data from radio-tagging study revealed movement from highlands of NC Costa Rica down to lowlands of SE Nicaragua, thence to Pacific coastal areas of SW Costa Rica. In Panama most winter on Caribbean slope; vagrants, possibly displaced from former wintering areas, have occurred recently E to Panama Canal area.
Status and Conservation. VULNERABLE. Uncommon and local. Declining. Breeding areas include several protected reserves, most important of which are probably Sierra de Agalta National Park, in Honduras, Monteverde Forest Reserve, in Costa Rica, and La Amistad International Park, on Costa Rica-Panama border; in Panama found also in Coiba Island National Park, where it appears to be resident but is possibly only a non-breeding visitor. The primary reason for this species' decline is destruction of lowland forest to which it descends in non-breeding season; in N Costa Rica, for example, 35% of remaining lowland forest was removed between 1986 and 1992, and the little habitat still left is under severe threat. Most of this species' non-breeding areas are unprotected, but include Río Indio-Maiz Biological Reserve, in Nicaragua, Corcovado National Park, in Costa Rica, and Sansán-Pondsock Wetlands Ramsar Site, in Panama. Caribbean lowland habitats are under the most severe threat, and forest has virtually disappeared altogether in some parts; even nominally protected sites are facing the real risk of clearance for agriculture. Effective protection of all remaining lowland forest in the region is considered essential for the survival of this and several other globally threatened bird species.
Bibliography. Anderson *et al.* (1998), Angehr (2003), Angehr & Jordán (1998), Beletsky (1998), Beltran (1994), Blake (1958), Cooper (1997), Eisenmann (1955), Fogden (1993), Gibson & Wheelwright (1995), Hellmayr (1929), Howell & Webb (1995a), Levey & Stiles (1994), Monroe (1968), Powell & Bjork (2004), Ridgely & Gwynne (1989), Ridgway (1907), Santana & Milligan (1984), Slud (1964), Snow, B.K. (1977), Snow, D.W. (1973a), Stap (2000a, 2000b), Stattersfield & Capper (2000), Stiles (1983, 1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wenny (2000, 2001), Wenny & Levey (1998), Wetmore (1972), Wheelwright (1988, 1991).

65. White Bellbird

Procnias albus

French: Araponga blanc **German**: Einlappenkotinga **Spanish**: Campanero Blanco

Taxonomy. *Ampelis alba* Hermann, 1783, Cayenne.
Almost certainly most closely related to *P. tricarunculatus*, with which it shares several morphological characters. Two subspecies recognized.
Subspecies and Distribution.
P. a. albus (Hermann, 1783) - E & extreme S Venezuela (E Bolívar, Cerro de la Neblina), the Guianas and adjacent N Brazil (N Roraima and N Pará, also isolated records E from lower R Negro).
P. a. wallacei Oren & Novaes, 1985 - Serra dos Carajás, in SE Pará (Brazil).



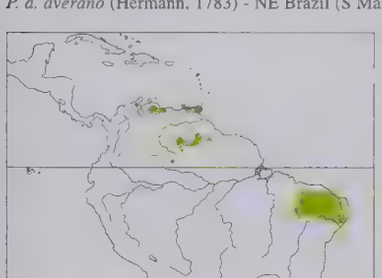
Descriptive notes. Male 28·5 cm, female 27·5 cm; male 210-215 g (*albus*), 219 g and 222 g (*wallacei*). Bill short, and very wide at gape. Male is unmistakable, one of the very few all-white landbirds; has single extensible wattle, black with short white star-like feathers, growing from base of upper mandible; outer primaries modified, tips of inner vanes projecting beyond outer vanes and slightly hooked; iris blackish; bill black, pale cutting edges; legs dark grey. Female is olive-green above, duskier on primaries and their coverts, olive-streaked yellow below; very similar to female of *P. tricarunculatus*, but shorter-billed, on average slightly smaller and shorter-tailed. Immature is similar to female; adult male plumage acquired gradually, wattle present but small at age of c. 1 year. Race *wallacei* differs from nominate in longer thinner bill, slightly grey-tinged throat. Voice. Male advertising call a very loud, sharp, bell-like "ding-ding"; also, very musical, more drawn-out, "doing doing".
Habitat. Humid forest; to c. 1250 m, probably breeding at higher levels. Generally occurs at lower elevations than *P. averano* (with some interdigitation) where ranges overlap in E Venezuela and Guyana.
Food and Feeding. Only fruit recorded; taken mainly in flight sallies, less often while perched; swallowed whole.
Breeding. Not recorded. Female seen to break off and drop fine twigs (of tree favoured as nest material by other cotingas) in Feb in S Guyana; movement upslope in first half of year and downward in second half probably indicative of breeding in about Feb-Jun; data on moult indicate less clearly defined breeding season than that of *P. tricarunculatus* or *P. nudicollis*. Male displays from treetop, with wattle greatly extended; calls with head and body held still, or, more loudly, utters one note as leans to right, then delivers second note with rapid leftward swing such that wattle (always hangs on right side of bill when call made with swing, although photographs suggest this may not be applicable for *wallacei*) flies out behind widely opened bill.
Movements. Little understood. Main range (presumed breeding area) centred in hilly areas of Guianan region, where some seasonal altitudinal movement (e.g. upslope movement recorded in Dec-Jun/Jul in SE Venezuela), with more extensive wandering into lowlands. Occasional records well away from main area, e.g. vagrant in Trinidad.
Status and Conservation. Not globally threatened, status uncertain; probably fairly common, but difficult to observe, and often locally distributed. Populations in remote highlands of E & S Venezuela and the Guianas should remain little disturbed for foreseeable future. Occurs in Canaima National Park and in Imataca Forest Reserve and El Dorado, in Venezuela.
Bibliography. Allen (1961), Burton (1976), ffrench (1991), Gilliard (1941), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Herklots (1961), Hilty (2003), Meyer de Schauensee (1982), Murphy (1995), Oren & Novaes (1985), Quelch (1892), Ridgely & Tudor (1994), Roth *et al.* (1984), Sick (1993, 1997), Snow, B.K. (1973), Snow, D.W. (1973a), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992).

66. Bearded Bellbird

Procnias averano

French: Araponga barbu **German**: Bartkotinga **Spanish**: Campanero Barbudo

Taxonomy. *Ampelis Averano* Hermann, 1783, no locality = north-east Brazil.
Almost certainly most closely related to *P. nudicollis*, with which it shares several morphological characters in male (bare thigh patch, modification of outer primaries). Two subspecies recognized.
Subspecies and Distribution.
P. a. carnobarba (Cuvier, 1816) - extreme N Colombia (N end of Perijá Mts), N, SE & extreme S Venezuela, N Brazil (Roraima) and adjacent W Guyana; also Trinidad.
P. a. averano (Hermann, 1783) - NE Brazil (S Maranhão and N Ceará S to Alagoas).



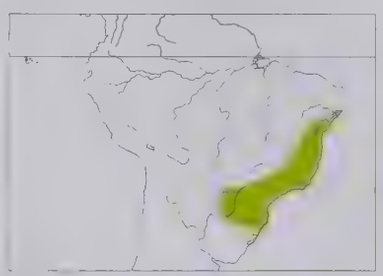
Descriptive notes. Male 28 cm, one bird 178 g; female 26·5 cm, three birds 127-135 g. Distinctive bellbird; short bill very wide at gape. Male nominate race has black from lores down to malar area and throat, bare throat covered with "beard" of extensible black wattles, rest of head chocolate-brown; remainder of plumage silvery white, except for black wings, also bare patch of pinkish skin on outer side of tibia; outer three primaries modified, tips with rounded extension of inner vane; iris very dark (grey towards outside, brown towards inside); bill black; legs grey to black. Female is olive-green above, duller and duskier on head, predominantly yellow below, streaked olive-green, plain pale yellow crissum. Immature is similar to female; after first moult male acquires sooty crown and throat, before adult colours gained 1-2 years later, wattles begin to develop at c. 1 year. Race *carnobarba* male differs from nominate in having body plumage pale grey (not silvery white). Voice. Male advertising call a very loud hammer-like "bock", also a repeated, much less loud "tonk-tonk-tonk"; in Venezuelan populations two very different disyllabic calls reported, "kay-kong" in N and an unmusical, almost hissing "bisset" in S.
Habitat. Humid forest and mature secondary woodland; mainly in hill country, to c. 1900 m. Generally occurs at higher elevations than *P. albus* (with some interdigitation) where ranges overlap in E Venezuela and Guyana.
Food and Feeding. Fruits. In detailed Trinidad study, those of 44 species (40 trees, 4 vines) recorded, the families Lauraceae and Burseraceae, with large nutritious fruits, being especially important. Fruits plucked mainly in flight sallies, less often from perched position, and swallowed whole.
Breeding. Laying in Apr-Nov in Trinidad, probably May-Sept in N Venezuela. Male gives loud advertising calls from high treetop perch; when female is attracted, he flies down to low perch in understorey tree and makes ritualized posturing displays, exhibiting pinkish thigh skin; if female joins him on perch, display culminates in loud "bock", followed by mating. Nests recorded only from Trinidad; an extremely flimsy construction, light showing through, of thicker basal twigs with small cup of very fine twigs, 2·4-15 m above ground, usually in outer branches of tree at a little distance from forest edge. Clutch 1 egg; incubation period c. 23 days; fledging period c. 33 days. Breeding success apparently low: of five nests, only one successful.
Movements. Mostly resident. Well-studied Trinidad population essentially sedentary, with some movement of immatures into low country adjacent to hills. In N Venezuelan coastal mountains, at least part of population moves from lower levels (200-500 m) to higher altitudes in Apr-May, presumably to breed.
Status and Conservation. Not globally threatened. Uncommon to fairly common, and local, in most of range; relatively common in Trinidad. Race *carnobarba* occurs in several protected areas. Even where relatively common, as in Trinidad's Northern Range, male's selection of display territories on hill ridges leads to patchy distribution. Nominate NE Brazilian population subject to heavy trapping for cagebird trade, which, combined with habitat destruction, has led to its comparative rarity, but the bellbird's tendency to disperse or migrate over considerable distances probably enables this population to exploit widely separated forest fragments; it occurs in Pedra Talhada State Park and a few other reserves.
Bibliography. Chapman (1931), Coimbra-Filho (1971), Cracraft (1985), Descourtilz (1983), ffrench (1986, 1991), Forrester (1993), Hellmayr (1929), Herklots (1961), Hilty (2003), Hilty & Brown (1986), Keast (1985), King (1978/79), Meyer de Schauensee (1982), Murphy (1995), Oniki & Willis (2002), Pinto (1940, 1948), Ridgely & Tudor (1994), Schäfer & Phelps (1954), Sick (1993, 1997), Silveira *et al.* (2003), Snow, B.K. (1970), Snow, D.W. (1973a), Snyder (1966), Stotz *et al.* (1996).

67. Bare-throated Bellbird

Procnias nudicollis

French: Araponga à gorge nue **German**: Nacktgesichtkotinga **Spanish**: Campanero Meridional

Taxonomy. *Ampelis nudicollis* Vieillot, 1817, Nova Friburgo, Rio de Janeiro, Brazil.
Almost certainly most closely related to *P. averano*, with which it shares several morphological characters in male (bare thigh patch, modification of outer primaries). Monotypic.
Distribution. E Brazil (Alagoas and S Minas Gerais S to S Mato Grosso and Rio Grande do Sul), E Paraguay and NE Argentina (Misiones).



Descriptive notes. Male 29 cm, 163-225 g; female 27 cm, 140-158 g. Distinctive bellbird; short bill very wide at gape. Male has plumage entirely white; skin of throat and area around eye bright greenish-blue, often bluer above gape (but can be greyish-blue or greener overall), bare except for inconspicuous black bristles; also bare patch of pinkish skin on outer side of tibia; outer three primaries modified, tips with rounded extension of inner vane; iris dark brown to dark grey; bill black, sometimes paler bluish-grey to lead-grey on lower mandible, especailly towards base; legs variable, dull brownish, purplish-flesh, dark grey, even whitish (very pale pink-grey). Female is rather dark and dull, dark grey head and throat, narrow ring of bare grey-blue skin around eye, some grey-blue also showing through scattered dark grey feathers on lores, tiny whitish streaks on throat and, especially, malar area and chin, olive above, wings dusky with dull olive margins, whitish or yellow with dark grey and olive streaks below (blacker and yellower on chest and breast side), pale areas increasingly larger downwards, belly predominantly pale yellowish, crissum entirely so; differs from females of congeners in darker throat, greyer and darker head. Immature similar to female; male acquires adult plumage gradually over course of c. 3 years, passes through intermediate stage with sooty-black crown. Voice. Male advertising call a very loud, explosive, metallic "bock", followed by series of similar but less loud notes tending to accelerate; of variable length, full performance may last 60 seconds.
Habitat. Humid forest; to c. 1000 m.
Food and Feeding. Fruits. In Alagoas and Bahia study areas, 16 fruit species (from 11 families) identified, among them four species of Myrtaceae, two each of Moraceae and Apocynaceae, and one each of Lauraceae and Burseraceae. In São Paulo study area, 10 species from 6 families (Arecaceae, Lauraceae, Moraceae, Myristicaceae, Myrtaceae, Sapindaceae). Data admittedly incomplete (cf. 44 species for *P. averano* in area less botanically rich). Individual fruits taken mainly in flight sallies, less often while perched; smaller fruits swallowed whole, larger ones in pieces; arillate fruits mandibulated until aril detached and seed dropped.
Breeding. Season in N of range (Alagoas and Bahia) probably Oct-Feb, based on male display and calling; in single known nest, laying probably late Oct. Male has permanent calling territory, usually in dense foliage in tree crown; rarely, displays on exposed perch. Nest a small cup constructed of epiphyte rootlets, some green moss on outside, inner lining of fungal fibres (*Marasmius*) mixed with moss and dry palm pinnules, placed 23 m up on twisted fork of vine stem hidden among tangle of woody vines in a 41-m *Manilkara* (Sapotaceae) tree. Clutch probably 1 egg, as suggested by nest size and presence of single nestling.
Movements. Not well understood; altitudinal movements likely, but uncertain whether or not regularly seasonal. Some evidence that the species may be migratory, at least in part, in SE Brazil and adjacent Paraguay; also, records from Argentina indicate that possibly only a transient visitor there. Has been suggested that it may follow complex migration route, perhaps linked to fruiting periods of trees.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Locally relatively common; rare in Argentina. Numbers have certainly declined as a result of destruction of E Brazilian coastal forests and severe trapping pressure; in spite of its extremely loud and unmusical call it is a popular cagebird, especially in Brazil. Occurs in a good number of protected areas. Principal threats to its habitat are urbanization, increased agricultural expansion and settlement, and associated road-building.
Bibliography. de Almeida & Teixeira (1996), Bertonatti (1997), Brooks *et al.* (1993), Canevari *et al.* (1991), Capper *et al.* (2000), Chebez (1994), Chebez *et al.* (1999), Collar *et al.* (1987), Cracraft (1985), Descourtilz (1983), Fraga & Narosky (1985), Guix (1995), Guix & Ruiz (2000), Guix *et al.* (1992), Hayes (1995), Hellmayr (1929), Lowen, Bartrina *et al.* (1996), Lowen, Clay *et al.* (1995), Mallet-Rodrigues & Marinho (2003), Mazar Barnett & Pearman (2001), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Navas & Bó (1988), Pacheco & Whitney (1995), Parker *et al.* (1996), de la Peña (1989), Pizo *et al.* (2002), Ridgely & Tudor (1994), Roda & Carlos (2003), do Rosário (1996), Saibene *et al.* (1996), Schürer & Bock (1995), Sick (1993, 1997), Snow, B.K. (1978), Snow, D.W. (1973a), Stattersfield & Capper (2000), Stotz *et al.* (1996), Teixeira *et al.* (1988), Tobias *et al.* (1993).



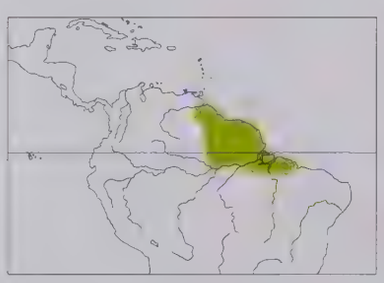
Genus *PHOENICIRCUS* Swainson, 1832

68. Guianan Red Cotinga

Phoenicircus carnifex

French: Cotinga ouette **German**: Blutkotinga **Spanish**: Cotinga Rojo Guayanés
Other common names: Red Cotinga (when merged with *P. nigricollis*)

Taxonomy. [*Lanius*] *Carnifex* Linnaeus, 1758, Surinam.
Relationships of genus uncertain, but apparently closest to *Rupicola*; further study required. Closely related to and forming a superspecies with *P. nigricollis*; could perhaps be considered conspecific, except for fact that ranges overlap in region of lower R Tapajós and perhaps between there and R Xingu. Monotypic.
Distribution. SE Venezuela (E Bolívar), the Guianas and lower Amazonian Brazil (E from E Roraima and Manaus area and, S of Amazon, from lower R Tapajós E to NW Maranhão).
Descriptive notes. Male 22 cm, 82 g; female 24 cm, 95 g. Distinctive; feathers of forehead directed forwards, half concealing nostrils, prominent bristly feathers around base of both mandibles, tarsus feathered on inner side, outer toe united with middle toe except for terminal phalanx. Male has crown (feathers glossy, plush-like), lower back to tail, and underparts from breast downwards bright red, rest of body blackish to maroon-brown, wings mostly rufescent brown, dusky on primaries, tail with dark brownish terminal bar; outer primaries highly modified, P6 normal in shape but short, P7 very short with attenuated, stiffened and twisted tip, P8-P10 somewhat stiffened, very narrow at base and broadest in middle, P10 very narrow at tip; iris red-brown; bill horn-coloured to brownish-orange; legs flesh-coloured. Female is larger than male in all measurements, is mostly olive, dull reddish on head and tail, rosy red from breast downwards. Immature male is like female, but with deeper red coloration, shorter wings. Voice. Male advertising call a 3-syllable "pee-chew-eet"; in aerial display, high-pitched whistle immediately preceded by whistling wing noise; monosyllabic "wheep" in arousal or alarm.
Habitat. Humid forest; to c. 600 m.



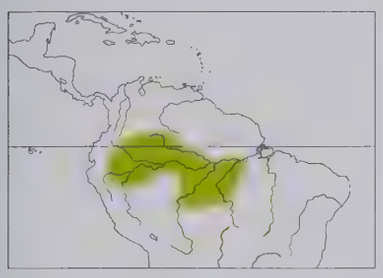
Food and Feeding. Apparently exclusively frugivorous; fruits from families Arecaceae, Lauraceae, Moraceae, Passifloraceae, Myrtaceae, Guttiferae, Melastomataceae and Euphorbiaceae recorded. Plucked either during aerial sally or from perched position.
Breeding. No information. Display period in Surinam Dec-May or, possibly, later. Male displays at lek, with several others (not necessarily in visual contact), calls noisily from perch c. 8-12 m up, leans slightly forward, wings drooped, tail lowered to expose brilliant red rump, frequently flies from one perch to another, alighting with swooping flight.
Movements. None recorded.
Status and Conservation. Not globally threatened. Rather rare and local throughout much of range, reasons for which not understood: locally fairly common in Guyana. Occurs in Imataca Forest Reserve and El Dorado, in Venezuela; almost certainly present in several other protected areas.
Bibliography. Blake (1950), Cohn-Haft *et al.* (1997), Haffer (1997b), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Meyer de Schauensee (1982), Oren & Parker (1997), Ridgely & Tudor (1994), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992), Trail & Donahue (1991), Zimmer *et al.* (1997).

69. Black-necked Red Cotinga

Phoenicircus nigricollis

French: Cotinga à col noir **German**: Samtkotinga **Spanish**: Cotinga Rojo Cuellinegro
Other common names: Red Cotinga (when merged with *P. carnifex*)

Taxonomy. *P[hoenicircus] nigricollis* Swainson, 1832, Rio Negro near Barcelos, Brazil.
Relationships of genus uncertain, but apparently closest to *Rupicola*; further study required. Closely related to and forming a superspecies with *P. carnifex*; could perhaps be considered conspecific, except for fact that ranges overlap in region of lower R Tapajós and perhaps between there and R Xingu. Monotypic.
Distribution. E Ecuador, NE Peru, SE Colombia, extreme S Venezuela (S Amazonas), and upper and middle Amazonian Brazil (E to lower R Negro and, S of Amazon, to lower and middle R Tapajós and R Curuá).



Descriptive notes. Male 22 cm, 93 g; female 24 cm. Distinctive; feathers of forehead directed forwards, half concealing nostrils, prominent bristly feathers around base of both mandibles, tarsus feathered on inner side, outer toe united with middle toe except for terminal phalanx. Male has crown (feathers glossy, plush-like), lower back to tail, and underparts from breast downwards brilliant red to rosy red, rest of body glossy blackish, tail with black terminal bar; outer primaries highly modified, P6 normal in shape but short, P7 very short with attenuated, stiffened and twisted tip, P8-P10 somewhat stiffened, very narrow at base and broadest in middle, P10 very narrow at tip; iris dark brown; bill yellow-ochre; legs pinkish-red. Female is larger than male in all measurements, is mostly olive above, dull reddish on head and tail, red below. Immature male is like female, but with deeper red coloration, shorter wings. Voice. Male advertising call a loud "whea", often preceded by soft "wur"; in flight display, abbreviated version of "whea" sometimes given, immediately preceded by whistling wing noise; monosyllabic "yip" in arousal or alarm.
Habitat. Humid forest; to 400 m.
Food and Feeding. Almost exclusively fruit, but few details; only identified fruits *Trichilia* (Meliaceae). Also arachnid remains in one stomach.
Breeding. No information. In NE Peru, male seen to display, with several others in auditory contact, from 3-5 favoured perches, often horizontal sections of lianas, in lower middle levels of forest; calls and bobs head, makes twisting display-flights.
Movements. None recorded.
Status and Conservation. Not globally threatened. Generally rare and local; recorded at only two localities in Venezuela. Known to occur in some protected areas, e.g. Amacayacu National Park, in Colombia, and Cuyabeno Reserve, in Ecuador. Persecution by some indigenous peoples, who covet the red feathers above those of all other species, may have led to reduction of numbers in E Ecuador. Localized distribution and small population apparently typical of both species of red cotinga, which remain poorly known.
Bibliography. Brooks *et al.* (1999), Cracraft (1985), Friedmann (1948), Haffer (1997b), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Oren & Parker (1997), Ortiz & Carrión (1991), Peres & Whittaker (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1993, 1997), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Trail & Donahue (1991), Whittaker (1996b), Willard *et al.* (1991), Zimmer *et al.* (1997).

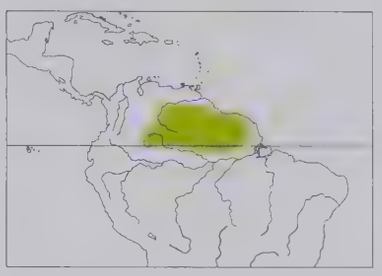
Genus *RUPICOLA* Brisson, 1760

70. Guianan Cock-of-the-rock

Rupicola rupicola

French: Coq-de-roche orange **Spanish**: Gallito de las Rocas Guayanés
German: Tiefland-Felsenhahn
Other common names: Orange Cock-of-the-rock

Taxonomy. [*Pipra*] *rupicola* Linnaeus, 1766, Cayenne.
Sometimes isolated with *R. peruvianus* in a separate family, Rupicolidae. Monotypic.
Distribution. E Colombia (locally SE Vichada S to Vaupés), S Venezuela (Amazonas, Bolívar), the Guianas, and locally N Brazil (from upper R Negro region E to Amapá, S to c. 100 km N of Manaus).
Descriptive notes. 27-32 cm; adult male average 218 g (2-year-old male 210 g, yearling male 200 g), female 203 g. Plumage unmistakable; bill strong, wide at base, becoming laterally compressed towards tip, rictal bristles absent, legs and feet strong, claws large and well hooked. Male has distinctive crest formed by two rows of flattened feathers, closely adpressed, ventral surfaces meeting along midline to form almost perfect semicircle; bright orange head and body, maroon subterminal line on crest; wings black with orange-buff to whitish margins, primaries with large white speculum; tail blackish with orange buff tips; secondaries very broad, inner ones with long silky fringes, feathers of back and uppertail-coverts similarly modified but to lesser extent; outer primary P10 with long slender tip, notched where tip joins expanded portion of inner vane; iris orange, yellower towards outside and sometimes on inner ring, sometimes red; bill yellow, base deep orange; legs yellowish-orange. Female is much duller than male, rather plain dark smoky grey, greyer on head (crest smaller than male's), somewhat bleached on outer webs of secondaries, belly buffier, crissum rufescent brown or ochraceous brown; iris paler and duller orange with greyer outer ring, bill blackish-horn with yellow tip and ridge of culmen, legs with dark brownish upper surfaces, dark horn on toes, and paler and yellower lower surfaces. Immature female is like adult; male at 1 year similar but freckled with orange, at 2 years mainly orange with small brown blotches, acquires full adult plumage at age of 3 years. Voice. Male calls at lek a variety of loud, raucous, crowing notes, usually uttered in confused chorus. Loud "waa-oww" during foraging.



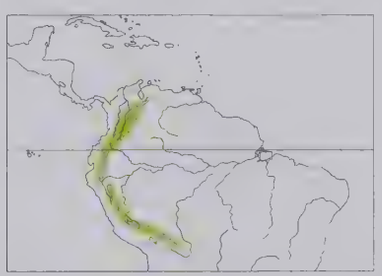
Habitat. Humid forest, mainly near rocky outcrops; to 2000 m, mostly below 1200 m.
Food and Feeding. Mainly fruit, usually plucked in flight; also large insects, small reptiles and frogs. Fruits of many tree families and genera recorded; Annonaceae, Arecaceae, Lauraceae, Burseraceae, Myristicaceae, Meliaceae and Araliaceae probably most important. Nestlings fed largely fruit, also small snakes, lizards, and insects.
Breeding. Only detailed study Surinam, where laying Jan-May. Male displays on ground at communal lek, up to 50 or more (usually fewer) males present, each with own "court" on forest floor (courts sometimes only 1-2 m apart) but spending much time in low branches of trees just above, defends surrounding perches, regular bouts of aggressive noisy display with neighbours; on arrival of one or more females in trees above, all males fly down to respective courts, crouch motionless and silent, plumage spread to form patch of brilliant orange fringed with silky filaments of rump feathers and secondaries, females move down to low perches above, inspect displaying males; female eventually descends to a court, landing behind male, may nibble at fringes of his rump and wing feathers, until eventually he hops around and mounts; in Surinam study, nearly all matings performed by small number of males that occupied central courts. Nest a solid bracket of mud and plant material, weight up to 900 g, fixed to vertical rock face, usually in crevice, cave or under overhang, sheltered from weather; saliva apparently used to cement the structure. Clutch 1-2 eggs, mostly 2 in first clutches, 1 in 50% of repeat clutches; incubation period average 28·5 days; fledging period 33-44 days. Nesting success evidently variable: 9% (2 out of 23) in one year, 32% (10 out of 31) in another.
Movements. No long-distance movements recorded. Female with young in nest, fitted with radio transmitter, did not move more than 400 m from nest.
Status and Conservation. Not globally threatened. CITES II. Fairly common, but local. Requirement of rocky outcrops limits its range, but most populations occur in remote, little-disturbed areas. Present in several protected areas, e.g. Canaíma National Park, in Venezuela, Iwokrama Forest Reserve, in Guyana, and Raleigh Falls-Voltzberg National Park, in Surinam.
Bibliography. Allen (1961), Blake (1950), Duce & Brannian (1990), Érard *et al.* (1989), Forrester (1993), Friedmann (1948), Gilliard (1941, 1962), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Iafrancesco *et al.* (1987), Meyer de Schauensee (1982), Novaes (1978a), Ridgely & Tudor (1994), Schuchmann (1984), Sick (1993, 1997), Snyder (1966), Storer (1995), Stotz *et al.* (1996), Théry & Larpin (1993), Thiollay (1988), Tostain *et al.* (1992), Trail (1984, 1985a, 1985b, 1985c, 1987), Trail & Adams (1989), Trail & Koutnik (1986), Wenny (2001), Willard *et al.* (1991).

71. Andean Cock-of-the-rock

Rupicola peruvianus

French: Coq-de-roche péruvien **Spanish**: Gallito de las Rocas Peruano
German: Andenfelsenhahn
Other common names: Red Cock-of-the-rock

Taxonomy. [*Pipra*] *peruviana* Latham, 1790, Chanchamayo, Junín, Peru.
Sometimes isolated with *R. rupicola* in a separate family, Rupicolidae. Four subspecies recognized.
Subspecies and Distribution.
R. p. sanguinolentus Gould, 1859 - W Andes of Colombia and NW Ecuador.
R. p. aequatorialis Taczanowski, 1889 - Andes of W Venezuela (NW Barinas, Táchira), C & E Andes of Colombia, and E slope in Ecuador and Peru (S to Amazonas and N San Martín).
R. p. peruvianus (Latham, 1790) - C Peru (S San Martín S to Junín).
R. p. saturatus Cabanis & Heine, 1859 - SE Peru and W Bolivia (La Paz, Cochabamba).



Descriptive notes. 30·5-32 cm; one male 266 g, female 213-226 g (*sanguinolentus*). Plumage unmistakable; bill strong, and wide at base, becoming laterally compressed towards tip, rictal bristles absent, legs and feet strong, claws large and well hooked. Male has distinctive crest formed by two rows of fluffy feathers, ventral surfaces of which meet along midline to form semicircular casque; bright orange head, body and majority of lesser upperwing-coverts; rest of upperwing and whole tail jet-black, except for grey tertials (with mostly concealed darker bases); inner secondaries very broad and square-ended; primary P10 with long slender tip, notched where tip joins expanded portion of inner vane; iris pale dull orange-pink with yellow inner ring; bill intense golden-yellow; legs yellow. Female is dark chestnut-brown, blacker on throat and wings, crest smaller than male's, eyes pale blue to whitish, bill blackish, legs grey. Immature female is like adult; immature male similar but more orange, bird bred in captivity acquired adult male plumage at 15 months (perhaps unnaturally early, owing to unnatural social environment), but some acquire

subadult plumage with body feathers olive-washed and modified secondaries not of fully adult type. Races vary mainly in depth and shade of pigmentation of male's plumage, extent of grey on inner secondaries, and eye colour, female varying in parallel: *sanguinolentus* male has body plumage blood-red, eyes deep red with yellow inner ring, female eyes light red with grey inner ring or pinkish grey-brown; *aequatorialis* is bright orange, somewhat variable, has grey of inner secondaries restricted, eyes bright yellow or orange-yellow with yellow inner ring, female eyes whitish to brown; *saturatus* is deep orange-red, eyes usually pale blue to whitish with pale orange-yellow inner ring, female eyes sometimes brown. Voice. Male call at lek a loud "youii", less raucous than that of *R. rupicola*, also a clucking, long-continued "kip-kip-kip". Foraging birds, of both sexes, may utter loud, querulous "uankk" when disturbed.

Habitat. Montane forest, especially in ravines and along streams; 500-2400 m.

Food and Feeding. Fruit, large insects, and small vertebrates. Fruits of many plant families and species recorded, those of Lauraceae, Annonaceae and Rubiaceae being especially important; fruits plucked mainly in flight. Small lizards and frogs form significant part of food brought to nestlings; these are beaten against branch, macerated in bill, and presented to nestling head first.

Breeding. Little exact information for most of range. Breeding mainly in Feb-Jul in S Colombia and laying in Aug in Ecuador and Bolivia, but probably not well synchronized in low-latitude populations; onset of moult (presumably post-breeding) in Oct-Jan S of 10° S, indicating breeding in second half of year. Male displays at communal lek with up to 15 or more others, each with perch 4-6 m above ground, males in pairs, each bird performing ritualized bowing and head-bobbing displays towards the other, with much jumping, wing-flapping, bill-snapping and calling; displaying intense when females approach. Nest a bracket-like structure generally in shape of truncated cone, mainly of mud, concave cup lined with coarse vegetable fibres, attached 3-12 m above ground to rock face, once under concrete bridge; often groups of nests relatively close together. Clutch 2 eggs; incubation period 28 days; fledging period 42 to at least 48 days.

Movements. No long-distance movements reported; individuals range some distance from restricted breeding habitat, presumably while foraging.

Status and Conservation. Not globally threatened. CITES II. Uncommon to locally common or fairly common; generally local or very local. Large lek exists near Cock-of-the-rock Lodge, in Peru. Occurs in several protected areas, e.g. Cueva de los Guácharos National Park, in Colombia, Podocarpus National Park, in Ecuador, and Machu Picchu Historical Sanctuary, in Peru. Preference for steep, thickly vegetated ravines and streamsides ensures little human disturbance. The "National Bird" of Peru.

Bibliography. Allen (1998), Benalcázar & Benalcázar (1984), Berry *et al.* (1982), Bloch *et al.* (1991), Briones (1991), Butler (1979), Chapman (1917c), Chapman (1921), Hellmayr (1929), Hilty (1985, 1997, 2003), Hilty & Brown (1986), Iafrancesco *et al.* (1987), Kendall & Kuehler (1989), Low (1980), Luy & Bigio (1994), Maillard & Caballero (2003), Negret (2001), Ortiz & Carrión (1991), Parker *et al.* (1985), Pérez & Pérez (1998), Perry *et al.* (1997), Quatro (2001), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg & Servat (2001), Schulenberg *et al.* (2001), Schuchmann *et al.* (1989), Snow (1971c), Storer (1995), Stotz *et al.* (1996), Williams & Tobias (1994), Zimmer (1930).

Class AVES

Order PASSERIFORMES

Suborder TYRANNI

Family PIPRIDAE (MANAKINS)



- Small arboreal birds of compact build, with short, rather wide bill, short wings and, except for males of a few species, short tail; feed mainly on small fruits, plucked in flight, and insects.
- 7-16·5 cm.



- Central and South America, and some offlying islands.
- Mainly tropical forest, a few species in scrubby woodland and thickets.
- 18 genera, 58 species, 146 taxa.
- 4 species threatened; none extinct since 1600.

Systematics

The classification of the Pipridae has long been controversial, and has still not been finally resolved. The long-standing and continuing difficulty has been that the "typical" manakins, consisting of 13 genera, form a well-defined group, while several other more or less manakin-like genera have characters that link them, variously, to the cotingas (Cotingidae) or the tyrant-flycatchers (Tyrannidae). The latter families are the two other main groups which, with the manakins, comprise the "tyrannoids", formerly combined in the superfamily Tyrannoidea. Although this taxon is now rarely employed, the three families are usually still kept together in a single suborder, the Tyranni, a useful grouping in this context.

P. L. Sclater, in 1888, separated the manakins from the two other related families on the basis of their "syndactylous" foot structure, in which the second phalanx of the outer toe is united with that of the middle toe, and on details of tarsal scutellation. This treatment was followed by R. Ridgway, in 1907. Later, however, it became apparent that too rigid an application of these criteria led to the probable misplacement of some genera. The syndactyly, for example, is shared with the cotingid genus *Rupicola*, and may originally have been an adaptation for perching on vertical stems. More recently, R. O. Prum has made a thorough reappraisal of manakin classification, based on extensive research into the structure of the syrinx and other anatomical, as well as behavioural, characters of the manakins and other tyrannoid genera. While it is clear that a number of changes very definitely need to be made to the traditional classification, there are several suggested ones for which the evidence is still somewhat uncertain, or even conflicting. Furthermore, it is likely that, within the near future, further research will throw new light on these and other controversial points. The classification currently adopted is therefore conservative, but incorporates the following generic changes, involving *Pipra*, the need for which seems incontestable.

Until recently, the genus *Pipra* was much the largest in the family, containing as many as 17 species. Such an arrangement has now been recognized as rendering the genus polyphyletic, and it has consequently been divided into three: *Pipra* and *Lepidothrix*, each with eight species, and *Dixiphia*, with a single species. In its syringeal anatomy *Lepidothrix* is much closer to the other manakin genera than to *Pipra*, from which it differs considerably in behaviour; its allocation to *Pipra* was based on the superficial similarity of the male plumage to that of others in the genus. *Dixiphia* is closer to *Pipra* but is not its nearest relative, and it, too, differs greatly in its behaviour. It is worth noting that *Teleonema*, a monotypic genus erected for the Wire-tailed Manakin (*Pipra filicauda*), has for some time been merged with *Pipra*, as this species, notwithstanding its extraordinary wire-like tail-feather projections (see Morphological Aspects), is a very close relative and allospecies of two typical *Pipra* species, the Crimson-hooded (*Pipra aureola*) and Band-tailed Manakins (*Pipra fasciicauda*).



Although most manakins form a well-defined group, there are a few notable outliers. The genus Schiffornis, *for example, is only distantly related to the true manakins, and its taxonomic affinities are hotly debated. Recent genetic work suggests that the* ***Thrush-like Mourner*** *belongs in a clade alongside* Tityra *and* Pachyramphus, *and recent morphological analysis identified a monophyletic grouping of six genera that are currently spread among the Tyrannidae, Cotingidae and Pipridae (including* Schiffornis*). It seems incontestable that the boundaries between these families are inaccurately drawn at present, and that major taxonomic upheavals lie ahead.*

[*Schiffornis turdina turdina*, Linhares, Espírito Santo, Brazil.
Photo: Edson Endrigo]



As its scientific name suggests, the ***Broad-billed Sapayoa*** *is a taxonomic riddle, with no obvious relatives in any family. It is wider-billed and longer-tailed than true manakins, and the recent discovery of its nest points to non-piprid origins. It builds a hanging pouch, and the young are attended by both parents, two characteristics unheard of in manakins, but common in tyrant-flycatchers. Meantime, it is retained in its traditional position until its origins can be confirmed.*

[*Sapayoa aenigma*, Ecuador. Photo: Doug Wechsler/ VIREO]

The five genera placed at the end of the family are all taxonomically controversial. They have traditionally been treated as piprid, following the criteria used by Sclater and Ridgway, but almost certainly they are only distantly related to the typical manakins. Since there is no overwhelming evidence for placing them elsewhere, however, they are retained here. *Schiffornis* is especially puzzling, as an analysis by Prum of 19 characters, mostly anatomical, suggested that it is a member of a monophyletic assemblage of six superficially very diverse genera currently divided among the Pipridae, the Cotingidae and the Tyrannidae. Furthermore, recent investigations by U. S. Johansson and colleagues, who analysed sequence data from two nuclear genes and one mitochondrial gene, resulted in *Schiffornis* grouping with *Pachyramphus* and *Tityra* in a tityrine clade, whereas *Pipra*, *Manacus* and *Chiroxiphia* were found to be monophyletic.

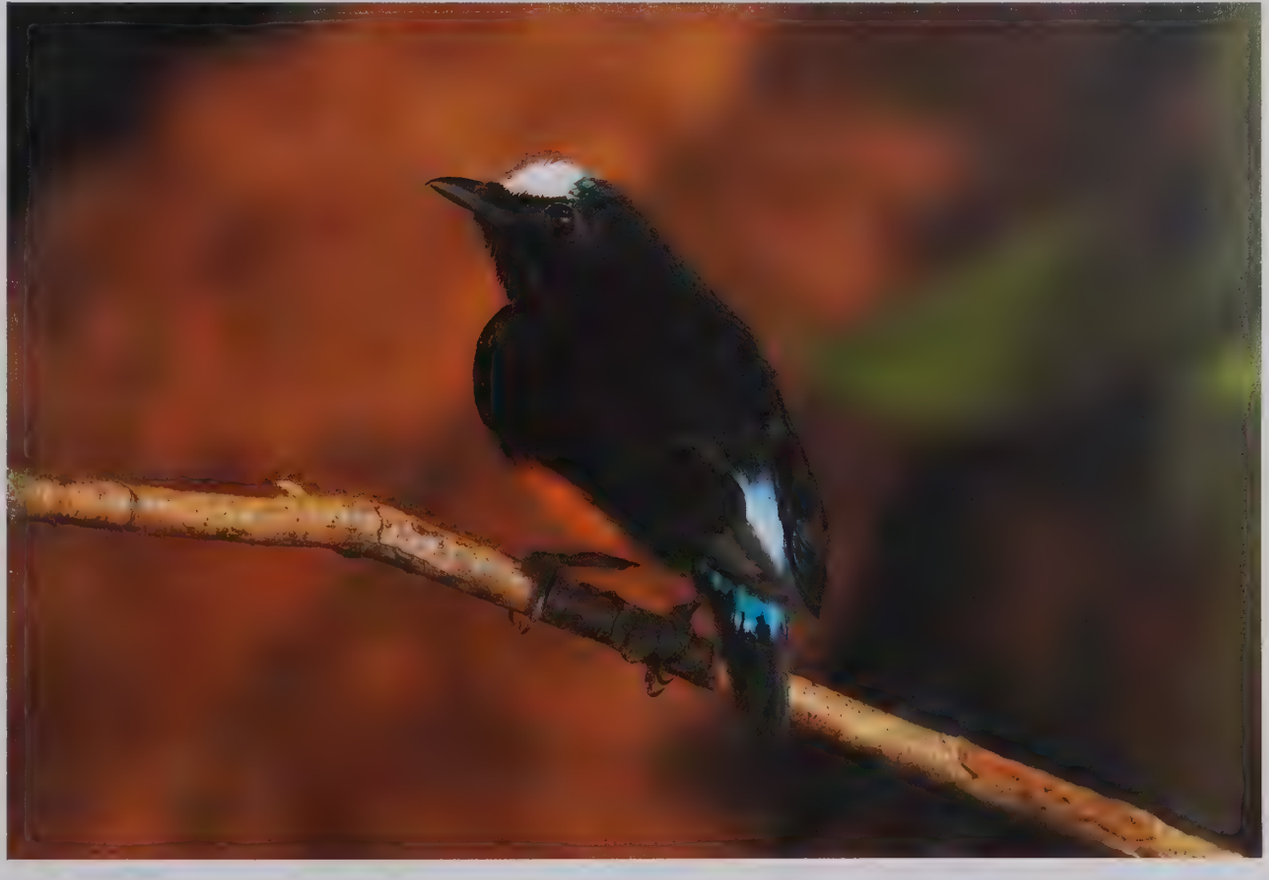
The genera *Piprites*, *Tyranneutes* and *Neopelma* also share with the cotingids and tyrannids some apparently derived character states, in other words, characters which have evolved later, rather than being ancestral to the tyrannoid stock. *Tyranneutes* and *Neopelma* may be closely related to each other. The monotypic genus *Sapayoa* contains the little-known Broad-billed Sapayoa (*Sapayoa aenigma*). It seems to be close to the tyrannids, and this likelihood has been strengthened by the recent discovery of its nest, which is pendent and pear-shaped, quite unlike a typical manakin's nest, and contained nestlings which were fed by both parents, indicating a social organization unlike that of a typical manakin.

At the species level, several taxonomic uncertainties remain. Further research may well indicate that, of the 58 piprid species currently recognized by most authorities, six should be split. These are the Blue-crowned (*Lepidothrix coronata*) and Blue-rumped Manakins (*Lepidothrix isidorei*), the White-crowned Manakin (*Dixiphia pipra*), the White-ruffed Manakin (*Corapipo leucorrhoa*), the Green Manakin (*Chloropipo holochlora*) and the Thrush-like Mourner (*Schiffornis turdina*). In most of these cases, the issue in question is that of whether lowland populations east and west of the Andes, presently treated as different subspecies, have diverged sufficiently to warrant the status of full species. Critical studies of voice, ecology and other aspects of their biology have not yet been undertaken, and any decision must necessarily be arbitrary. This is, of course, not a peculiarity of the manakin family; throughout the world, the same problem affects numerous closely related life forms with disjunct populations that have diverged to varying degrees.

A different and less usual situation complicates the taxonomy of the species of *Manacus*. Three of the four species in this genus come into contact with one another in Panama and Colombia, where they have produced narrow zones of hybridization. They could perhaps be considered to constitute a single species, as they differ mainly in the colour of the adult male plumage and are extremely similar in their courtship displays (see Breeding), as well as in their voice and ecology. On the other hand, the narrowness of the hybrid zones, and evidence

Until recently, Pipra *tended to be treated as by far the most species-rich genus in the family, with up to 17 species included. These were grouped together because of a superficial similarity in the colour and pattern of male plumage, but this arrangement has been shown to be polyphyletic. In particular, eight of the original 17 species, including the* ***Orange-bellied Manakin****, are closer to other manakin genera than to* Pipra *in terms of their syringeal anatomy. These same birds also differ in their courtship displays, and are thus removed to the genus* Lepidothrix. *Another unique form is placed in* Dixiphia, *leaving only eight species in* Pipra.

[*Lepidothrix suavissima*, Guyana. Photo: Doug Wechsler/ VIREO]

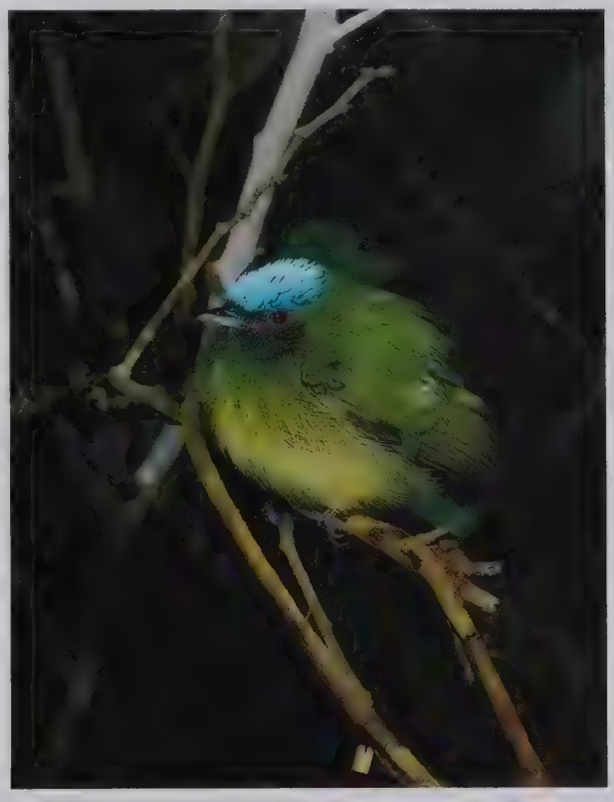






The typical manakins are small dumpy birds with stubby bills, short tails and large eyes. An almost universal feature is pronounced sexual dimorphism, males having relatively flashy and ornate plumage, and females being comparatively dull and greenish. This male ***Western Striped Manakin*** *is easily distinguished by his scarlet cap and red-streaked underparts, whereas the female (below) is relatively dowdy and anonymous, and is doubtless often passed over in the field without being identified. In most manakin genera, males are slightly heavier than females. The differences between the sexes can be explained by the breeding system prevalent in the family. While competition between males for the attention of females results in intense sexual selection for elaborate traits, there is no such competition between females and they have more to gain from camouflage.*

[*Machaeropterus striolatus*, Villavicencio, Colombia. Photos: Luis Mazariegos]



Young male manakins retain female-type plumage for one year at least. In their second moult a few male-type feathers often appear, resulting in intermediate plumage, for instance a green bird with a bright cap. In the ***Blue-crowned Manakin****, the adult male is usually black, so this might look like a youg male, but in fact it is an adult male of the race* caelestipileata*, in which males develop bright blue caps, but retain female-type body plumage throughout their lives. Green-bodied races occur south of the Amazon, black-bodied to the north. More than one species might be involved.*

[*Lepidothrix coronata caelestipileata*, 107 km west of Puerto Maldonado, Madre de Dios, Peru. Photo: Alan Greensmith/ Ardea]

that, at a lek within one such zone, males of the two hybridizing populations kept to separate ends, with hybrid males in the middle, indicate a degree of reproductive isolation warranting their treatment as separate species. This case is further complicated by recent evidence, based on protein analysis, which suggests that the yellow throat colour of the male Golden-collared Manakin (*Manacus vitellinus*) has spread into adjacent white-throated populations in north-west South America, and that white-throated White-bearded Manakin (*Manacus manacus*) populations west of the Andes are more closely related to the Golden-collared Manakin than they are to populations of the White-bearded Manakin living east of the Andes.

Morphological Aspects

Manakins are small birds, mostly in the weight range 8-30 g. They are arboreal, typically possessing a stout body and short tail, and a short bill which is broad at the gape and without rictal bristles. The outer toe is partly united with the middle toe.

Most of the typical manakins (see Systematics) exhibit a high degree of sexual dimorphism. Adult males of the majority of the species are largely black, with patches of brilliant colour, either pigment-based red, orange or yellow, or structural blue, opalescent or white, mainly on the crown or other parts of the upperside. Females and young birds are olive-green or green above and paler below, and in some cases they are so similar to other, co-existing species that they present problems of identification in the field. Adult males not only have patches of brilliant colour but, in many instances, also have highly modified wing or tail feathers, most or, probably, all of which are used in courtship display (see Breeding).

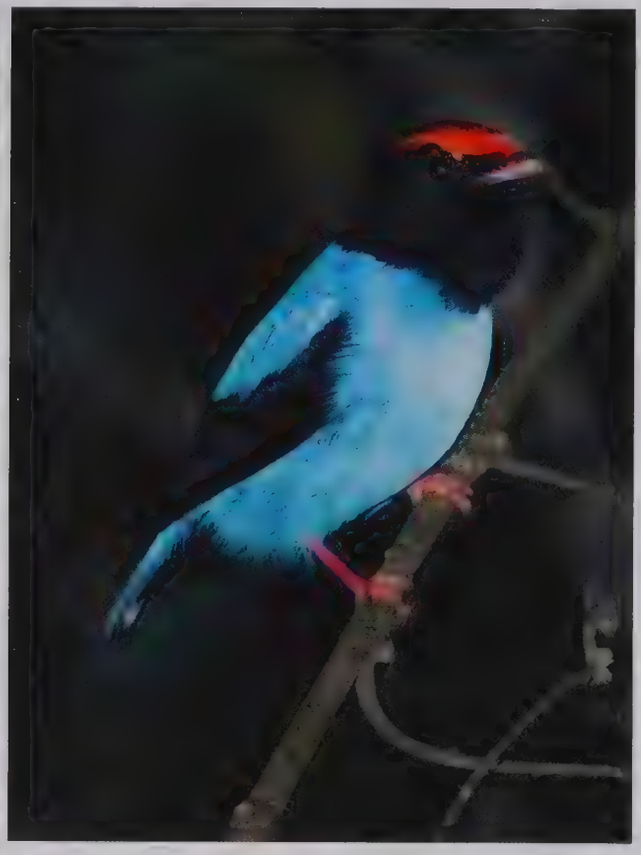
In the genus *Manacus*, the four outer primaries are very narrow, stiff and slightly curved, the outer webs being extremely narrow. Whenever the bird flies, and not just during display. these produce a grasshopper-like whirring sound. The secondaries are more highly modified, their shafts being unusually thick and the outer webs very stiff. As described later (see Voice, Breeding), these are involved in the production of the loud snaps that accompany courtship display. In several other species, in the genera *Pipra* and *Ilicura*, the secondaries are modified to a much lesser degree, the shafts being thicker and the vanes somewhat stiffer than in the unmodified condition. In these species, snapping sounds, less loud than those made by *Manacus* species, are a feature of the courtship displays, but the mechanism of sound production is quite different from that of *Manacus* (see Voice). Two of the eight *Pipra* species, the Golden-headed (*Pipra erythrocephala*) and Red-headed Manakins (*Pipra rubrocapilla*), lack the modification and make no snaps when displaying, although other elements of their display are quite similar to those of their most closely related congeners.



The genus Antilophia *contains two large species with unusually long tails and forward-pointing crests. Although* Antilophia *is divergent from* Chiroxiphia *in plumage, behaviour and voice, the two genera are almost certainly quite closely related, and hybrids have been recorded. Like its relatives in* Chiroxiphia*, the male* ***Helmeted Manakin*** *makes loud and insistent calls throughout much of the day. Unlike them, it appears to have no organized, co-ordinated display. This species shuns extensive forest, preferring instead the strips of gallery woodland and small forest islands in the* cerrado *region of central Brazil, easternmost Bolivia, and northernmost Paraguay.*

[*Antilophia galeata*, Rio Negro, Mato Grosso do Sul, Brazil. Photo: Haroldo Palo Jr]





The genus Chiroxiphia *is consists of five rather large species. The males are strikingly patterned in black, sky-blue and red, the* ***Blue Manakin*** *being much the most extensively blue. They pass through a series of age-specific subadult plumages for about three years, before attaining fully adult plumage. This delayed plumage maturation relates to a complex dominance hierarchy at leks. Females, by contrast, are dull, although a few older birds have orange-yellow foreheads, partly concealed by green mottling.*

[*Chiroxiphia caudata.*
Left: Rio de Janeiro, Brazil.
Photo: Luiz Claudio Marigo.

Right: Cantareira,
São Paulo, Brazil.
Photo: Edson Endrigo]

In males of *Machaeropterus*, the secondaries are extraordinarily modified in one species, the Club-winged Manakin (*Machaeropterus deliciosus*), and similarly so but to a far lesser extent in the other three species. The Club-winged Manakin's secondaries become progressively more curved from the outer end of the row inwards, the shafts becoming thickened distally, culminating at S6 and S7, which have the end of the shaft modified into a hollow, curved and pointed club. In display, male Club-winged Manakins raise the wings vertically above the back and vibrate their modified secondaries to produce a unique ringing sound.

Another extraordinary and unique modification, in this case of the tail feathers, is exhibited by the Wire-tailed Manakin, which for that reason was for long placed in a monotypic genus *Teleonema*. The shafts are prolonged into fine wire-like filaments curving inwards and downwards, those of the outermost feather pair being longest and the others progressively shorter. The filaments of the outer pair, if straightened, may be up to 50 mm in length, about half as long as the head and body combined. As described later (see Breeding), these tail filaments, which are rather inconspicuous, are used in display not for visual effect, but as tactile organs; they represent one of the very few such organs known in the avian world. It is of particular interest that two very closely related parapatric species, the Crimson-hooded Manakin and the Band-tailed Manakin, have unmodified tail feathers. The group may have differentiated in the Quaternary period, at a time when the Amazonian forest was reduced to a number of isolated refuges; if so, this is a striking example of the rapid evolution of a secondary sexual character.

Male manakins in the genus *Chiroxiphia* have the three outermost primaries pointed, the shafts being thickened and the barbs reduced. It is not clear in what way, if any, these feathers are used in display, but they may be aerodynamically important in the fluttering jump and hover which is the most significant element in the uniquely complex courtship display of this genus. In three of the five species the central tail feathers are elongated to different extents, most extremely so in the Long-tailed Manakin (*Chiroxiphia linearis*). This, too, appears to be a case of rapid evolution, as four of the species, at least, are certainly very closely related. It is curious that only in the Long-tailed Manakin does the elongation seem great enough to enhance the visual effect of the courtship displays, which are very similar among all five species.

Turning to other aspects related to morphology, the relative sizes of the sexes, based on body mass, or weight, vary according to the genus involved. In most genera, males are slightly heavier than females, except during the latter's egg-laying period. Conversely, in *Pipra*, *Lepidothrix*, *Dixiphia*, *Corapipo* and, probably, *Masius*, it is the females that are the heavier, most markedly so in the case of the White-crowned Manakin, of which a large sample of both sexes in French Guiana showed the aver-



The male ***Pin-tailed Manakin*** *shows several unusual features, including a scarlet rump and frontlet, a pale iris, and lengthened tail feathers. Although this last feature is not unique within the family, occurring in more than one* Chiroxiphia *taxon, the species has no obvious close relative, and as such is placed in a monotypic genus. On behavioural evidence it might be most closely related to* Masius *and* Corapipo, *although the slightly stiffened and thick-shafted secondaries are reminiscent of* Manacus. *These feathers are used for producing similar, but quieter, snapping sounds in display.*

[*Ilicura militaris.*
Photo: John S. Dunning/
Ardea]





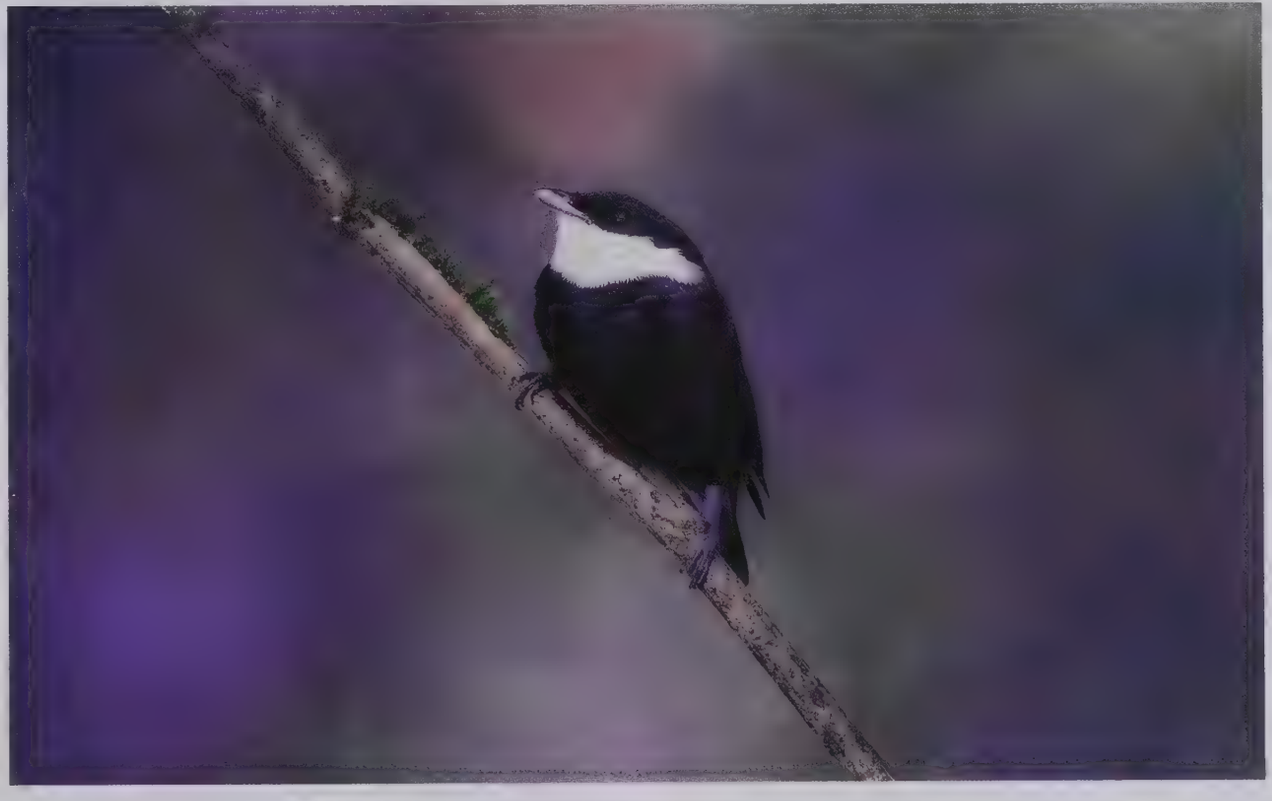
The genus Masius *contains a single species, the* ***Golden-winged Manakin****. The male looks mostly black when perched but golden-yellow when it takes to the air. The colourful flashes in the wings and tail are conspicuous during display flights, which are centred on a mossy log in on the forest floor. Another feature unique to this genus is the scale-like feathering of the rear crown, visible in the left-hand photograph. This species is one of few manakins that are confined to subtropical woodland, occurring at quite high altitudes in the Andes.*

[*Masius chrysopterus coronulatus*, Ñambí River, Colombia. Photos: Luis Mazariegos]

age weight of males to be 86% of that of females. In these five genera, displaying males execute rapid and complex flight manoeuvres. Owing to the modifications of the flight-feathers of the adult males of some piprid genera, the standard wing measurement is not a reliable measure of overall size.

In common with most other passerines, adult manakins undergo a complete moult immediately after breeding. Prior to that, the young birds first acquire a female-like juvenile plumage. Their subsequent plumage changes are not well known, and only those of the White-bearded Manakin and the Golden-headed Manakin have been studied in some detail. In these two cases, the juvenile plumage is replaced after a few months in an apparently prolonged moult of the head, body and wing-coverts, resulting in a plumage still of female type in both sexes, except that young males often acquire a few new feathers of adult male colour. At the next moult, which is complete and begins when the birds are a little over a year old, males acquire fully adult plumage.

The time taken by young males to gain the full adult plumage, with the concomitant structural feather modifications, varies according to species. As mentioned above, young male



The genus Corapipo *contains two species that are confined to Central America and northernmost South America. Males of both are glossy blue-black with a prominent snowy-white throat. The genus shares with* Heterocercus *and* Tyranneutes *a spectacular element of courtship display. A male* ***White-ruffed Manakin****, for example, flies up in steep spirals until he clears the topmost branches of trees, hovers momentarily, then plummets back to a display log far below on the forest floor. Indeed, while both* Corapipo *species live mainly in dark undergrowth, they are amongst the few manakins that spend any time above the rainforest canopy.*

[*Corapipo leucorrhoa altera*, Cerro Pirre, Panama. Photo: Luis Mazariegos]



The genus Manacus *contains four common species. These ball-like birds are small, neat and dumpy, with orange legs. The males are boldly patterned, like this* ***Orange-collared Manakin****, with a black cap, wings and tail, and either white or some intense colour on the collar, throat and belly. They have characteristic, lengthened throat feathers. In addition, their primaries are narrow, stiff and slightly curved; the shafts of their secondaries are unusually thick, and the outer webs are stiffened. This unusual wing feather design creates a whirring sound in flight, and is used to produce mechanical noises in display.*

[*Manacus aurantiacus*, Carara Biological Reserve, Costa Rica. Photo: Michael Gore/FLPA]

White-bearded and Golden-headed Manakins moult into adult plumage at the beginning of their second year of life, the moult commencing a little earlier in the season than that of the breeding adults. At the other extreme, males of the Long-tailed Manakin pass through three distinct, age-specific subadult plumages and do not acquire fully adult plumage until their fourth year. This delayed plumage maturation is related to the complex dominance system obtaining at *Chiroxiphia* leks (see Breeding), each subadult plumage stage apparently serving as a "badge of status" within a group of males of different ages.

For many manakin species, details of plumage sequences are not well known. Indeed, only for a small number of species is significant information available.

Habitat

The manakins are almost exclusively birds of tropical forest, living mainly in lowlands below about 1000 m. A few species are found at subtropical levels in the Andes, a notable example being the Golden-winged Manakin (*Masius chrysopterus*); none ascends as high as temperate levels, where several of their relatives, the cotingas, and many species of tyrant-flycatcher occur. Piprids live almost entirely in the lower and middle strata of the forest, rarely moving up into the high canopy.

Whereas some manakins, such as the *Lepidothrix* species, are rather strictly confined to humid primary forest or mature second-growth forest, others are tolerant of, or even prefer, more disturbed or more open woodland. Thus, the members of the genus *Manacus* prefer forest-edge habitats, quite recent second-growth woodland, and similar kinds of vegetation where there is an abundance of more or less closely spaced saplings with vertical stems, suitable for their leks (see Breeding). Many species, living mainly in the forest interior, come regularly to feed at fruiting trees at the forest edge. This is, in fact, much the easiest place for the casual observer to see them, as some of their most important sources of small fruits, especially small trees in the families Melastomataceae and Rubiaceae (see Food and Feeding), tend to be in greatest abundance along forest edges.

A general requirement for all typical manakins is the availability of a year-round supply of small fruits. Most humid forests in the Neotropics meet this requirement, and well-grown secondary forest, which, like forest edge, tends to be rich in suitable berry-bearing trees, can hold especially high populations of *Pipra* and *Manacus* species.

Within the forest, the display sites of the different manakin species, at and around which the males spend most of their time (see General Habits), are far from randomly distributed. Much of what is known about this aspect of habitat selection by manakins



The genus Machaeropterus *contains four rather aberrant manakins. Males are characterized by brownish plumage, a red or yellow cap, and bold streaking. Their vocalizations are also odd, usually brief buzzy rattles or very high-pitched frog-like notes. The secondaries are stiffened and modified in various ways, a feature taken to its extreme in the most divergent of the quartet, the* ***Club-winged Manakin****. In this montane species, the ends of the secondary shafts are hollow, curved and thickened into point-tipped clubs. In display, the wings are raised above the back and these feathers are vibrated to produce a unique ringing sound.*

[*Machaeropterus deliciosus*, La Planada Nature Reserve, Colombia. Photo: Luis Mazariegos]



*The **Black Manakin**, the sole member of the genus* Xenopipo, *looks somewhat out of place in the manakin family. It is longer-tailed than most of its relatives, and the male is unremittingly black, with no patch of colour. Indeed, its plumage and pale bill are reminiscent of male black-tyrants* Knipolegus. *Added to this, it catches insects on the wing, follows mixed-species flocks and has no conspicuous display. Its posture and large eyes are manakin-like, however, as are its vocalizations. In general, it is patchily distributed and difficult to find, though it can be fairly common in its favoured habitat of low-stature scrubby woodland, especially where this occurs on white-sand soils.*

[*Xenopipo atronitens*, Jeberos, Bajo Huallaga, Loreto, Peru. Photo: José Álvarez Alonso]

comes from studies carried out by M. Théry in French Guiana. Here, the leks of White-bearded Manakins and the display-logs of White-throated Manakins (*Corapipo gutturalis*) were in sites, such as east-facing slopes, which received sunlight at the two times of day when display activity is at its height, namely, the early morning and the afternoon. Similarly, the much higher display-perches of Golden-headed Manakins, 5-15 m above ground, were sited so as to be illuminated through gaps in the canopy to the east and west. The display sites of White-fronted Manakins (*Lepidothrix serena*), near the ground in the densest patches of forest, were nevertheless situated in places where there was most light, the males regularly alternating between a morning site and an afternoon site, each best illuminated at those times of day.

Recent studies being undertaken in southern Venezuela have corroborated these findings. Observations on four piprid species living in forest bordering the upper River Orinoco, in Amazonas, confirmed that the males, for their leks, selected positions along the vertical gradient where ambient light increased chromatic and/or achromatic contrast of their colour signals against the background or within their coloration patterns.

As mentioned above, the *Manacus* species prefer forest edge and secondary woodland to the interior of primary forest. Some other piprids, most notably those in the genus *Chiroxiphia*, occur, at least locally, in more open and drier types of woodland; the Lance-tailed Manakin (*Chiroxiphia lanceolata*), for instance, lives mainly in thick scrub and the lower growth of rather dry woodland. At the other extreme, the closely related Crimson-hooded, Band-tailed and Wire-tailed Manakins are found mainly in seasonally flooded *várzea* forest or in drier forest along watercourses. The three *Heterocercus* manakins also show a strong preference for seasonally flooded forest.

Two manakins occur in habitats which are atypical for the family. The Helmeted Manakin (*Antilophia galeata*) inhabits gallery woodland in the *cerrado* region of central Brazil, and the Black Manakin (*Xenopipo atronitens*) lives in patches of scrubby woodland and gallery forest in mainly unforested areas of the Amazon Basin. Both of these species are "true" manakins (see Systematics), and one of them, the Helmeted Manakin, is apparently quite closely related to *Chiroxiphia*. It is noteworthy, therefore, that they have not developed, or perhaps have lost, the elaborate courtship displays of their forest-living relatives and appear, instead, to have a more conventional social organization, although this aspect of their life is not well known.



The genus Heterocercus *amounts to a superspecies of three taxa, all of which have rather graduated tails. This feature is unique in the entire suborder Tyranni. In each member of the trio, males have bright crowns, and silky white elongated throat feathers. Like its congeners, and despite its Amazonian range, the **Orange-crested Manakin** is more a bird of* várzea *and low-stature woodland than of rainforest. Its remarkable display involves a spiral ascent until the bird is 60-100 m above the forest canopy, then a headlong plummet at high speed back to the understorey. During this rapid descent, the wings produce a hissing sound, and a loud pop.*

[*Heterocercus aurantiivertex*, upper River Tigre, Loreto, Peru. Photo: José Álvarez Alonso]

General Habits

Typical manakins share a combination of habits that marks them out from other Neotropical forest birds. Almost all of their move-



Five unassuming species occupy the genus Neopelma. *They are characterized by dull plumage in both sexes, and slightly longer tails and bills than is usual for the family. They are highly inconspicuous, and often ignored as unidentifiable tyrant-flycatchers (which they may well be!). Indeed, were it not for their distinctive voices, they would often go unnoticed. Until recently, only one species of* Neopelma *was thought to live in south-east Brazil, but vocal analysis revealed two song types. As a result, the* ***Serra Tyrant-manakin*** *was split from Wied's Tyrant-manakin* (Neopelma aurifrons), *which is otherwise extremely similar.*

[*Neopelma chrysolophum*, Intervales, São Paulo, Brazil.
Photo: Edson Endrigo]

ments, facilitated by the small size of the species, are quick and abrupt. When foraging, they do not hop about among branches or foliage, but perch motionless and make sudden aerial sallies. When displaying, they perform very rapid, often complex flights. Their actions when perched consist either of rapid "about-faces", so sudden that the foot movements are hard to see, or apparent "slides" along the perch, either sideways or backwards, by means of very fast, short steps, again too rapid to be followed by the unaided eye. Adult males spend a great part of their lives in more or less elaborate advertising display at fixed sites, either singly or in groups, and females undertake single-handedly all nesting and young-rearing duties (see Breeding).

The members of this family are generally unsociable when foraging and feeding, but some piprids do at times accompany mixed-species foraging flocks. Not uncommonly, however, several individuals may be found together at a fruiting tree, independently attracted by the same food source.

Manakins bathe communally in forest streams in the late afternoon, mainly between 16:00 and 17:30 hours. In his detailed study in French Guiana, Théry found that four species, the Golden-headed, White-crowned, White-fronted and White-throated Manakins, regularly bathed together, whereas the White-bearded Manakin bathed separately. Individuals took turns to bathe, the others perching a few metres away. Evidently, it is important to keep a keen lookout, as predators such as forest-falcons (*Micrastur*) and snakes were seen near bathing sites, and a bathing tanager (Thraupidae) was observed to be taken by a snake.

Roosting takes place on slender perches in the lower levels of the forest. Théry found that, in the breeding season, the roost-sites of adult males were always outside their display areas, and generally near a main feeding area. Two males with neighbouring display sites might sleep less than 5 m apart. Females roosted in different areas, either alone or with a dependent juvenile on the same branch.

It is, however, for their courtship displays that the manakins are famous. These displays involve the most elaborate and complex movements, and interactions between individuals, that are known among passerine birds. A main feature of the displays of many manakin species is that the males perform in groups, or "leks", which persist in the same place from year to year. Moreover, an adult male manakin's entire life, with the exception of the period of the annual moult (see Morphological Habits), is centred on the lek, at which he may, furthermore, be present for up to 90% of the daylight hours (see Movements), with brief absences for foraging. This is typical of, for example, the Golden-headed Manakin. Observations in Trinidad, where this species is numerous, reveal that the males may perch inactively for long periods, frequently emitting brief calls; at times they peck at excrescences on their perches, and, if there are leaves or vine tendrils hanging nearby, they habitually pull at these while hovering, thus keeping the area immediately around the perch clear of obstruction.

A highly complex social organization has been found to exist at these display arenas, where the males compete with one



The genus Tyranneutes *is probably only distantly related to the typical manakins. Two tiny, sexually monomorphic species are involved, one of which, the* ***Dwarf Tyrant-manakin****, is amongst the commonest birds in Amazonia. Despite this, it is rarely seen until its voice is recognized. Single males give their simple two-note song from static traditional sites, evenly spaced in the lower middle storey. This song can be heard throughout the day, and during all seasons.*

[*Tyranneutes stolzmanni*, Peru.
Photo: Ketil Knudsen]



Members of the genus Schiffornis *resemble typical manakins in their general form. They differ dramatically, however, in their loud and musical whistled vocalizations, pair-living social structure, dull monomorphic plumage, and nest architecture, factors suggesting that their true affinities lie elsewhere. This impression is emphasized by their size (bigger than most manakins) and their colour, which tends towards brown rather than green or yellow. Despite its name, the* ***Greenish Mourner*** *is quite rufescent, especially on the wings and tail. Like others in the genus, it is difficult to see, but easy to hear, and is often caught in mist-nets.*

[*Schiffornis virescens*, Serra da Cantareira, São Paulo, Brazil. Photo: Edson Endrigo]

another for the females, which visit the leks to mate. Nevertheless, displays are also performed intermittently when no female is present. As this intriguing behaviour is so closely associated with reproduction, however, it is discussed in greater detail in that context (see Breeding).

Voice

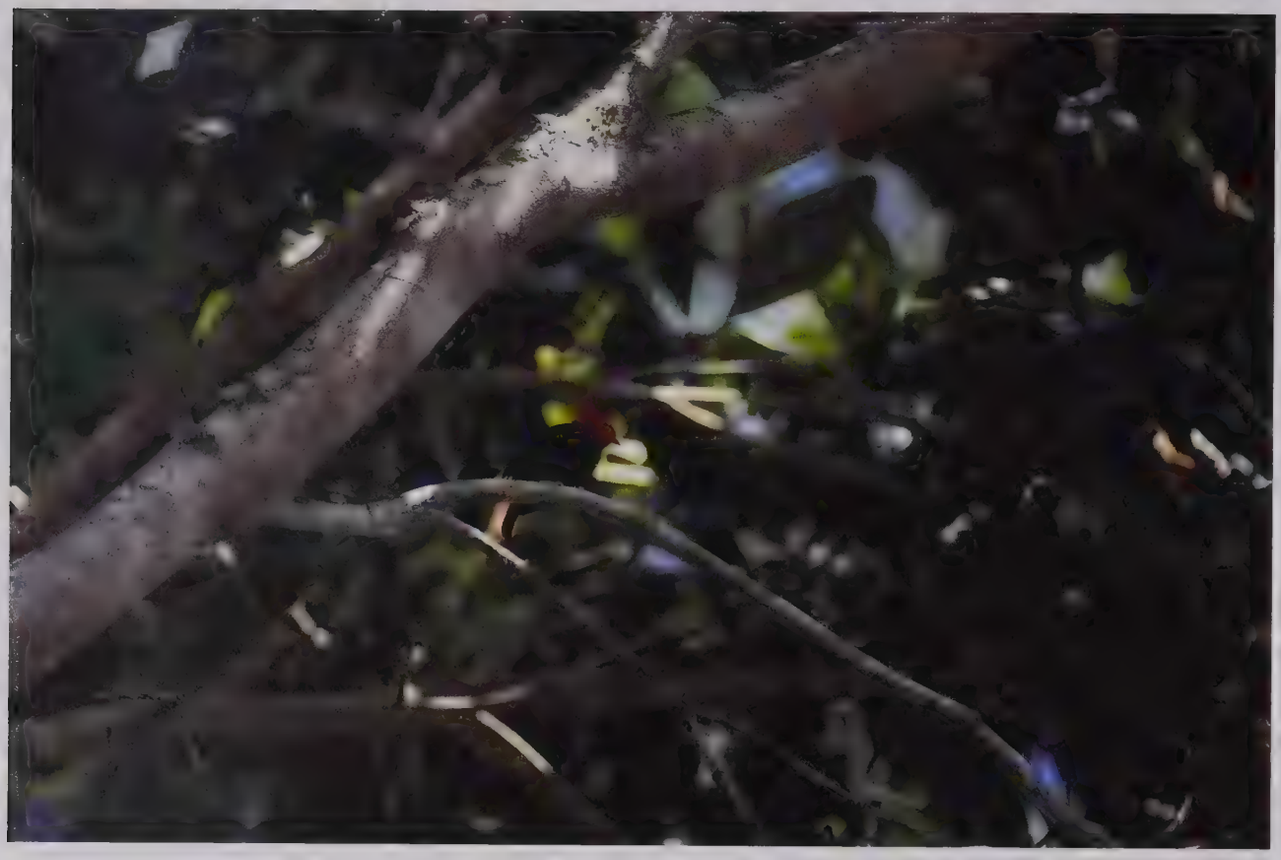
Manakins are generally rather silent birds, except at their display grounds. There, in association with their displays (see Breeding), the males utter a variety of mainly simple but often strange or striking calls. In addition, many species produce mechanical sounds, either in flight or when perched; the wing feathers and associated musculature of some piprids are specially modified to this end (see Morphological Aspects). These mechanical sounds are functionally equivalent to vocal sounds. Indeed, because of the rapidity of the bird's movements, it is in some cases by no means obvious to the observer whether a particular sound is vocal or mechanical. Furthermore, even when it is obviously mechanical, it is usually impossible to determine with the naked eye exactly how the sound is made. The following account is not exhaustive, but aims to give some idea of the range of sounds produced by manakins, and the contexts in which they are made.

Males of all of the well-studied piprids with fixed, often traditional, display territories or "courts", namely the typical manakins (see Systematics), have special advertising calls which they utter more or less regularly when at the display site. Away from the display area, both sexes are generally silent. These

The ***Wing-barred Piprites*** *is typical of its genus but unusual amongst manakins in being a canopy dweller and a flock follower. Territorial males produce distinctive songs, and never perform displays or gather in leks. The only nest found to date was extraordinary within the context of the Pipridae in being sited in a cavity and lacking any form of suspended structure. The genus as a whole seems only weakly allied to true manakins, and it might have stronger ties to the Tyrannidae or Cotingidae.*

[*Piprites chloris chloris*, Intervales, São Paulo, Brazil. Photo: Edson Endrigo]





*The **Scarlet-horned Manakin** resides in tall forests, a habitat occupied by the vast majority of its relatives. Highest piprid diversity is found in primary forests of the humid lowlands, but many species occur elsewhere. Some tolerate, or even prefer, secondary vegetation. A few are found in dry forests, gallery woodland or the temperate zone. Manakins are essentially birds of lower or middle strata, although within these general constraints there is some niche segregation.* Pipra *species, for example, tend to travel in the middle storey, and* Manacus *in the understorey.*

[*Pipra cornuta*, SE Venezuela. Photo: Roland Seitre]

advertising calls, unlike those of many of the related cotingas, are mostly not very loud or far-carrying; they may be monosyllabic or they may be more complex, for instance a rapid phrase of a few notes, or a trill. Some are curiously unlike any "normal" sound expected from a bird. Thus, the male Golden-winged Manakin utters, at intervals that can be as short as 5-6 seconds but are usually rather longer, a low-pitched frog-like "nurrt", which is audible for only a short distance. This note seems to be designed to make any conspecific which may be in the near vicinity aware that he is in his display territory. Male Pin-tailed Manakins (*Ilicura militaris*) advertise their presence by emitting a soft, regularly repeated "see-see-see", usually of 5-8 notes, ending faintly and sounding plaintive to the human ear. In both of these species, males occupy display areas well separated from those of their fellows, and they can easily be overlooked by a human observer who is unacquainted with their voices. The lek-displaying *Pipra* and *Manacus* species, by contrast, have louder, more incisive advertising calls which are mutually stimulating, so that they tend to be given in bursts interspersed with more silent periods.

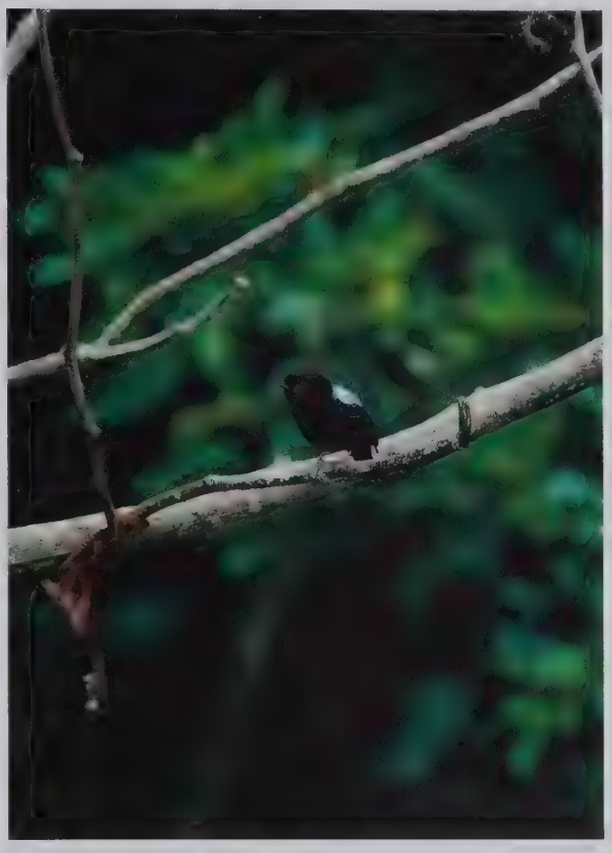


*The **Varzea Mourner** earns part of its English name from its specialized habitat requirements. It is widespread in Amazonia, where it is strictly tied to seasonally flooded forest, or* várzea. *This forest type is found along low-lying river margins and in the curved depressions formed by old ox-bow lakes. It tends to be much lower in stature than* terra firme *forest, and usually more tangled. The Varzea Mourner would be difficult to see in this dense swampy habitat were it not for its loud, distinctive song, and its aggressive response to playback.*

[*Schiffornis major major*, Anavilhanas, Amazonas, Brazil. Photo: Arthur Grosset]

The loudest advertising calls are given by the blue-backed *Chiroxiphia* species, notable for their co-operative courtship displays (see Breeding). Those of the four best-known species are strikingly different from one another. In the case of the Blue-backed Manakin (*Chiroxiphia pareola*), the dominant male of a group uses a single, incisive "chup", preceded by a rolling "wrrrr", to call up a subordinate male, which perches close beside him. The two then commence a duet of almost perfectly synchronized phrases, usually with 2-4 notes per phrase, "chup-chup, chup-chup-chup" and so on, the dominant male beginning each note about 0·04-0·06 seconds before the subordinate male. The very small time difference between the two birds gives the duet a curious quality, which has been aptly described as "a resounding phrase that rang through the forest like the clicking of billiard balls". In contrast, the duets of the Long-tailed and Lance-tailed Manakins, which replace the Blue-backed in Central America and northern South America, are musical and almost flute-like, and the intervals between the utterances of the two birds are longer. From the resulting medley of pure whistled phrases, these two species have earned the local name of *toledo*. The fourth of the well-known species in the genus, the Blue Manakin (*Chiroxiphia caudata*) from eastern South America, is different again; its duetting calls, irregularly overlapping, consist of phrases of sharply ascending and descending pitch, and sound to the human ear like a confused gabbling.

Quite different from the calls of the typical manakins, in both their form and the context in which they are given, are the calls of the three mourners in the genus *Schiffornis*, included



Long considered a montane race of the Blue-backed Manakin (Chiroxiphia pareola), *the* ***Yungas Manakin*** *inhabits subtropical forests in south Peru and Bolivia. It prefers cloudforest at moderate altitudes in the Andean foothills, but it has been recorded up to 2200 m. Like most* Chiroxiphia *manakins, the males are noisy but surprisingly difficult to see. This is a common bird, especially in Bolivia, where it is almost constantly audible in suitable habitat, even in small forest patches, or in narrow strips of bushy forest along streams in otherwise open country.*

[*Chiroxiphia boliviana*, Manu National Park and Biosphere Reserve, Peru. Photo: Bernard van Elegem]

within the Pipridae more for convenience than for any other reason (see Systematics). Far more easily heard than seen, the inconspicuously coloured males, as they move through the forest undergrowth while foraging, give a pure whistled phrase of several notes and characteristic rhythm at irregular, usually rather long intervals. The function of this vocalization is presumably that of advertising possession of a territory to neighbouring males, and the caller's position to interested females.

The closely related *Manacus* species are outstanding for the loudness of some of the mechanical sounds that accompany their displays. The main sound is a loud snap, produced at the moment when a bird takes off from a vertical stem bordering one side of its court, to land on another on the opposite side. It had been thought that the snap was caused by the modified secondaries brushing very rapidly against one another, but recent research by K. Bostwick and Prum, using high-speed video recording, has shown that the sound is made by the dorsal surfaces of the wings being clapped together above the back in a movement of extreme rapidity, apparently meeting one another at or near the swollen bases of the secondaries. This is made possible by an enlargement and modification of the muscles that raise the wing. A different form of the snap, the "roll-snap", is produced, much less frequently, by a perched individual; as it is made, the wings can be seen momentarily to be raised above the back.

Some other manakin species, when displaying, make a snap or less loud clicks. Only one such species, the Red-capped Manakin (*Pipra mentalis*), has been studied by means of high-speed video recording, and this has produced some remarkable findings. The display of the male Red-capped Manakin features three kinds of sound of this type, brief broad-frequency sounds with a very sharp beginning, and all three of them are produced in different ways, differing also from the mechanism used in the *Manacus* snap. One is produced by the wings alone, another by brushing the tips of the primaries very rapidly against the raised and fanned tail, and the third by striking the ventral surface of the wing against the side of the body and the thigh.

The extraordinarily modified secondaries of the adult male Club-winged Manakin are apparently responsible for the second part of a double mechanical sound, "tip-beeuwww", produced by displaying birds. For the "tip" the wings are flicked downwards, and for the "beeuwww", like the sound of a miniature trumpet, they are held up vertically above the back and vibrated, the expanded club-like endings of the middle secondaries presumably acting as resonators and producing harmonics that are apparently unique among avian mechanical sounds. Displaying males of the related Eastern Striped Manakin (*Machaeropterus regulus*), having less extreme club-like endings of the secondaries, make a resonant grasshopper-like whirring as they cling head downwards on a vertical perch, turning from side to side so rapidly as to become a blur. In the Western Striped Manakin (*Machaeropterus striolatus*) and the Fiery-capped Manakin (*Machaeropterus pyrocephalus*), but not the congeneric Club-winged Manakin, the shafts of the tail feathers are thickened and are probably used for mechanical sound production. It is significant that in the genus *Machaeropterus*, with these extreme specializations for mechanical sound, the syringeal muscles are reduced in comparison with those of other manakins. In particular, the Club-winged Manakin, the most specialized of all, has almost no syringeal musculature, and in its courtship display makes only two simple vocal sounds. The advertising call common to most other manakins has been replaced in this species by the mechanical trumpet sound.

Several members of the Pipridae produce mechanical sounds during a rapid, stereotyped fly-in to the display perch. The three members of the "*Pipra aureola* group", consisting of the Crimson-hooded, Band-tailed and Wire-tailed Manakins, make a soft "kloop", apparently with the wings, at the lowest point of the flight before swooping up and landing on the perch. Similarly, the White-throated Manakin produces a muffled "pop" at the moment of stalling in mid-air, with a flash of his white wing patches, just before alighting on his display-log. As described later (see Breeding), the Orange-crested Manakin (*Heterocercus aurantiivertex*), after a spiral ascent high above the forest canopy, makes a loud hissing sound as it plummets vertically downwards at high speed; again, it is thought that this extraordinary sound is made with the wings.

It is likely that further research employing high-speed video recording will reveal equally amazing methods of sound production in manakin genera that have so far been studied only by means of field observation and sound recording. It is probable

A few manakins are associated with drier forest or marginal habitats rather than intact humid forest. The tyrant-manakins in the genus Neopelma, *for example, tend to live in riverine growth, dense secondary vegetation, gallery woodland, bamboo or fern forest. The* ***Saffron-crested Tyrant-manakin****, pictured here, is a bird of forest islands in savanna regions, and of scrubby habitat where thin-stemmed brushwood is prevalent. It shuns humid forests, but is relatively common in low-stature woodland, especially where this stands on white-sand soils.*

[*Neopelma chrysocephalum*, Allpahuayo-Mishana Reserved Zone, Loreto, Peru. Photo: José Álvarez Alonso]





Most manakins are birds of the dark understorey and apparently never sun-bathe. Likewise, dust-bathing has not been reported for any member of the family. As with most birds, their chief comfort behaviour is preening, a habit they indulge in with a fair degree of enthusiasm, as these photographs testify. They show a ***Green Manakin****, perhaps a male, stretching its wings, nibbling the wing-coverts, and drawing its bill along the primaries to neaten the arrangement of barbs and barbules. Away from leks, manakins are relatively solitary birds, and no allopreening has ever been recorded. The genus* Chloropipo*, in which the Green Manakin resides, contains four inconspicuous species, each with a slightly longer tail than in typical manakins. Not only is the dull plumage of males identical to that of females, but these species seem remarkably quiet for a manakin: only modest vocalizations have been heard and no display has been recorded. There is evidence that* Chloropipo *is allied to* Xenopipo*, and it has even been suggested that the former should be subsumed within the latter. The traditional separation of these genera is maintained here, in part because the loud voice and wide repertoire of* Xenopipo *finds no match in* Chloropipo.

[*Chloropipo holochlora litae*, Anchicaya River, 40 km inland from Buenaventura, Colombia. Photos: Cyril Laubscher]

that modifications of musculature will come to light, and extreme rates of muscle contraction, comparable to those exhibited by hummingbirds (Trochilidae) in flight. This is an area of manakin research that is only just beginning.

Food and Feeding

Piprids feed mainly on small fruits, supplemented by insects and spiders. They usually pluck fruit in a rapid aerial sally from a nearby perch, landing with the food in the bill and then swallowing it whole, but they will sometimes pluck fruit from a perched position, if it is accessible by this means. Insects, and also small spiders, are likewise typically snatched from the vegetation following a brief flight. When termites (Isoptera) swarm after heavy rains, manakins may hawk for them from treetop perches, as do many other bird species. Some members of the family occasionally accompany mixed-species foraging flocks, and a few regularly do so. Among the few species for which the diets of the sexes have been analysed separately, females have been found to take a higher proportion of animal food than do males.

Sometimes, manakins join other birds in order to feed on insects disturbed by army ants. They usually do so only briefly, however, and they are not very efficient ant-followers, as they hardly ever sally to the ground. Moreover, most manakins use slender horizontal perches, and these are rarely to be found near ground level. E. O. Willis, who has made prolonged studies of ant-following birds in different parts of tropical America, found that in Amazonia the many manakin species rarely follow ants, but some of the same or closely related species attend ant swarms fairly often in Trinidad, Panama and eastern Brazil, where few specialized ant-followers occur. He concluded that the wealth of ant-following antbirds (Thamnophilidae) and woodcreepers (Dendrocolaptidae) which saturate the ant swarms in Amazonia makes ant-following rather unrewarding for manakins.

Manakins have a wide gape, and are able to swallow fruits that are very large in relation to the size of the bird. They often have to "juggle" large fruits in the bill, probably softening them in the process, before they can swallow them. The biggest fruits that the White-bearded Manakin has been recorded as swallowing, those of the rubiaceous plant *Coussarea paniculata*, were 19 mm long and 16 mm in diameter, and the largest ones recorded as eaten by the smaller Golden-headed Manakin, those of the burseraceous *Protium heptaphyllum*, measured 15 × 11 mm. The very wide gape is clearly important in enabling manakins to exploit fruits that cannot be eaten by considerably larger but less specialized frugivores, such as many tanagers.

A greater proportion of insect food is fed to the young than is eaten by the adults. For example, of 93 samples of regurgitated or defecated matter collected from below the display perches of White-bearded Manakins, insect remains were found in only four, the remainder containing seeds; by contrast, eight of 15 samples collected below nests with young contained insect remains. Nearly all of the insect remains consisted of hard parts of flies (Diptera) and beetles (Coleoptera). The Thrush-like Mourner, atypical also in other ways (see Systematics), is more insectivorous than the typical manakins and has been recorded as feeding large caterpillars to its nestlings.

The forests in which manakins live are rich in plants that bear small fruits, and the diets of manakin species are correspondingly varied. In a small area in Trinidad, White-bearded Manakins were documented as feeding on the fruits of 105 different plant species belonging to 27 families, and Golden-headed Manakins, less intensively studied, fed on 43 species. For both piprids, the trees and shrubs of species of Melastomataceae were of greatest importance numerically, and those of the Rubiaceae were second in importance. The major role of these two plant families in the diet of the Pipridae has been confirmed in studies elsewhere, especially in those undertaken by Théry in French Guiana.

Théry's research showed that manakins were the main dispersers of the Melastomataceae species and of the rubiaceous genus *Psychotria* present in his study area. They took an estimated 52-75% of the fruit crop of melastome species, and 61-89% of the fruit crop of *Psychotria*. In addition, they are very efficient dispersers. This is because their flight sallies enable them to select the ripest fruits, including terminal ones not available to other birds, and also because they feed in short bouts, shorter than the time taken by seeds to pass through the gut, resulting in good dispersal away from the parent plant. Moreover, and significantly, they tend to defecate at forest edges, in small clearings and along the courses of streams, sites that are suitable for the establishment of "pioneer plants", a category which includes most of the Melastomataceae and Rubiaceae. Seeds dropped elsewhere remain dormant for a long time, and in the event of a treefall they may germinate; in fact, a high percentage of such seeds in soil in French Guiana are from fruits eaten by manakins. In all these ways, manakins help to ensure the continuing abundance of their food supply.

As outstanding examples among small specialized frugivores in tropical forest, the adaptations of manakins to a diet of small



For some unaccountable reason bathing in water is very important to manakins. In the late afternoon, usually in the last hour of light, individuals of several species may visit streams or water-holes to bathe. In dry forests, or humid forests in the dry season, manakins are amongst the most frequent visitors to these sources of water. As such, it seems likely that this male ***White-crowned Manakin*** *is bathing rather than drinking. Indeed, the high water content of their fruit-based diet means that manakins drink infrequently.*

[*Dixiphia pipra cephaleucos*, Linhares, Espírito Santo, Brazil. Photo: Edson Endrigo]



Many piprids roost at or below human head-height, often at the edge of trails. Thus, they are amongst the birds most commonly found roosting by people walking through forests with flashlights. This female ***Blue-crowned Manakin*** *was found in this way as it roosted low down on a narrow stem. Dependent juveniles are known to roost alongside their mothers, but most adults roost alone. In all likelihood, males are always solitary at the roost, although those with neighbouring display arenas sometimes roost less than 5 m apart. In addition, the roosting behaviour of* Chiroxiphia *manakins is not yet known; perhaps co-operative groups of adult males roost side-by-side, just as they display.*

[*Lepidothrix coronata carbonata*, near Sucusari river, Peru. Photo: Michael & Patricia Fogden]

fruits, which typically have a high water content but low concentrations of nutrients, are of particular interest. An important aspect of these adaptations concerns the fact that the diversity of available fruits may be highly variable, both in regular seasonal succession and unpredictably at times of occasional scarcity. Manakins, therefore, in addition to being able to swallow fruits of a wide range of sizes, must be able to process them rapidly, assimilating the nutrients, mainly carbohydrates, efficiently and getting rid of the seeds as quickly as possible. Consistent with these needs is the fact that manakins' stomachs are small and their intestines relatively short, and they have no crop for storing food. Experimental studies by A. H. Worthington, using temporarily caged Golden-collared and Red-capped Manakins in Panama, revealed that the average passage time of small seeds through the gut was 15 minutes for the former species and 12 minutes, with a minimum of 7 minutes, for the Red-capped Manakin. Seeds with a maximum dimension of more than 5 mm did not pass through the gut but were quickly regurgitated, after an average of 7 minutes and 9 minutes, respectively, for the two species. Efficiency of assimilation of the nutrients in the pulp was variable, as has been found for other frugivores, but it was very high, at 86-98%, for non-structural carbohydrates, the most readily available energy source. These studies also showed that feeding bouts were short, lasting up to 2 minutes, as is the case in the wild, and the birds did not begin a session until the remnants from the previous bout of feeding had been evacuated.

Breeding

Like the majority of bird species inhabiting tropical forest, manakins nest solitarily. For all the typical piprids that have been studied, only the female is concerned with the nest. Manakins do not form pairs, but females that are ready to mate visit the males at their display grounds, where probably all matings take place. Studies of colour-ringed local populations of Golden-headed Manakins and White-bearded Manakins have demonstrated that most females mate with a single male in any one season, and the few that mate with more than one show a strong preference for one particular male. It is always a small number of dominant males at a lek that perform the majority of all matings; indeed, in the co-operatively displaying *Chiroxiphia* species, all matings are performed by the dominant male of the group. Since it may take several years to acquire a dominant position, males may not breed until they are several years old; females, as a rule, probably begin to breed at the age of about one year.

If there is one thing for which the family is renowned, it is its courtship displays. These displays, while not set off by such extraordinary feather adornments as those of some of the cotingas, or the birds-of-paradise (Paradisaeidae), are nevertheless remarkable in that they involve the most complex and elaborate movements, as well as the most highly evolved interactions among individuals, that are known among passerine birds. A predominant feature of this aspect of behaviour is that the males of many piprids display in groups at special leks, which are situated in the same places from one year to the next. The males compete with one another for the females, which visit the leks to mate. The spacing of males at a lek varies greatly, males of *Manacus* species being regularly as little as a metre or less apart, whereas several other species perform at dispersed or "exploded" leks, where males are within hearing distance of, but not in visual contact with, one another. Apart from during the period of the annual moult (see Morphological Aspects), an adult male manakin's whole life is centred on the lek, at which he may be present for up to 90% of the daylight hours (see Movements).

The complexity of manakin displays is two-fold, involving, on the one hand, the display movements and associated sounds, and, on the other, the complexity of social organization. The main features tend to be similar among members of the same genus. Limitation of space prevents a detailed description of all those which have been described, and the following is a necessarily selective summary.

The lek behaviour of the Golden-headed Manakin is a good example, central, so to speak, in terms of both its complexity



The true manakins are quiet birds when not displaying at their courts, but their displays are a different matter. Male White-bearded Manakins (Manacus manacus) *make a great variety of noises, including some loud snapping sounds produced by hitting the upper surfaces of the wings together at take-off. The* ***Red-capped Manakin*** *has recently been shown to make three kinds of sharp snapping or clicking sounds during its displays, all in very different ways. One is made by the wings alone, another is caused by brushing the tips of the primaries along the raised and fanned tail, and the third is made by striking the ventral surface of the wing against the side of the body and the thigh. The displaying male also makes sharp "psip" notes, and long descending "p'tsweeeeeee" calls. Were it not for sounds like these, manakin leks would be hard to find in the gloom of the forest. Luckily, leks are often so noisy that they announce themselves even when far off the trail.*

[*Pipra mentalis ignifera*, Panama. Photo: Marie Read]

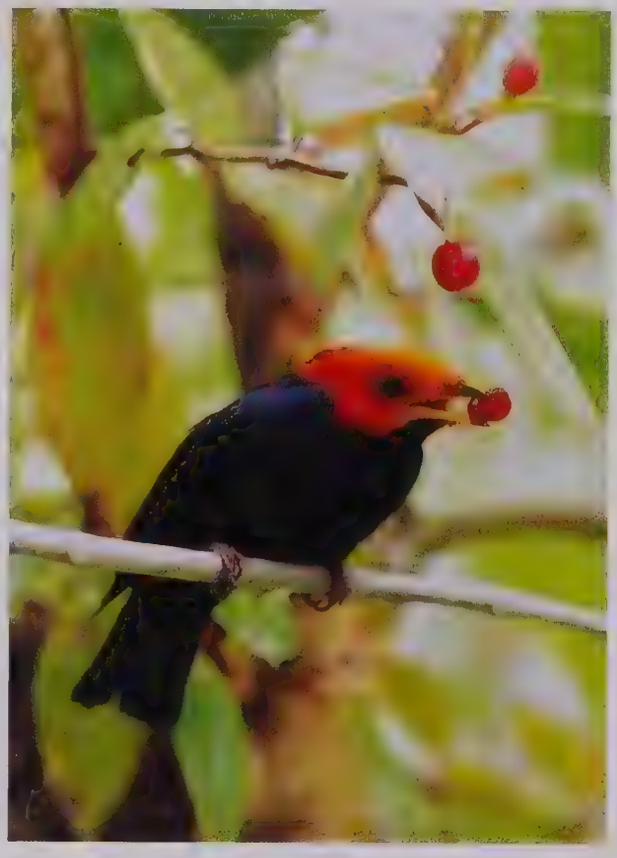


*Manakins pluck fruit with gusto, usually during brief aerial sallies. To this end, they have a broad bill in relation to their body size, allowing them to swallow relatively large items. The **Golden-headed Manakin** is tiny, only 80-90 mm long, but it can eat fruit measuring 15 mm by 11 mm, a feat equivalent to a guan (Cracidae) swallowing a coconut! This individual is after more manageable fare: the fruits of a melastome shrub (Melastomataceae). These plants are regularly visited by manakins, and play an important role in manakin ecology. Manakins in turn play a role in melastome ecology by dispersing the seeds, thus ensuring the abundance of their own food supply.*

[*Pipra erythrocephala erythrocephala*, Santa Elena, Bolívar, Venezuela. Photo: Andy & Gill Swash]

and the relationship between the individual males, and it has been well studied. The males display under the canopy of lower-storey trees, on more or less horizontal small branches at a height generally of about 6-12 m. Each has a main perch, on which, if he is successful, mating takes place. The perches may be as little as 2-3 m apart and in the same tree, or 10 m or more apart and in adjacent trees. The number of males constituting a lek is variable, depending, at least in part, on the local population density. In Trinidad, where the Golden-headed Manakin is particularly numerous, leks can consist of up to twelve males. For most of the day, apart from short absences to forage, and for most of the year, except for the moult period, males are present at the lek. They often perch, inactively, for long periods, although they frequently utter short calls, and they keep the immediate surroundings of the perch clear of obstruction by continually attempting to remove any hanging leaves or vine tendrils.

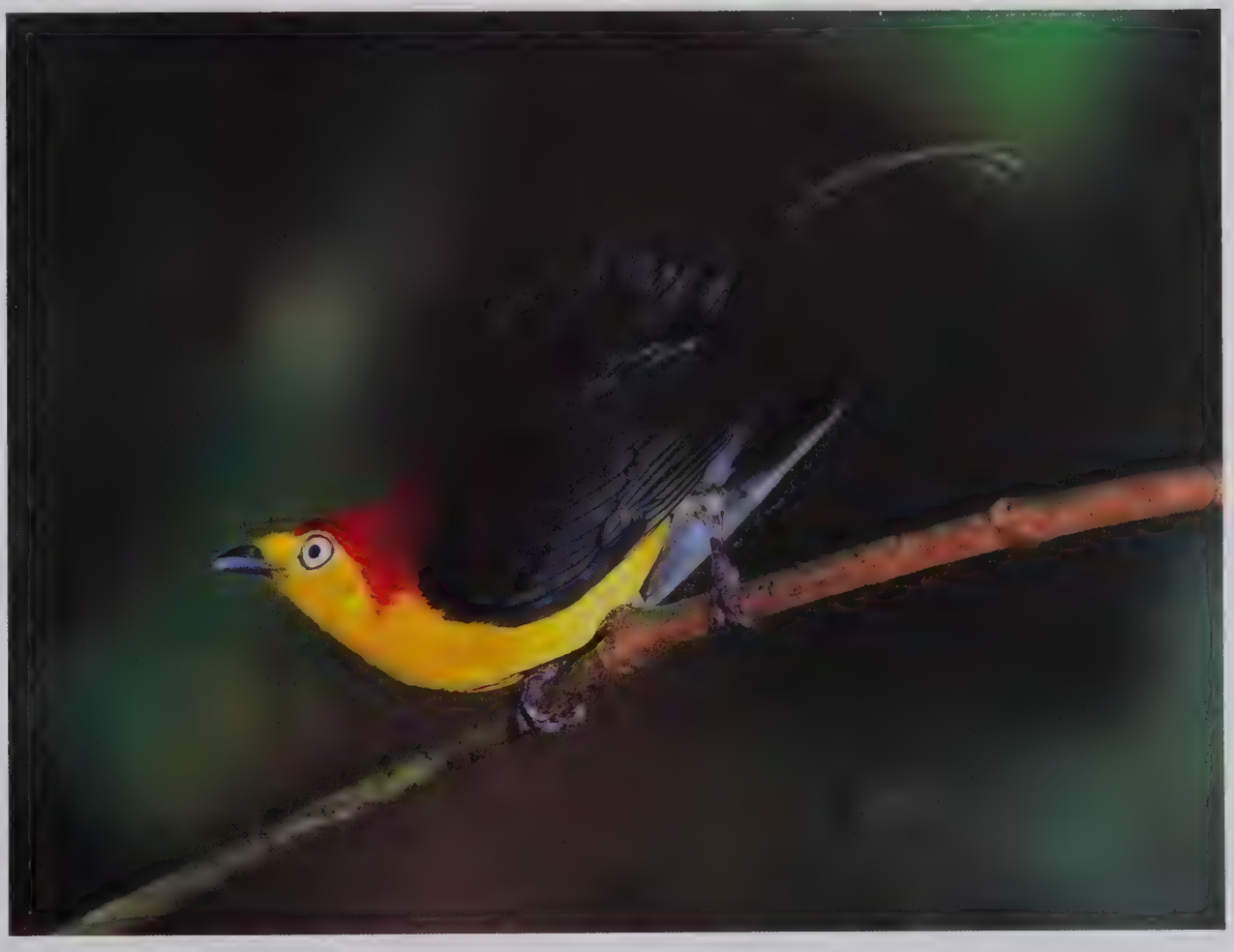
Active display can occur at almost any time throughout the day, but is most frequent in the hour after sunrise and in mid-afternoon. Although it may occur spontaneously, it is conspicuously stimulated by the arrival of a female at the lek. The posture and movements involved in the display are highly stereotyped and very diverse, consisting of the following five elements. The first is known as "darting back and forth": with the legs fully stretched so that the red and white thigh feathers become conspicuous, and with the body held horizontally, the manakin makes rapid flights to and fro between its main perch and an adjacent one 1-1·5 m away, the wings producing a brisk humming sound in flight between the two perches; on landing, he at once turns about rapidly to face in the direction from which he came. In the second element, the "about-face", the bird makes rapid about-face turns, so quick that the foot movements cannot be clearly seen; these may be repeated while the bird remains in the same place, and each turn may be accompanied by an upward flick of the wings. Next is the "backward slide", in which the bird, with legs stretched, head held low and tail elevated, moves with very short and rapid steps, so that it seems to slide, backwards along the perch for about 10-20 cm; at the end of the slide, the tail is suddenly depressed and fanned and the wings are raised and held vertically above the back. Sometimes, halfway through the slide, the wings are suddenly spread horizontally and then closed again. The fourth display element, the "upright posture", is a stiff, almost statuesque posture, with head and body nearly vertical, which may be held for several seconds, the bird clinging to the side of the perch rather than perching on it; during this, the pupil is greatly contracted and the bill may be slightly opened. The fifth and final element is the "display-flight". This begins with the male leaving his perch and flying to a somewhat higher one some 15-25 m away, where he perches, facing the main perch, utters two or three sharp mono-



*Red pigments are prominent in manakin plumage, and in the strategies adopted by plants to attract manakins to fruit. Both plant and plumage are designed to exploit the spectral sensitivity of the avian eye. Typical manakins, such as the **Red-headed Manakin**, are very largely frugivorous, though they also eat a small proportion of insects and spiders, and feed their nestlings on a much higher proportion of animal matter. Some other genera, including* Schiffornis *and* Neopelma *(both only dubiously included in the family), are much more heavily reliant on insects.*

[*Pipra rubrocapilla*, Jenaro Herrera, River Ucayali, Loreto, Peru. Photo: José Álvarez Alonso]





Like many cotingas (Cotingidae) and birds-of-paradise (Paradisaeidae), male manakins of numerous species spend a large portion of their adult life advertising for mates at communal display sites, or leks. These leks are permanent and static, and females visit them to choose the father of their projected offspring. Fatherhood is only achieved by a few dominant males, none of whom make any contribution to parental care. As a consequence, through sexual selection, there is powerful evolutionary pressure on males to outdo their rivals when showing off to females, and it is this pressure that decorates them with gorgeous plumage, and shapes their marvellous displays. The latter involve the most elaborate movements and complex interactions found in any passerine birds. For their dances and costumes, the manakins are justifiably famous. Male ***Wire-tailed Manakins****, for example, are clothed in black, yellow and red. The shafts of their tail feathers are elongated into fine curved filaments, longest in the outermost pair. Thus attired they perform a complex co-operative display 2-4 m above the ground. This begins with co-ordinated flights between alpha and beta males, and reaches a crescendo when a female alights on the display perch. At this signal, the alpha male pivots his body back and forth, vibrates his wings, and approaches the female backwards. Then he does something remarkable: he tickles her chin with the shafts of his tail feathers. The use of an appendage as a tactile organ is very rare in birds; the lower photograph shows a male perched in readiness for this feat. If the female is suitably impressed, copulation ensues.*

[*Pipra filicauda filicauda*, Explorama Lodge, Quebrada Sucusari, Peru. Photos: Jordi Bas]

syllables, and then takes off and returns to the main perch in extremely rapid flight, uttering a succession of the same monosyllables which speed up and become sharper as he nears it; he approaches the main perch with a rapid downward swoop followed immediately by an upward swoop, and as he lands he utters a sharp buzzing call. Immediately on landing, he usually executes a backward slide.

As already mentioned, some or all of these displays are intermittently performed when no female is present. On the arrival of a female, however, display by all the males at the lek becomes intense and continuous. A female's behaviour is variable, being probably dependent on her familiarity with the lek and on her breeding condition; she may herself perform some of the display movements, but in less intense form. When ready to mate, she eventually goes to the main perch of one of the males. Occasionally, when the two are perched close together, she pecks very lightly at the male's brilliant orange crown feathers. Copulation may be preceded by any of the above-mentioned displays with the exception of the upright posture, which is used in more aggressive contexts. Mating often ensues immediately after a display-flight, the male landing beside the female and then mounting.

Although the details differ, the courtship displays of the Red-headed and Red-capped Manakins, both closely related to the Golden-headed Manakin, follow the same pattern. Very different is the lek behaviour of the White-bearded Manakin, the males of which display in compact groups on and near the forest floor. Each male clears a small "court", usually roughly circular or oval and about a metre across, removing all fallen leaves and other debris. Each court must have around it at least two, and generally three or four, vertical stems, usually of saplings; one of these is of special importance, as mating takes place on it. Courts are usually compactly grouped, sometimes even immediately adjacent to one another, although more often a metre or two apart. The number of courts at a lek varies greatly, and can number 50 or more in places where the manakins are abundant. At large leks, competition for central courts, where most of the matings take place, can be intense, leading to prolonged and violent fighting between the owner and a would-be usurper.

Like Golden-headed Manakins, male White-bearded Manakins are present at their courts for the greater part of the day and of the year. When not actively displaying, they utter simple, mainly monosyllabic calls. Bouts of display may occur throughout the day, but are concentrated in two periods, the hour after dawn and the early afternoon, and these are the times when females most often visit the leks. The display repertoire of this species consists of three distinct elements. The first of these, and the commonest display, involves jumps between vertical stems. Perched sideways on one of the vertical stems on the court's periphery, with the long throat feathers thrust forward to produce a "beard" that projects beyond the bill tip, the bird leaps across to one of the opposite stems, turning as he lands so as to face the way from which he came; at the moment of take-off, he makes a loud snap by striking the upper surfaces of the wings together above the back (see Voice). He may rapidly repeat the manoeuvre, either to and fro between two stems or irregularly around all the vertical stems surrounding the court. When a closely packed group of males is performing together, the impression is of a confusing collection of jumping black-and-white fire-crackers. The second element of display is less common, being performed only occasionally. After a series of snap-jumps ending low down on the mating perch, a male remains on the perch for a few moments, tense and quivering, with head and body pointing obliquely downwards; then, with a snap, he leaps to the ground, turning in the air, and on landing immediately leaps, making a curious grunting sound, back up to a higher position on the mating perch, and then, taking very rapid short steps, he "slides" down the perch while beating his wings. This sequence, of snap to ground, upward leap with grunt, and slide down perch, is in fact the stereotyped sequence of pre-mating movements. The third element, fanning, is a very distinct but comparatively infrequent display, most often directed to a female on her initial approach to a court. The male crouches, with head retracted between the shoulders, sways from side to side, and beats his wings with a low whirring sound; as the wings are raised, the long neck feathers are pushed forwards and upwards and appear as two flickering white puffs, one at each side.

When a female visits a male's court in order to mate, she usually first joins him in a co-ordinated dance of to-and-fro jumps between the mating perch and an adjacent perch, the two birds crossing one another in mid-air, until finally the female lands on the mating perch and remains there. This is the signal



Tending a display court is a full-time job. Adult male manakins often spend up to 90% of their day in attendance, and rarely stray very far from the area. Their only vacation is during the annual moult. This ***White-bearded Manakin*** *is busy maintaining a circular or oval court, roughly a metre wide, and free of litter. Each court has on its border two or more slender vertical stems, between which the owner makes rapid jumps accompanied by loud snaps. In larger leks, courts may be very close to one another, especially in the central area, sometimes leading to violent fights between rival males. Most matings take place in the central area of the lek.*

[*Manacus manacus trinitatis*,
Trinidad.
Photo: M. D. England/
Ardea]





There is no pair bond in manakins. As soon as the female is ready to mate, she visits a lek and selects a suitable male. Her arrival invariably stimulates a flurry of activity amongst the contestants vying for her attention. Perched a few metres above the ground, the male ***Red-capped Manakin*** *pulls out all the stops. He hops back and forth on his perch, extending his thighs to show off his fine yellow "trousers". Every few seconds, he makes a rapid darting flight to an adjacent perch, accompanied by a loud whirring of wings. On landing, he immediately executes an "about-face" and returns to his original perch. Here he performs his* pièce de resistance, *the hugely fetching "backward slide", which involves holding the head down, elevating the tail, and moving with short rapid steps on stretched legs so that he seems to glide in reverse for 10-20 cm. At the end of this manoeuvre, the tail is pressed down and fanned, and the wings are raised vertically for a few moments, as if in triumph. Throughout this magical performance, a variety of sharp and sweet vocalizations are given.*

[*Pipra mentalis ignifera*, Soberanía National Park, Panama. Photos: Marie Read]



Although male manakins attend their display arenas for most of the day, and much of the year, they are often perched quietly, or just occasionally calling. The periods of most intense display activity are the hour after dawn and the early afternoon. In all species, the action is particularly frantic when a female arrives on the scene. The male ***Golden-collared Manakin*** *clears a court similar to that of the White-bearded Manakin* (Manacus manacus). *When the female selects a male to mate with, she and the male perform co-ordinated to-and-fro flights between the court's main vertical stem and the auxiliary stems, passing each other in mid-air.*

[*Manacus vitellinus vitellinus*.
Panama.
Photo: Marie Read]

for the male to perform the pre-mating sequence described in the preceding paragraph, culminating in the "slide down the pole" on to the female's back.

The courtship behaviour of the three other *Manacus* species is extremely similar, and in most details in fact identical, to that of the White-bearded Manakin. This indicates a relatively recent splitting of the four species, which differ mainly in the presence or absence of yellow or orange pigment in the male plumage, and which interbreed to form narrow hybrid zones where their ranges meet (see Systematics).

A new level of complexity is reached in the lek displays of the "*Pipra aureola* group", comprising the Crimson-hooded, Band-tailed and Wire-tailed Manakins. In this case, additional males, referred to as "beta males", perform co-ordinated displays centred on the mating perch of a dominant male, "the alpha male", which alone mates with the females visiting that perch. The most striking feature in the co-ordinated display consists of precisely alternating display-flights similar to those of the Golden-headed Manakin. In quick succession, each male flies in and lands on the mating perch. As one bird approaches in rapid flight, the other, a moment before the incomer alights, leaves and flies back to the taking-off perch some 20 m away, then at once flies back in and displaces the first, and so it may continue for minutes on end. The beta males are younger birds, which, unlike the alpha males, are not sedentary but move around, competing with one another to take part in the older, established males' displays. The display repertoires of the three species are very similar, but with one extraordinary difference. In the culminating phase, the male, with tail raised, backs towards the female on the mating perch. Whereas two of the species have a tail of normal shape, the male Wire-tailed Manakin has uniquely modified rectrices ending in long wire-like projections, with which, when he has backed close to the female, he vigorously brushes her chin, rapidly pivoting his upturned body from side to side. This treatment is evidently agreeable to the female, as she perches quietly, facing him, with bill raised to present her chin.

The most elaborate display repertoire and social organization in the family, and perhaps among all birds, is that found in the genus *Chiroxiphia*. The display of the Yungas Manakin (*Chiroxiphia boliviana*) is unrecorded, but for the other four species the pattern is essentially the same. The Blue-backed Manakin may serve as the example.

Male Blue-backed Manakins display, and mate, on slender, more or less horizontal and typically slightly bowed stems or branches about 1-1·5 m above the ground in forest undergrowth. Each mating perch is "owned" by a dominant male, with which a small number of subordinate males are associated. The courtship display consists of four distinct stages. The first stage is duetting. The dominant male, perched at some height near his mating perch, calls at regular intervals until he is joined by one of his subordinates. The two then perch side by side, facing in the same direction and almost touching each other, and begin a loud synchronized duet in which the subordinate bird utters each note a fraction of a second after the dominant bird, the slight time difference producing a characteristic ringing sound (see Voice). After calling thus for a little time, the two birds fly down to the mating perch for the next stage. This second stage, the jumping display, has as its basic movement a fluttering jump. The bird crouches, and then jumps up with wings fluttering, bill pointing downwards and legs dangling, and hangs momentarily in the air before landing back on the perch; while in the air, he utters a strange vibrant, twanging call with the bill wide open. Typically, the two birds jump alternately, side by side, one beginning his jump as the other lands. The rhythmic twanging calls of the two jumping birds is often the main clue guiding a human observer to a mating perch, which is otherwise often difficult to locate in the tangled woody undergrowth. As the display proceeds, the jumps become lower and more rapid, and the calls become more irregular and confused, and take on a bleating quality. Finally, the last bird to jump emits a louder and more distinct bleating note, followed at once by one or more quite different, high-pitched "zeek" notes, after which both fly off. The third stage is the cartwheel dance. This is a modification of the jumping display and is performed in response to the arrival of a female on the mating perch. The two males turn to face her; the foremost male jumps up, hovers in the air, facing the fe-



*In the **Golden-collared Manakin** and its relatives, mating follows a set pattern. If the female is receptive, after a series of co-ordinated criss-crossing flights with the male between the vertical stems around the court, she lands on the mating perch and stands her ground as the male approaches. He lands below her, pauses for a moment with beard extended and wings quivering, then leaps to the ground at lightning speed, "bounces" up to land above her, and then "slides" down towards her and mates, with one foot on her back and the other on the stem. This species is a common bird in much of its Central American and Colombian range. It is very closely related to the White-bearded Manakin* (Manacus manacus)*, and indeed there is a distinct hybrid swarm at the junction of their ranges in the Cauca Valley of Colombia.*

[*Manacus vitellinus vitellinus*, Panama. Photo: Marie Read]





The most complex displays are performed by members of the genus Chiroxiphia. *Of these, the* ***Long-tailed Manakin*** *has been well studied in Central America, but the essential elements seem roughly similar throughout the genus. A typical display sequence proceeds as follows. The alpha male shares a slender horizontal perch with one or more subordinant associates (beta males). He calls near this perch until a beta male lands at his side and duets with him. Both birds then fly to the perch to perform a jumping display: the beta male crouches, while the alpha male flutters up into the air with bill pointing downwards and legs dangling. For a split second he hangs in mid-air, gives a peculiar twanging call, and then drops back onto the perch. At this point, the beta male performs an identical jump, and the sequence is repeated so that at any particular time one or other bird is in the air. The whole process accelerates, and the calls get more jumbled, until the alpha male utters a loud bleating noise then a screechy series of "zeek" notes, after which one or both birds fly off into the undergrowth.*
The so-called "cartwheel dance", performed when a female lands on the perch, is an escalation of this performance. Facing the female, the airborne male moves backwards, while the perched male shuffles forwards, so that the two birds rotate in front of her, as seen here (below).
In the Blue Manakin (Chiroxiphia caudata), *up to four collaborating males gather shoulder-to-shoulder. Each male jumps when it reaches the front of the queue and lands back down at the rear, while all males shuffle along the perch to keep in the same position. The resulting cartwheeling cacophony is not often witnessed, but it ranks as one of the most amazing spectacles in the natural world.*

[*Chiroxiphia linearis fastuosa*, Monteverde Forest Reserve, Costa Rica. Photos: Marie Read]



This photograph captures a pair of ***Long-tailed Manakins*** *performing the last act of the* Chiroxiphia *display. The terminal element in the sequence only begins if the female remains on the perch after the "cartwheel dance". If she does, the alpha male flutters around her in a bouncing, butterfly-like flight, occasionally perching momentarily. Whenever he alights near the female, he crouches facing her, revealing his shimmering blue mantle, and his crown patch, which is flattened into two crimson horns. Finally, he lands at her side and mounts, nipping her nape feathers for balance. Without exception, copulations always take place on the display perch, and always involve the alpha male.*

[*Chiroxiphia linearis fastuosa*, Monteverde Forest Reserve, Costa Rica. Photo: Marie Read]

male, and then moves back, still hovering, while the other male shuffles forward to take its place and in turn jumps up as the first bird lands behind it. Thus, the two males move in the form of a revolving wheel. As in the jumping display of two males by themselves, the cartwheel dance in front of a female, accompanied by the rhythmic twanging, becomes more and more rapid, seemingly frenzied, until it is brought to an end by the sharp "zeek". This is, in fact, uttered by the dominant male, the perch-owner, and is the signal to his dancing partner to leave, the latter's part in the display being completed. The fourth and final stage is the pre-copulatory display. If the female has stood her ground and remained on the mating perch, rather than, as often happens, leaving when the cartwheel dance ends, the dominant male begins a further, quite different and mainly silent display. He flutters around the female with a bouncing, butterfly-like flight, silently crossing and recrossing the display perch, every few seconds alighting momentarily and then flying on. If he alights near the female, he faces her, crouches with head lowered, thus exhibiting the blue patch on his back, and vibrates his wings. As the head is lowered, his red crown is presented squarely to the female, appearing shield-like as the two small lateral "horns" are extended. The female is thus presented with a red shield surmounted by a vibrating patch of shimmering blue. The female turns constantly to face the male, intently watching his performance. Occasionally, the male flies out to a more distant perch, faces the female, and, uttering a low twanging note, takes off with an audible click of the wings and resumes the bouncing flight. Finally, he flies to the mating perch, lands beside the female, and mounts.

The courtship displays of the other well-known *Chiroxiphia* species differ mainly in the first stage, the duetting calls being quite distinct. The display of one of them, the Blue Manakin, further differs in that three males regularly take part in the cartwheel dance, and occasionally more do so, perching close together and shuffling forward in line as the individual nearest the female jumps up.

By contrast, the two *Corapipo* species, the White-ruffed and White-throated Manakins, as well as the Golden-winged Manakin, are unusual in that they mate on fallen logs on the forest floor. The social organization of these three has been puzzling. Whereas some accounts describe single males in apparently uncontested ownership of a log, others mention groups of males, up to seven in one case, displaying together on and around a log in a more or less co-ordinated manner, and apparently moving as a group from one log to another. The most recent study of the White-ruffed Manakin, by L. Rosselli and co-workers, which included colour-ringed birds, indicates that each log is the property of a dominant resident male. When females visit for mating, which occurred at 12:45 and 14:47 hours in the two cases observed, that male alone is present, while earlier in the day other males, both adult and immature, are permitted to come and take part in communal, and at times co-ordinated, display among themselves or with the resident male. The function of these communal displays is probably that of establishing and maintaining a hierarchy of males within the local population.

The pre-mating display of the White-ruffed Manakin is one of the most elaborate and impressive. Following a series of flight displays close to the ground, ending with the female perching on the central part of the log, the male flies up from the log in a series of steep spirals until he is above the forest canopy; there he hovers briefly, while uttering one or more very high-pitched calls, before plummeting down to the display-log, landing beside the female and, at the moment of landing, making an explosive snap, almost certainly with the wings, followed instantly by one or two high notes and a sharp buzzing "wah", both probably vocal. Thereupon he immediately jumps over the female, hops towards her, and mounts.

Recently, it has been found that *Heterocercus* and *Tyranneutes* species also perform high flight displays. The most spectacular of such performances that is known is that of the Orange-crested Manakin. The male flies steeply upwards, in a series of spirals of decreasing size, to a height of 60-100 m above the forest canopy. From there it plummets down, gaining momentum for the first 15-20 m with rapid wingbeats, and then partially closes its wings and continues its descent in this posture, producing a peculiar hissing sound that becomes louder as the bird's velocity increases. When it is 2-3 m above the canopy it abruptly changes direction by nearly 90 degrees, producing



Manakins are some of the least egalitarian of birds. Females build the nest, incubate the eggs and rear the chicks alone. Males contribute nothing but sperm. The typical nest of true manakins is a small cup hung hammock-like between two horizontal forking twigs. It is bound to these twigs by cobwebs and plant or fungal fibres. In the ***White-collared Manakin****, the nest is unusually large, but the female's green plumage provides perfect camouflage in the dark understorey. To reduce the likelihood of predation further, she covers her nest with pieces of dead leaves and moss, and attaches a "tail" of vegetation. Although this increases the overall size of the nest, it confers extra camouflage in humid areas, where tangles of vegetation and strands of moss are common features in the undergrowth.*

[*Manacus candei*, Costa Rica. Photo: Michael & Patricia Fogden]



One of the perils of incubation in humid forests is the ever-present mosquito. These insects often settle on the head of incubating birds, and bite the small patches of bare skin accessible around the eyes and bill. In day to day life, small birds move too quickly for mosquitoes, and during the night roosting birds tuck their heads safely under their scapular feathers. An incubating bird is vulnerable because it must not draw attention to itself, and therefore never moves. Whether the unwelcome attention of mosquitoes is causing any discomfort to this female ***White-collared Manakin*** *is impossible to assess: it will sit motionless, with limitless patience, no matter how ruthlessly it is besieged.*

[*Manacus candei*, Costa Rica. Photo: Michael & Patricia Fogden]

an explosive "pop". Finally, the manakin flies in a wide horizontal arc above the canopy, before entering the trees at great speed and returning to its terrestrial court.

The impossibility of adequately observing such a display in closed forest will be obvious. Detailed observation of the Orange-crested Manakin's display, by J. Álvarez, was made possible by the species' riverside habitat, enabling the whole performance to be seen from a boat. The high aerial displays of the two *Tyranneutes* species have been watched from a canopy crane and a canopy tower. B. Walther, watching from a canopy crane in Venezuela, has observed the Dwarf Tyrant-manakin (*Tyranneutes stolzmanni*) to fly straight up with very fast wingbeats from a perch at the top of a very tall tree to a height of 20-30 m and then "dive-bomb", in the manner of an aggressive hummingbird, back to the same perch. In Brazil, K. J. Zimmer, watching from canopy towers, has seen similar displays performed by the Dwarf Tyrant-manakin in Para and by the Tiny Tyrant-manakin (*Tyranneutes virescens*) near Manaus. How these spectacular displays relate to the species' behaviour at ground level is unknown. Male Tiny Tyrant-manakins call from low perches about 2-6 m above the ground, and make floating flights with rapidly beating wings between these perches.

A common feature of all the manakin lek displays that have been well studied, with individually marked birds, is that, in any one season, most or all of the matings are made by only one or a few of the males, and some males have no mating success at all. In large leks, the successful males are usually those occupying the more central display perches or courts. This at once raises a number of questions, which have been extensively discussed but not all unequivocally answered, concerning the factors that influence females in their choice of a mate. Among males, there is constant competition for central positions in a lek or, in the case of species with joint displays, for dominant status at a mating perch; therefore, a female would choose wisely by simply mating with central or dominant males, because they are likely to be efficient, vigorous individuals. This would not, however, explain the evolution of the males' extravagant displays and adornments, unless the central or dominant males also have the most spectacular performances, and yet the most careful observations and measurements of the few species studied in detail have failed to show any such correlation. However, one must bear in mind that birds certainly recognize many of their neighbours individually, presumably by using very subtle differences in appearance, voice and behaviour that humans cannot detect. In addition, there is some evidence that females are, as it were, "fascinated" by the males' adornments and show this by lightly pecking or touching them with the bill; thus, there would be scope for selection of males on the basis of their individual structural or colour differences. It is difficult otherwise to understand how the extravagant displays and associated plumage have evolved, as Darwin argued long ago. It has been suggested that competition between males, rather than female choice, may be the main selective agency affecting male physical characters. This is presumably the case for animal species in which the males fight for dominance, as with, for example, many mammals, but it seems highly unlikely to apply to manakins and other birds with highly ornate males, as the most elaborate displays are so clearly directed towards, and normally visible only to, the females.

Another intriguing question raised by such displays concerns those in which two or more males engage in some form of co-ordinated display, culminating almost invariably in mating being achieved only by the dominant male. What do the subordinate individuals get out of it? Long-term study of colour-ringed birds, most notably D. B. McDonald's study of the Long-tailed Manakin, has provided what is almost certainly the correct explanation: namely, that the subordinate males, in a ranking order based on age, are awaiting their turn to take over the dominant male's position when he loses it. Meanwhile, by displaying with him, they are gaining experience and maintaining the attractiveness, for females in the area, of the traditional display area and mating perch. This would not be a sensible strategy if annual mortality were high and senility in consequence rare, as is prevalent among many small north-temperate passerine birds. Adult manakins, however, are known to have high annual survival rates, of the order of 90%, and there is evidence that senility or loss of vigour may be quite usual, so that a younger male may have a very good chance of being able to take over the position of a dominant older bird. Even so, it is amazing that a male Long-tailed Manakin may have to wait up to ten years before achieving dominant status and being able to mate.



In many piprid species, nests are tiny, flimsy structures, not much larger than hummingbird nests, and easily identifiable by their hammock-like design. In some cases the structure is so loosely woven that the contents can be seen from below. Most manakins nest low down, and this ***Crimson-hooded Manakin*** *is no exception: she has built her nest on an open branch within a few metres of the ground. Despite its open aspect, her nest has been overlooked by predators due to its small size.*

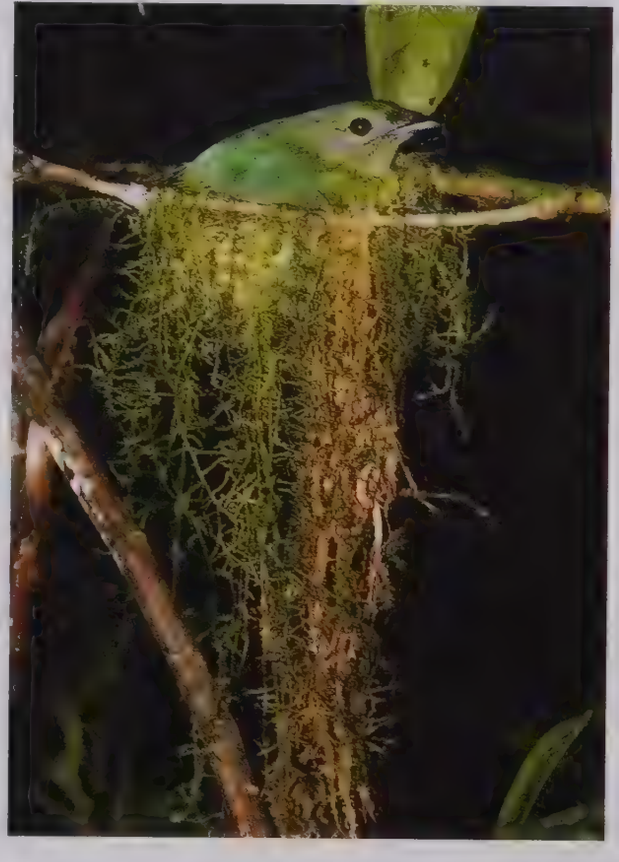
[*Pipra aureola aureola*, Rorota, Rémire-Montjoly, French Guiana. Photo: Olivier Tostain/ EcoBios]

The evolutionary interpretation of piprid behaviour can be only briefly touched on. There is general agreement that an underlying prerequisite for the kind of social organization so strikingly illustrated by the manakins, characterized by conspicuously ornamented and conspicuously displaying polygamous males, and cryptically coloured females which single-handedly undertake all nesting duties, is the mainly frugivorous diet, which allows adults living in a rich forest habitat to feed themselves in a very small fraction of the daylight hours. Combined with this, there is good reason to suppose that the intense nest predation to which manakins, as other tropical-forest birds, are subject has resulted in their building very small, inconspicuous nests, capable of holding a maximum of two nestlings, which the female can rear alone, the presence of a brightly coloured male at the nest being positively disadvantageous. Under such conditions, intense sexual competition among males has arisen.

Exactly how the elaborate and even bizarre courtship behaviour has evolved in the Pipridae has been much discussed, with outstanding contributions by Prum. What has clearly emerged from Prum's analyses of manakin evolution, based on morphology, behaviour and DNA, is that the extraordinarily varied elements of their displays, including their spatial organization, have a strong phylogenetic component; in other words, they must have a long evolutionary history and, for the most part, are not recent responses to the present-day ecological conditions to which the different species are subject. The most likely evolutionary mechanism seems to be one proposed long ago by R. A. Fisher, who suggested that there has been some kind of linkage between genes producing extreme traits in males and genes determining female preference; put simply, females prefer the most extravagant males. Such a mechanism could, as seems to have occurred with the manakins, lead to the evolution of essentially arbitrary male characters and displays.

Like those of many birds of tropical forest, manakin nests, although not placed in thick cover, are small and hard to see; some are camouflaged. They are generally sited within a few metres of the ground, and the nests of some species are very low down. The result is that, while the nests of some manakins have never been found, those of a few of the most abundant species have been located in good numbers. Most of what is known of the family's breeding biology is therefore based on just a few species.

Breeding seasons of the few well-known species are long, extending over several months. Most of the available information originates from studies carried out north of the equator, in Central America and Trinidad around latitude 10° N, where the dry season, usually from about January to mid-May, is followed by a wet season lasting, usually with a minor interruption in September or October, until the end of the year. Under this seasonal regime, manakins begin to breed at some time in the dry period and continue into the wet, breeding usually being at its



In all manakins studied so far, the clutch consists of two eggs. The first is usually laid around midday, the second roughly 48 hours later. Beyond this, very few studies have focused on the piprid breeding cycle. There are no data about incubation period in the ***White-fronted Manakin****, but in several relatives it seems unusually protracted. The fledging period is shorter, and closer to what might be expected for birds of their size. In the genus* Lepidothrix*, there are records of incubation periods of 17-5-19 days, and fledging periods of 13-15 days.*

[*Lepidothrix serena*, Nouragues Natural Reserve, French Guiana. Photo: Olivier Tostain]



During the fortnight after laying female manakins spend most of each day on the nest. They break up the time spent incubating into a series of sessions, each lasting a minimum of one hour, and a maximum of several hours. All foraging is conducted in a few short absences, a strategy facilitated both by the abundance of small fruits in the forest understorey, and by the ease with which they are found. While incubating, female manakins shield the eggs from heavy downpours, as this ***Helmeted Manakin*** *has done; they also sit tight when approached by humans. Often, they only flush when a hand reaches out to touch them.*

[*Antilophia galeata*, Minas Gerais, Brazil. Photo: Anita Studer]

height in April-June. Individual females may make repeated nesting attempts in the course of a single season. Following the breeding season, adults undergo a complete moult which lasts, in the case of the White-bearded Manakin, for about 80 days. Studies of manakins in Trinidad and Panama have indicated that initiation of breeding is associated with, and apparently dependent on, an increase in the availability of fruit, and that the timing of this increase may be annually highly variable. Nevertheless, caution is needed in generalizing from findings in these two areas. This is demonstrated by the fact that, in Costa Rica, the White-ruffed Manakin, an altitudinal migrant (see Movements), was found to leave its breeding area when fruit was abundant and to return to breed at a time of overall scarcity.

A typical manakin nest is a very characteristic structure, easily recognized as such even if the owner is not seen. It is a small cup, constructed from vegetable fibres, leaf midribs, fungal rhizomorphs or other fine material, suspended in a fork between two horizontal diverging twigs, to which it is bound by cobweb or fungal rhizomorphs, or a combination of both. In places where large ferns are abundant, it may be suspended between two adjacent fern frondlets. The nest of some species is covered on the outside with pieces of dead leaves or moss, and may have a "tail" of dead leaves, moss or other material hanging down below it, thus increasing its apparent bulk but obscuring the rounded bottom of the nest cup. Such nests, when seen from the side or below, can be almost indistinguishable from the bunches of dead leaves that are commonly caught up in the forest undergrowth. The only known exceptions to this general form of nest are those of the Thrush-like Mourner, which builds a bulky nest in a quite different kind of site, and the Wing-barred Piprites (*Piprites chloris*), with a cavity nest. However, *Schiffornis* and *Piprites* are among the genera of uncertain affinities that are included in Pipridae only for historical reasons and for want of a clearly preferable alternative (see Systematics).

Perhaps the most extreme instance of adaptations designed to make the nest inconspicuous is that of the Orange-crested Manakin, the nest of which has only recently been discovered. Typically slung in a horizontal fork, the nest was so loosely woven, from vegetable fibres, that the observer could easily see through it from below. The incubating female adopted an exaggeratedly upright posture, with most of her breast well above the nest rim and the entire tail and undertail-coverts clearly in view, angled downwards, the nest itself being practically invisible. Thus, the visual impression was of a perched bird in a state of vigilance. There are clear analogies to this in the nesting strategies of some cotingas in the genera *Lipaugus*, *Xipholena* and *Procnias*.

Manakin eggs are rather large for the size of the bird. For example, those of the Red-capped Manakin measure 21·5 × 15·9 mm and those of the Orange-collared Manakin (*Manacus aurantiacus*) 20·5 × 14·9 mm. The ground colour is whitish, or pale cream-coloured, buff or grey, variably but often quite heavily marked with brown. So far as is known, the clutch size of all species is almost invariably of two eggs; occasional apparent single-egg clutches are probably the result of egg loss caused by predation. Eggs are usually laid around midday, the second about 48 hours after the first. Bearing in mind the small size of these birds, the incubation period is relatively long: a period of 16-17 days is recorded for the Golden-headed Manakin, 17·5-19 days for the Blue-crowned Manakin, 18-19 days for the White-bearded and Orange-collared Manakins, and 20-21 days for the Thrush-like Mourner. Fledging periods are less well documented, as nestling predation tends to be high, but they are not correspondingly long, being 13-15 days in the case of the Blue-crowned, White-bearded and Golden-collared Manakins.

Incubating female manakins spend long sessions on the nest, with relatively short absences for foraging. Thus, they devote a higher proportion of the day to incubation than do most small birds of other families. This is made possible by their diet of small fruits, which are usually abundant in the near vicinity. They are often very "tame", permitting a very close approach, even to the extent of allowing themselves to be gently touched. Sessions of incubation frequently last for more than an hour, and can be as long as 3-4 hours. The newly hatched young are pink-skinned, with a sparse covering of grey down, an exception being the chicks of *Schiffornis*, which have a copious down. They are fed with a mixture of small insects and small fruits, which the female carries mainly in her throat, although a few items may be held in the bill. Feeds are infrequent, usually one or two per hour for older nestlings. The female at first removes the chicks' droppings, but older nestlings defecate over the nest rim, so that the ground below is spattered with droppings by the time they are ready to fly. This is a rather surprising habit, as the low nests of, for instance, the White-bearded Manakin can





Newly hatched manakins are pink-skinned with a sparse covering of grey down. They are fed with insects and small fruit, many of which are carried back in the female's throat and regurgitated on arrival. In the ***Blue-backed Manakin****, as with most members of the family, feeds are relatively infrequent and insects are the commonest item. It is worth remembering that, despite her best efforts, she is statistically unlikely to raise her brood. Breeding success in piprids is exceedingly low. Of a large sample of White-bearded Manakin* (Manacus manacus) *nests, only 19% produced young. Data from other studies are roughly similar, suggesting that predation levels are extremely high. It is certainly a consequence of the heavy nest predation that manakin nests are so small and inconspicuous, and probably a result of this that the clutch has been reduced to two eggs, since the nest can only safely hold a maximum of two well-grown young. Taking this line of thinking further, if clutches are small they can be raised by a single parent, and the male is freed from his family duties. This skewed parental investment promotes female choosiness and intense sexual selection. Thus, heavy predation has probably played a role in driving the evolution of the elaborate behaviour and ornamentation so characteristic of male manakins.*

[*Chiroxiphia pareola pareola*,
Alagoas, Brazil.
Photos: Anita Studer]



*The **Yellow-headed Manakin** is patchily distributed along the slopes of the Andes in Colombia and Ecuador. In general, it seems uncommon or rare, although this may have more to do with its behaviour than its true status. It is an inconspicuous understorey bird, easily overlooked, and it is probably commoner than records suggest. Nevertheless, its preferred moderate-elevation habitat is suffering intense pressure from agricultural expansion and settlement. It is currently treated as Near-threatened, but further surveys are required, perhaps using mist-nets, to gain a clearer picture of its distribution and abundance.*

[*Chloropipo flavicapilla*. Photo: John S. Dunning/ Ardea]

be less than a metre above ground and clearly visible from below. Presumably, potential predators are not attracted in this way.

Be that as it may, nesting success of all piprid species studied is very low. The following figures take into account only nests located before the clutch was complete, as those found later are biased in favour of success. In terms of percentages of nests that yielded at least one fledged young, the success rate for 23 Orange-collared Manakin nests was 13% and that for 227 nests of White-bearded Manakins was 19%. For *Pipra* species, the higher nests of which are more difficult to find, extremely low success has been recorded; of eight nests of Red-capped Manakins and seven of Golden-headed Manakins, not one produced any fledglings.

With such low breeding success, followed probably by a considerable post-fledging mortality, about which nothing is known, it follows that, for populations to remain stable, adult survival must be high. This has been found to be so for the four species to which long-term studies have been devoted. Thus, for the White-bearded Manakin in Trinidad an annual survival rate of at least 89% has been recorded, with individual males living for a minimum of 14 years and females for 12·5 years. In the same area, male Golden-headed Manakins were recorded as surviving for at least 11·5 years and females for 12 years.

Movements

The White-ruffed Manakin in Costa Rica breeds in the mountains, mainly at altitudes of 400-900 m, descending to adjacent foothills and lowlands in the non-breeding season, and there is evidence that similar movements are made by the Red-capped and White-crowned Manakins. In Ecuador, the Club-winged Manakin apparently makes similar elevational displacements. No other manakin is known to undertake seasonal migratory movements of any kind. Indeed, those species that have been investigated in detail have been found to be highly sedentary. For example, in a Trinidad population of White-bearded Manakins studied intensively for 3·5 years, a colour-ringed male was seen while foraging about 800 m from where it had first been trapped, and three colour-ringed females were found nesting at about the same distance from the ringing site; these were the longest movements recorded. Except for the moulting period, most adults, at least, spent the whole time within very restricted areas. During the moult, when the display grounds were largely abandoned, systematic trapping indicated that some individuals wandered farther, since a considerable proportion of adults trapped at that time were never recorded again. Trapping of Golden-headed Manakins in the same area produced similar results.

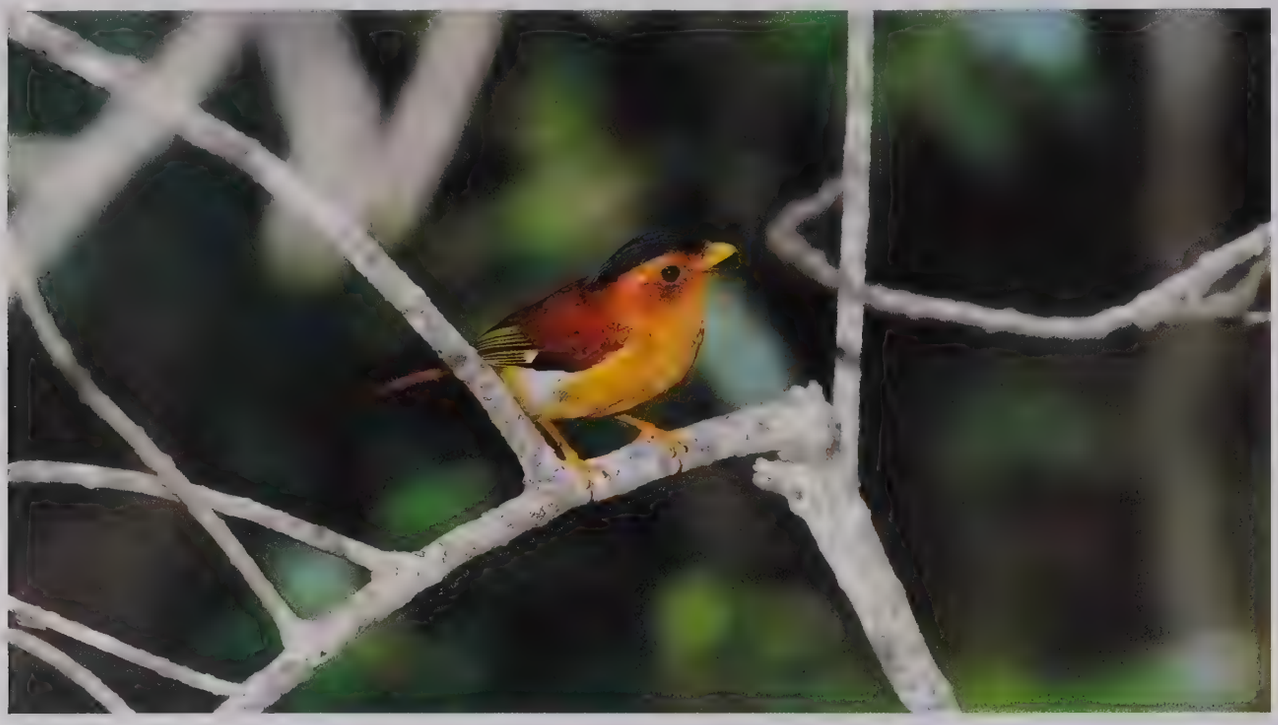
Established males at display grounds, in particular, are extremely sedentary for much of the year. Male White-bearded Manakins were recorded as spending up to 90% of the daylight hours at their courts, making only brief excursions, nearly all less than 5 minutes in duration, in order to forage at nearby fruit sources, with a slightly longer absence in the late afternoon to bathe in a stream close by. Similarly, a male Golden-headed Manakin, watched throughout the day, was present on his display perch for 88% of the time; he made brief foraging excursions and, in the afternoon, one longer one, of 5 minutes, during which he bathed. A male Pin-tailed Manakin in south-east Brazil was observed throughout the hours of daylight, and was found to be present in his display territory for 87% of the period.

These findings have been confirmed and much amplified by the results of radio-tracking experiments by Théry in French Guiana, involving five manakin species. For four species of typical piprid, the Golden-headed, White-fronted, White-crowned and White-bearded Manakins, the home ranges of adult males during the breeding season were very restricted, from 2·1 ha to 3·4 ha, and included the individual bird's display area and one bathing site. The home ranges of females were more extensive, from 8·8 ha to 14·4 ha, and contained several display areas and bathing sites, and those of immature males were larger still, from 18·7 ha to 24·1 ha. Outside the breeding season, they all used much wider areas; radio-tracking over short periods indicated ranges of 30-32 ha, and these would probably have extended to several hundred hectares if the tracking had continued for long periods.

The fifth species tracked, the Thrush-like Mourner, was found to have much larger home ranges than those of the four typical manakins during the breeding season. The figures for two males were 14·3 ha and 16·5 ha, respectively, and the home range of one female was 20·1 ha. Thrush-like Mourners are more insectivorous than the typical manakins; the males have no fixed display area but give their advertising calls while on the move, as they forage through the forest undergrowth.

Relationship with Man

The native Americans of Amazonia and other areas of humid forest could hardly fail to be familiar with many manakin spe-



*The **Black-capped Piprites** is an unusual manakin restricted to the Atlantic Forest. There are records from Minas Gerais south to Rio Grande do Sul, and it has even been seen far inland in Misiones, Argentina. However, it has always been scarce and unevenly distributed. Also, suitable habitat has been heavily fragmented, and its overall numbers must have declined. For these reasons it is classed as Vulnerable. Fortunately, it occurs at some well-protected sites, such as Itatiaia National Park, where it is fairly common.*

[*Piprites pileata*, Campos do Jordão, São Paulo, Brazil. Photo: Edson Endrigo]

cies, especially those with conspicuous displays. In Amazonian Brazil, the brightly coloured *Pipra* species are associated with a variety of legends, superstitions and witchcraft. Dried skins, as well as whole birds preserved in alcohol, are used as charms, talismans and amulets. No doubt there were many local names for the different species. The word *manaquim*, from which *Manacus* and the English vernacular "manakin" are derived, may be a transliteration of an indigenous name used in the upper Amazon.

More recently, the amazing co-operative "dancing" displays of the blue-backed *Chiroxiphia* manakins became familiar enough to the Spanish and Portuguese settlers to earn the name *bailador* for the Long-tailed Manakin and *dançador* for the Blue Manakin. In Trinidad, where the White-bearded Manakin is especially abundant and its leks, with wing-snapping birds leaping to and fro between vertical stems close to the ground, often near forest paths, can hardly be missed, it is known to country people as the "stick-man".

Status and Conservation

In many Neotropical forest areas, manakins are among the most abundant birds of the forest understorey. Thus, in three years of mist-netting in French Guiana, the area's seven species of manakin made up one third of all birds trapped, and in 3·5 years of mist-netting in Trinidad the number of manakins trapped, of two species, far exceeded the combined total for eleven species of tyrant-flycatcher of the forest understorey. The efficiency of manakins as dispersers of the main fruits on which they feed (see Food and Feeding) is probably a main reason for their general abundance. A few species, however, are unaccountably scarce or local.

Of the 58 piprid species currently recognized, four are considered to be globally threatened and a further one could potentially join that category. The species most at risk is the Araripe Manakin (*Antilophia bokermanni*), the conservation status of which is listed as Critical. This little-known species, the handsome male sporting a plumage of white, black and red, is confined to an extremely tiny range in north-east Brazil. It was first discovered as recently as 1996, in the foothills of the Chapada do Araripe, in south-east Ceará, and has not been found anywhere away from the type locality. Its known range, therefore, covers no more than about 1 km². Although there is hope that it may be present elsewhere in nearby foothills, it has not yet been found there, despite searches having been carried out in the region. The total population, of fewer than 250 individuals, lives in tall secondary forest in the Araripe National Forest, which is encompassed within a large Environmental Protection Area, but legal protection is minimal. Lowland areas adjacent to the species' habitat have already been cleared for commercial plantations, farmsteads and human settlement, and associated developments, including road-building and the construction of recreational facilities, constitute a major threat. Unless effective protection of this manakin's habitat is achieved, its future prospects appear bleak. Even in the event of additional populations of the Araripe Manakin being located in nearby forest, there is no guarantee that these could be safeguarded.

Farther south, in the lowland forests of south-east Brazil, Wied's Tyrant-manakin (*Neopelma aurifrons*) has similarly suffered from extensive loss of habitat and is now classified as Endangered. It has been found at a number of localities from Bahia south to Rio de Janeiro, but there are very few records since 1990. The species was formerly treated as conspecific with the Serra Tyrant-manakin (*Neopelma chrysolophum*), which may have obscured its true status. Nevertheless, it appears certainly to have been more widespread in the past in Bahia and Minas Gerais, in both of which states it has not been seen for some years. It was present in Chapada Diamantina National Park, in Bahia, but was last recorded there in 1990. In Espírito Santo, it was uncommon in Sooretama Biological Reserve in 1981 and



*The **Golden-crowned Manakin** is extremely poorly known. After its discovery in 1957 on the upper River Cururu-ri in Pará, Brazil, it went unrecorded until May 2002, when it was found 200 km away. Further surveys are urgently required to clarify its range and status, and to formulate an effective programme of conservation action, if required.*

[*Lepidothrix vilasboasi*, Consorcio Jamanxim, Novo Progresso, Pará, Brazil. Photo: Fabio Olmos]



*In 1996, the Chapada do Araripe played host to one of the most staggering ornithological discoveries of recent times. The **Araripe Manakin** is not a cryptic species, and only evaded detection so long because its entire global range is very small (roughly 1 km²). With a tiny population, and shrinking habitat, the species is classified as Critical. If conservation action is not implemented urgently, the prospects for its survival seem bleak.*

[*Antilophia bokermanni*, Barbalha, Chapada do Araripe, Ceará, Brazil. Photo: Edson Endrigo]

has been seen there only once since, and it occurs locally within Augusto Ruschi Biological Reserve. Otherwise, Wied's Tyrant-manakin is known from a single locality in the state of Rio de Janeiro, and one target of conservationists is to achieve full and effective protection for this forest, situated north-east of the city of Rio de Janeiro itself.

Two piprids are categorized as Vulnerable. These are the Golden-crowned Manakin (*Lepidothrix vilasboasi*) and the Black-capped Piprites (*Piprites pileata*), both of which, as the two other threatened species, are Brazilian, although the latter has been recorded once in north-east Argentina. The Golden-crowned Manakin is so little known that it is difficult to say anything definite about possible threats to its survival. It has been seen only in south-west Pará. The type locality, where the species was discovered by H. Sick in 1957, is on the upper River Cururu-ri, a tributary of the River Teles Pires. It lies within an area of 400,000 ha belonging to the Brazilian air force; here, access is limited and there is no logging. The manakin had not been seen again since its initial discovery, until, in May 2002, it was rediscovered at Consórcio Jamunxim, 200 km north-east of the type locality. This second site, however, is under pressure from an increasing human population and the planned paving of the Cuiabá-Santarém road, which traverses the region. Clearly, fieldwork is needed in order to determine the species' current status and distribution. It seems that the earlier failure of ornithologists to relocate this manakin was probably the result of some confusion over its precise type locality. There are two right-bank tributaries of the Teles Pires bearing the name Cururu. The original specimens were found on the Cururu-ri (often referred to simply as Cururu), which flows north-west, but a better-known river is the Cururu-açu, farther south, which flows south-west to join the main Teles Pires.

The other Vulnerable member of the family, the Black-capped Piprites, has apparently always been rare and local, but it has evidently become more so in recent years, especially in the south of its range, where the *Araucaria* forest in which it occurred has been extensively destroyed. It is restricted to south-east Brazil, from Minas Gerais and Rio de Janeiro south to Rio Grande do Sul, and there is a single record from extreme north-east Argentina, where an individual was caught in September 1959. Although very sparsely distributed and certainly rare, this species does occur in several protected areas in Brazil, including Itatiaia, Serra da Bocaína and Aparados da Serra National Parks and Campos do Jordão State Park. Rumours of its presence in Iguazú National Park, in Argentina, have never been substantiated. It appears to prefer montane forest, which is not at so great a risk of being cleared as are forests in the lowlands, and its prospects for survival should, therefore, be reasonably secure, at least in the short term.

In addition to these four threatened piprids, one other, the Yellow-headed Manakin (*Chloropipo flavicapilla*), is currently considered Near-threatened. This species, patchily distributed in montane forest and mature second growth in the Andes of Colombia and Ecuador, is generally uncommon to rare. There are few recent records, although it is an inconspicuous bird and may have been overlooked. Much of the range within which the Yellow-headed Manakin occurs consists of potentially good-quality agricultural land, and a good deal of its habitat has already been lost as a consequence. It is desirable that the precise status of this manakin be established by means of further fieldwork and research, and any possible changes in its circumstances should be closely monitored.

Finally, two members of the family with rather limited ranges, the Opal-crowned Manakin (*Lepidothrix iris*) of Brazil and the Grey-headed Piprites (*Piprites griseiceps*) of Central America, were formerly included in the category of Near-threatened. Both had suffered habitat loss as a result of forest clearance, but recent work suggests that there is no longer any reason for immediate concern over their conservation status.

In general, the future conservation of manakins, as that of many other Neotropical birds, will depend on the effective protection of adequate areas of forest. Because of their small size, enabling populations to be maintained within relatively small areas, and because many species occur in mature secondary woodland as well as in primary forest, the prospects for the manakins should be better than those of larger and ecologically more specialized forest birds.

General Bibliography

Álvarez (2000, 2001), Bierregaard (1988), Birdsley (2002), Blake & Loiselle (2002), Bock (1994), Bostwick (1998, 2002a, 2002b), Brumfield & Braun (2001), Bucher & Worthington (1982), Cracraft (1981), Endler & Théry (1996), Foster (1991), Graves (1993), Haffer (1974), Hilty (1994), Irestedt *et al.* (2001), Johansson *et al.* (2002), Lanyon, S.M. (1985), Lill (1974, 1975), McDonald (1989a, 1989b, 1993b), McDonald & Potts (1994), Miller (1908), Mobley & Prum (1995), Prum (1990a, 1990b, 1992, 1994a, 1997, 1998, 2000), Prum & Lanyon (1989), Read (1994), Sibley (1996), Sibley & Ahlquist (1990), Sibley & Monroe (1990, 1993), Sibley *et al.* (1988), Sick (1967), Snow, D.W. (1962a, 1963c, 1975a, 1976a, 1977b, 1985c), Snow, D.W. & Lill (1974), Théry (1990b, 1990c), Traylor (1979a), Walther (2004), Whitney *et al.* (1995), Willis (1984), Worthington (1982a, 1989).



PLATE 10

inches 4

cm 10

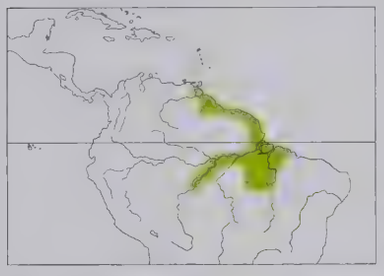
Genus *PIPRA* Linnaeus, 1764

1. Crimson-hooded Manakin

Pipra aureola

French: Manakin auréole **German**: Rothaubenpipra **Spanish**: Saltarín Cabecinaranja
Other common names: Anomalous Manakin ("*P. anomala*")

Taxonomy. [*Parus*] *Aureola* Linnaeus, 1758, "some part of South America, near the equinoctial line" = Surinam.
Closely related to, and forming a superspecies with, *P. fasciicauda* and *P. filicauda*, all three replacing each other geographically. "*P. heterocerca*" is hybrid between present species and *P. filicauda*. Has apparently hybridized also with *Heterocercus linteatus* (hybrid form described as "*Pipra anomala*"). Four subspecies recognized.
Subspecies and Distribution.
P. a. aureola (Linnaeus, 1758) - E Venezuela, the Guianas and NE Brazil.
P. a. flavicollis P. L. Sclater, 1851 - middle Amazon region of Brazil.
P. a. aurantiicollis Todd, 1925 - lower middle Amazon region in W Pará (Brazil).
P. a. borbae J. T. Zimmer, 1936 - along R Madeira, in Brazil.



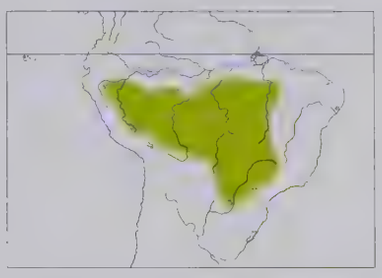
Descriptive notes. 11 cm; 14-18·5 g. Male nominate race has orange-yellow on face and throat; otherwise, foreparts to upper mantle and lower breast crimson; rest of plumage black, except for creamy to whitish thighs and some reddish or orange on vent; barbs of secondaries stiff and shafts thickened; iris white or whitish; bill blackish, paler grey below, and palest along cutting edges; legs pink or purplish-pink. Differs from *P. fasciicauda* in more extensively crimson foreparts, mainly black belly and vent, lack of white in tail. Female is dull olive-green, yellowish-tinged on lores, throat and in diffuse streaks on breast; greyer below, palest on belly; iris pale grey. Immature male resembles female, but iris dark. Races vary mainly in width and definition of yellow frontal band; *flavicollis* differs from nominate in having yellow frontal band narrow and more clearly demarcated from crown, yellow extending farther down throat; *borbae* differs from previous in yellow on forehead being much broader, extending farther back and merging with red of crown, tail shorter; *aurantiicollis* has very narrow yellow frontal band not sharply defined, rather deep yellow throat. Voice. Main call of male a plaintive, somewhat drawn-out "eeeeew", also sharper, double "chee-weep". In flight display male makes two wing noises, a soft "poop" at lowest point of flight, and a click on landing.
Habitat. Swampy and seasonally flooded forest (*várzea*), tangled woodland along watercourses, undergrowth of secondary forest, locally mangroves; also white-sand *campina* forest in Brazil (Amapá). Mostly below 300 m; at 1200 m near Cerro Roraima, in Venezuela.
Food and Feeding. Small fruits, especially of species of Araceae, also insects and spiders. Items plucked or snatched in aerial sallies from nearby perch.
Breeding. Egg-laying in Feb-Mar in Guyana, Oct and Mar-May in Surinam and Oct-May in French Guiana. Male performs complex lek display with others, with co-ordinated alternating display-flights; only dominant (older) male mates with visiting females. Nest a small open cup slung in fork of shrub, c. 1 m above ground. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident; dominant males sedentary.
Status and Conservation. Not globally threatened. Rather uncommon over much of range; locally abundant in Guianan coastal areas.
Bibliography. Bangs & Penard (1918), Colorado & Pulgarín (2003), Cracraft (1985), Forrester (1993), Graves (1981), Haffer (1997b, 2002), Haverschmidt (1965, 1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Le Maitre & Reynaud (1994), Meyer de Schauensee (1982), Novaes (1978a), Ouellet (1990), Reynaud (1998), Ridgely & Tudor (1994), Robbins (1983), Schubart *et al.* (1965), Sick (1993, 1997), Snow (1963a), Snyder (1966), Stotz *et al.* (1996), Tostain (1988b), Tostain *et al.* (1992).

2. Band-tailed Manakin

Pipra fasciicauda

French: Manakin à queue barrée **German**: Schwanzbindenpipra **Spanish**: Saltarín Naranja

Taxonomy. *Pipra fasciicauda* Hellmayr, 1906, Guarayos, Santa Cruz, Bolivia.
Closely related to, and forming a superspecies with, *P. aureola* and *P. filicauda*, all three replacing each other geographically. Five subspecies recognized.
Subspecies and Distribution.
P. f. saturata J. T. Zimmer, 1936 - tropical zone of N Peru E of Andes (in San Martín).
P. f. purusiana Snethlage, 1907 - E Peru S of Amazon (Loreto S to Cuzco) and W Brazil (Acre, and upper R Purús in Amazonas).
P. f. fasciicauda Hellmayr, 1906 - SE Peru (N Puno) and N & NE Bolivia (near Andes in Cochabamba and N Santa Cruz).
P. f. calamae Hellmayr, 1910 - WC Brazil (limited area near upper R Madeira and extreme NW Mato Grosso).
P. f. scarlatina Hellmayr, 1915 - interior Brazil from C Pará (S of Belém area) S to Mato Grosso do Sul, S Goiás, W Minas Gerais and NW São Paulo, with apparently isolated populations in NE (Ceará and Alagoas), and extreme N Bolivia (Pando, Beni), SE Paraguay and extreme NE Argentina (Misiones).
Descriptive notes. 11 cm; 11·5-19 g. Male nominate race has red forebody with some yellow admixed on breast; much yellower on face and throat, light creamy yellow on rest of underparts; rest of plumage black, except for white tail base, white patch on inner webs of flight-feathers (white wingstripe in flight); barbs of secondaries stiff and shafts thickened; iris white or nearly so; bill blackish, paler grey below, palest along cutting edges; legs dull reddish, greyer and sootier on feet. Differs from *P. aureola* in having more yellow and less red on foreparts, paler underparts, white tail base. Female is dull olive-green, tinged yellow on parts of face and breast, greyer below, belly palest, iris pale grey or magenta to whitish; almost indistinguishable from female *P. aureola*, perhaps very slightly more yellowish-green above and very slightly more yellowish on belly. Immature male resembles female, has iris brown or grey. Races vary mainly in degree of scarlet staining on breast, least developed in nominate, noticeably deeper and extending farther over plumage in *scarlatina*, deepest and most extensive (reaching to lower belly) in *saturata*. Voice. Male advertisement call a downward-inflected "eeew"; display call a somewhat harsh "wee-ee-eeh"; in flight display a prolonged "eeeooo", also two wing noises, i.e. a very low-pitched "kloop" in descending part and a sharp "klok" at end of flight.



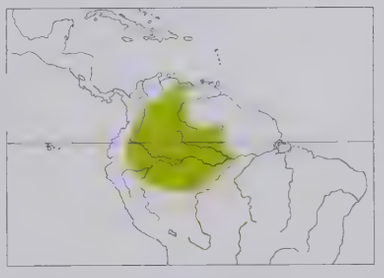
Habitat. Seasonally flooded lowland forest (*várzea*) and gallery forest; to 600 m in Peru. Of 50 individuals mist-netted during study in S Brazil (Mato Grosso do Sul), most were in *cerradão* and gallery forest.
Food and Feeding. Small fruits (Melastomataceae, Rubiaceae) and insects. In study in S Brazil (Mato Grosso do Sul), 93% of faecal samples contained fruits or seeds and 7% insect remains. Items plucked or snatched from vegetation in flight. Has been observed to follow army ants (*Eciton burchelli*) for brief period.
Breeding. In Brazil, egg-laying in Dec in N (Belém area) and species breeds mainly Aug-Nov in S (E Mato Grosso do Sul). Male performs complex lek display with others, with co-ordinated alternating display-flights; yellow vent conspicuously exhibited in courtship; only dominant (older) male mates with visiting females. Nest a tiny cup of fungal rhizomorphs on base of dead leaves, 2-3 m up in fork of small tree. Clutch 2 eggs; no information available on incubation and fledging periods.
Movements. None reliably reported.
Status and Conservation. Not globally threatened. Fairly common to common in most of range; present in several protected areas, e.g. Chapada dos Guimarães National Park (Brazil) and Noel Kempff Mercado National Park (Bolivia). Survival of the undoubtedly small, apparently isolated populations in NE Brazil (Ceará and Alagoas) must be uncertain, in view of deforestation and desiccation of that region; occurs in Serra do Baturité State Environmental Protection Area, in Ceará.
Bibliography. Allen (1995), Angehr & Aucca (1997), Bates & Parker (1998), Brooks *et al.* (1993), Canevari *et al.* (1991), Capper *et al.* (2000), Chebez (1994), Chebez *et al.* (1999), Davis (1993), Dubs (1992), Foster (1985), Fraga & Narosky (1985), Graves (1981), Haffer (1971, 1997b, 2002), Hayes (1995), Hellmayr (1929), Lowen *et al.* (1996), Mazar Barnett & Pearman (2001), Mello & Piratelli (1997), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Oniki & Willis (1983a), Oren & Parker (1997), de la Peña (1989), Pichorim *et al.* (2000), Piratelli & Mello (2001), Ridgely & Tudor (1994), Robbins (1983, 1985), Robinson & Terborgh (1997), Saibene *et al.* (1996), Schulenberg *et al.* (2001), Sick (1960, 1993, 1997), de Souza (2000), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Terborgh *et al.* (1984).

3. Wire-tailed Manakin

Pipra filicauda

French: Manakin filifère **German**: Fadenpipra **Spanish**: Saltarín Uirapuru

Taxonomy. *Pipra filicauda* Spix, 1825, São Paulo de Olivença, River Solimões, west Amazonas, Brazil.
Was for long placed in monotypic genus *Teleonema* on basis of highly modified tail feathers. Closely related to, and forming a superspecies with, *P. aureola* and *P. fasciicauda*, all three replacing each other geographically. "*P. heterocerca*" is hybrid between present species and *P. aureola*. Race *subpallida* apparently intergrades with nominate around Colombia-Ecuador border. Two subspecies recognized.
Subspecies and Distribution.
P. f. subpallida (Todd, 1928) - E Colombia (E of Andes) and NW Venezuela (E, on both sides of Andes, to Miranda).
P. f. filicauda Spix, 1825 - S Venezuela (S & W Amazonas), NW & C Brazil (E to mouth of R Negro, S to headwaters of R Juruá and middle R Purus), E Ecuador and NE Peru (S to middle R Ucayali).



Descriptive notes. 11·5 cm, exclusive of tail filaments (which c. 4 cm long on male, 2·5 cm on female); mean 13·9 g. Male has yellow forecrown, face and underparts, bright red crown to upper mantle and side of neck; rest of upperparts, including wings and tail, black; secondaries with barbs stiffened and shafts thickened, rectrices with long curved filaments; underwing-coverts black; iris white or nearly so; bill blackish, paler along cutting edges; legs sooty reddish. Female is dull olive-green, tinged yellow on face and breast, greyer below, belly palest; very similar to female *P. fasciicauda*, but larger, has tail filaments, and is slightly brighter yellow on throat and belly. Immature resembles female, but has brown iris; at more advanced stage of immature plumage, male has brighter yellow underparts, yellowish frontal band, white iris. Race *subpallida* is very like nominate but slightly paler. Voice. Male advertisement call a downward-inflected "eeew". Two wing noises in courtship: a very low-pitched "kloop" in descending part of display-flight and a sharp "klok" at end of flight.

On following pages: 4. Golden-headed Manakin (*Pipra erythrocephala*); 5. Red-headed Manakin (*Pipra rubrocapilla*); 6. Red-capped Manakin (*Pipra mentalis*); 7. Round-tailed Manakin (*Pipra chloromeros*); 8. Scarlet-horned Manakin (*Pipra cornuta*).

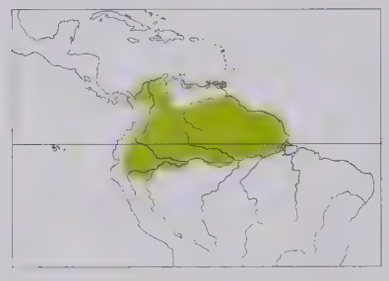
Habitat. Gallery forest, second growth, and lighter open woodlands, including cocoa plantations in Venezuela; in all habitats often near streams. Mostly below 300 m, but to 500 m in Peru and 750 m in Ecuador; to 1000 m N of R Orinoco (Venezuela).
Food and Feeding. Small fruits and insects. Food items plucked or snatched in flight.
Breeding. Nesting in progress in May-Jun in N Venezuela. Male performs complex lek display with others, with co-ordinated alternating display-flights; elongated tail filaments used as tactile organs in courtship; only dominant (older) male mates with visiting females. Nest a small cup slung in horizontal fork of small tree or shrub, mainly 2-4 m above ground, frequently in vegetation bordering or overhanging a stream. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Locally common in suitable habitat. Despite fairly wide habitat tolerance, is patchily distributed in N Venezuela, but occurs there in Henri Pittier and Guatopo National Parks. Elsewhere present in several protected areas, e.g. Amacayacu National Park (Colombia) and Cuyabeno Reserve (Ecuador).
Bibliography. Best *et al.* (1997), Butler (1979), Friedmann (1948), Graves (1981, 1993), Haffer (1997b, 2002), Heindl (2002), Heindl & Winkler (2002, 2003a, 2003b), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Iafrancesco *et al.* (1987), Meyer de Schauensee (1982), Ortiz & Carrión (1991), Pearson & Belebsky (2000), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robbins (1983), Schubart *et al.* (1965), Schwartz & Snow (1979), Sick (1993, 1997), Snow (1975a), Stotz *et al.* (1996).

4. Golden-headed Manakin

Pipra erythrocephala

French: Manakin à tête d'or **German**: Gelbkopfpipra **Spanish**: Saltarín Cabecidorado
Other common names: Yellow-thighed Manakin

Taxonomy. [*Parus*] *erythrocephalus* Linnaeus, 1758, Surinam.
May form a superspecies with *P. rubrocapilla* and *P. mentalis*; has been considered conspecific with former, but the two occur sympatrically in NE Peru (along R Ucayali and lower R Huallaga). Birds from E Colombia sometimes separated as race *flammiceps*, but considered indistinguishable from *berlepschi*. Two subspecies recognized.
Subspecies and Distribution.
P. e. erythrocephala (Linnaeus, 1758) - E Panama, NW, NC & NE Colombia, Venezuela, Trinidad, the Guianas, and N Brazil (N of middle and lower Amazon).
P. e. berlepschi Ridgway, 1906 - S & E Colombia, E Ecuador, NC & NE Peru, and NW Brazil (N of upper Amazon).



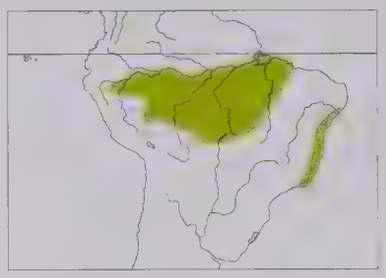
Descriptive notes. 8-9 cm; male average 12·8 g (Trinidad), 11·1 g (Surinam) and 11·8 g (French Guiana), female average 14·1 g (Trinidad), 12·5 g (Surinam) and 12·6 g (French Guiana). Male nominate race has orange-yellow head from forehead and malar area to hindneck, yellow very indistinctly outlined in red; rest of plumage black, except for red and white thigh feathers; iris white; bill pale yellowish to greyish-white; legs brownish flesh. Female is dull olive-green, paler below, especially on belly, which has slight yellowish wash; iris usually grey, sometimes with variable amount of white. Juvenile resembles female, but eyes grey; young male often acquires some adult feathers in first moult (after a few months), at next moult gains full adult plumage. Race *berlepschi* has yellower crown, with narrower and more sharply defined red border, than nominate. Voice. Main call of male on display-perch 3-4 syllables, a clear note followed by trill, ending in one or two sharp notes, "pu prrrrrr-pt(pt)"; also short, sharp "zit, zit". In display-flight to perch, accelerating series of "kew" notes, followed by sharp buzz on landing.
Habitat. Forest and secondary woodland, both humid and partly deciduous; mostly low to middle altitudes, locally to 2000 m.
Food and Feeding. Small fruits and arthropods. In 4-year study in small area of forest in Trinidad, fruits of 43 plant species recorded as taken, by far the most important being the small berries of the melastomataceous genus *Miconia*; in French Guiana Melastomataceae also most important plant family, followed by Rubiaceae. Fruits plucked in flight, swallowed on landing. Small insects and spiders snatched in flight from twigs and foliage.
Breeding. Egg-laying in Jan-Aug, mostly Mar-Jul (end of dry season and beginning of wet season), in Trinidad; from Nov (at start of rains) in Surinam, and in Mar-Jul (during main rainy season) in French Guiana. Male has complex lek display with others, each on separate perch, posture and movements highly stereotyped and diverse, consisting of five elements, including rapid flights with "about-face" on landing; red and white thigh feathers exhibited conspicuously. Nest a small shallow cup thinly woven from vegetable fibres, dead leaf petioles and rootlets, lined with black fungal strands (*Marasmius*), often with few dead leaves attached to sides of cup and hanging from underside, attached by cobweb, slung in fork between horizontal twigs of sapling, shrub or lower branches of tree, 1·5-10 m above ground. Clutch 2 eggs; incubation 16-17 days; fledging period not documented. Nesting success evidently low; of seven nests found in Trinidad during laying or incubation, none survived to fledging stage.
Movements. Resident. In radio-tracking study in French Guiana, adults sedentary when breeding, moving over larger area (probably of several hundred hectares) during moult period; an immature male wandered over range of 22·7 ha.
Status and Conservation. Not globally threatened. Fairly common to common generally; in many areas one of the most abundant of all forest bird species. In 100-ha Trinidad study area, total of 625 individuals trapped over period of 3 years and 3 months. In French Guiana during breeding season, home ranges of two adult males were 3 ha and 3·4 ha (centred on single display area and bathing site), and of two females 12·8 ha and 14·4 ha (including several male display areas and bathing sites). Present in numerous protected areas, e.g. Darién National Park (Panama), Guatopo National Park (Venezuela) and Asa Wright Nature Centre (Trinidad).
Bibliography. Allen (1961), Bangs & Penard (1918), Best *et al.* (1997), Blake (1950, 1962), Bond *et al.* (1989), Borgia *et al.* (1985), Butler (1979), Canaday & Jost (1997), Capparella (1988), Cohn-Haft *et al.* (1997), Eisenmann (1955), ffrench (1991), Friedmann (1948), Gilliard (1941), Graves (1981), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Heindl & Winkler (2002, 2003a), Hellmayr (1929), Herklots (1961), Hilty (2003), Hilty & Brown (1986), Hudon *et al.* (1989), Iafrancesco *et al.* (1987), Lill (1976), Meyer de Schauensee (1982), Murphy (1995), Ortiz & Carrión (1991), Ouellet (1990), Reynaud (1998), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Schubart *et al.* (1965), Schulenberg *et al.* (2001), Sick (1960, 1993, 1997), Snow (1962b), Snyder (1966), Stotz *et al.* (1996), Théry (1990b, 1990c, 1992, 1997), Tostain *et al.* (1992), Wetmore (1972), Willard *et al.* (1991), Zimmer & Hilty (1997).

5. Red-headed Manakin

Pipra rubrocapilla

French: Manakin à tête rouge **German**: Rotkopfpipra **Spanish**: Saltarín Cabeirrojo Sureño

Taxonomy. *Pipra rubro-capilla* Temminck, 1821, Bahia, Brazil.
May form a superspecies with *P. erythrocephala* and *P. mentalis*; has been considered conspecific with former, but the two occur sympatrically in NE Peru (along R Ucayali and lower R Huallaga). Monotypic.
Distribution. E Peru, Brazil S of Amazon (E to N Maranhão, S to Rondônia and SC Mato Grosso, also disjunct coastal population from Pernambuco S to Rio de Janeiro) and N Bolivia.



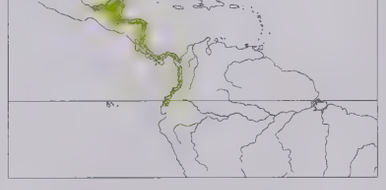
Descriptive notes. 10 cm; male 10·9-13·8 g, female 12·7-16·6 g. Male has red head from forehead and malar area to hindneck, red thighs; rest of plumage black; iris hazel-brown; bill pale brownish; legs dull pinkish. Differs from *P. erythrocephala* in head colour and eye colour, also longer tail; from *P. mentalis* in red thighs, black underwing-coverts. Female is dull olive-green, paler below, especially on belly, iris and bill darker than male's; very similar to female *P. erythrocephala*, perhaps very slightly more yellowish on throat and belly. Juvenile plumage not documented, presumed similar to female. Voice. Main call of male "drree-dit, dree-dee-dew", with variations; other calls include sharp "zit, zit" and in display-flight series of "kew" notes, similar to calls of *P. erythrocephala*.
Habitat. Humid lowland forest and secondary woodland; to 500 m.
Food and Feeding. Small fruits and insects, plucked or snatched in flight.
Breeding. Eggs laid in Sept-Apr in N Brazil (Belém area). Male has complex lek display with others, posture and movements highly stereotyped and diverse, consisting of several elements, including rapid flights with "about-face" on landing; red thigh feathers exhibited conspicuously. Nest 2-5 m above ground. Clutch 2 eggs; incubation period not documented; fledging period 13-14 days.
Movements. No information; almost certainly sedentary.
Status and Conservation. Not globally threatened. Fairly common to common in most of range. Isolated E Brazilian population much reduced by extensive destruction of lowland forest; occurs in Pedra Talhada State Park and in Sooretama Biological Reserve.
Bibliography. Acheson & Davis (2001), Allen (1995), Bates & Parker (1998), Capparella (1988), Castro Astor, Alves & Cavalcanti (2004), Castro Astor, Cavalcanti & Alves (1998), Dubs (1992), Graves (1981), Gyldenstolpe (1950), Hellmayr (1929), Hudon *et al.* (1989), Meyer de Schauensee (1982), Oren & Parker (1997), Parker, Donahue & Schulenberg (1994), Pinto (1953), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1967, 1993, 1997), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tobias *et al.* (1993), Zimmer *et al.* (1997).

6. Red-capped Manakin

Pipra mentalis

French: Manakin à cuisses jaunes **Spanish**: Saltarín Cabeirrojo Norteño
German: Nördliche Gelbhosenpipra
Other common names: Yellow-thighed Manakin

Taxonomy. *Pipra mentalis* P. L. Sclater, 1857, Córdoba, Veracruz, Mexico.
May form a superspecies with *P. erythrocephala* and *P. rubrocapilla*. Three subspecies recognized.
Subspecies and Distribution.
P. m. mentalis P. L. Sclater, 1857 - from SE Mexico (S Veracruz) S, on Caribbean slope, to E Costa Rica.
P. m. ignifera Bangs, 1901 - Panama, mainly on Caribbean side.
P. m. minor Hartert, 1898 - W Colombia and W Ecuador.



Descriptive notes. 10 cm; 12·5-18·5 g. Male has red head from forehead and malar area to hindneck, creamy yellow thighs; rest of plumage mostly black; secondaries enlarged, curved and stiffened, with thick shafts; underwing-coverts yellow; iris white; bill brownish, darker and greyer above, paler horn below; legs dull reddish to lead-grey. Differs from very similar *P. rubrocapilla* in yellow thighs and yellow underwing-coverts. Female is dull olive-green, paler below, especially on belly, iris dull brown or, rarely, white; very similar to female *P. rubrocapilla* but perhaps very slightly duller below. Immature is like adult female; immature male at advanced stage has white iris and usually some adult feathers on head and body. Race *ignifera* male has red and yellow colours deeper and black more intense than nominate; *minor* is smaller. Voice. Main call of male a short, explosive "psip", often preceded by high, thin "p'tsweeeeee"; full call in display "psit psit psit p'tsweeee psip", final note sharp and emphatic. Display also accompanied by wing-snaps.
Habitat. Humid forest and mature secondary woodland, mostly below 500 m; to 750 m in Mexico.
Food and Feeding. Chiefly small fruits and insects, taken in rapid aerial sally. Sometimes joins mixed-species parties following army ants.
Breeding. Eggs laid in Mar-Jun in Costa Rica, Feb-Jul in Panama. Male has complex lek display with others, posture and movements highly stereotyped and diverse, consisting of several elements, including rapid flights with "about-face" on landing; yellow thighs and underwing-coverts exhibited conspicuously. Nest a small cup mainly of vegetable fibres, sometimes with black fungal filaments as lining, and variable number of leaf fragments hanging below, suspended c. 1·5-9 m above ground in horizontal fork of shrub, sapling or small tree, bound to supporting arms by cobweb. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Generally sedentary. In Costa Rica, probably some regular movement to lower altitudes in non-breeding season; no other information.

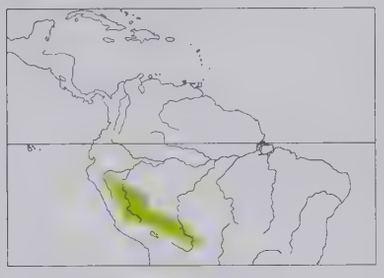
Status and Conservation. Not globally threatened. Common to fairly common where lowland forest remains; often rather local in occurrence. Numbers in W Ecuador have declined severely as a result of extensive deforestation in lowlands, but species is still very common in NW.
Bibliography. Bangs (1903), Bartholomew *et al.* (1983), Best *et al.* (1997), Binford (1989), Blake & Loiselle (2002), Bostwick & Prum (2003), Brodkorb (1943), Butler (1979), Cracraft (1985), Dearborn (1907), Eisenmann (1955), González-García (1993), Graves (1981), Griscom (1950), Haffer (1975), Hellmayr (1929), Herrera-Rosales (1998), Hilty & Brown (1986), Howell & Webb (1995a), Hudon *et al.* (1989), Klaas (1968), Komar & Domínguez (2001), Land (1970), Lee Jones (2004), Levey (1987), Loiselle & Blake (1999), Meyer de Schauensee (1982), Miller (1995), Moermond & Denslow (1985), Monroe (1968), Ortiz & Carrión (1991), Paynter (1955, 1957), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Rutgers & Norris (1977), Selvin & Castillo (2000), Skutch (1967, 1969), Slud (1960, 1964), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Van Tyne (1935), Westcott (1994), Wetmore (1972), Willis & Eisenmann (1979), Worthington (1982a, 1982b, 1983, 1989).

7. Round-tailed Manakin

Pipra chloromeros

French: Manakin à queue ronde **Spanish**: Saltarín Coliancho
German: Südliche Gelbhosenpipra

Taxonomy. *P[ipra] chloromeros* Tschudi, 1844, Vitoc Valley, Junín, Peru.
Monotypic.
Distribution. E Peru (S from S Amazonas and San Martín), adjacent W Brazil (Acre) and N Bolivia.



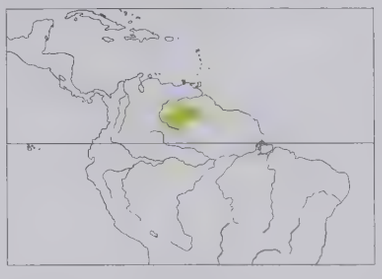
Descriptive notes. 11 cm; 16·5 g. Male has red from forehead and malar area to hindneck, creamy yellow thighs; rest of plumage black; secondaries enlarged, curved and stiffened, with thick shafts; iris white; bill blackish, darker grey on culmen; legs smoky flesh-coloured. Distinguished from very similar *P. mentalis* by black (not yellow) underwing-coverts, rounded tail (not more or less square-cut as in congeners), red nape feathers often somewhat protruding. Female is dull olive-green, paler below, especially on belly, iris greyish; differs from female *P. mentalis* in having rounded tail. Immature is similar to adult female, but iris darker grey. Voice. Full advertisement call of male a multisyllabic "fui-ii-ii-i chi-awaaak", lasting c. 1·7 seconds, most often only second part given; display call a trisyllablic "fi-cuac-cuac", last two elements with buzzing quality, display also accompanied by double wing-snaps.
Habitat. Humid forest, from lowlands to well into Andean foothills; to 1400 m.
Food and Feeding. Few details; diet and foraging behaviour presumably similar to those of congeners.
Breeding. Mainly Aug-Nov in SE Peru. Male displays with others at "exploded" lek, defends territory with diameter of 20-50 m; display elements include, among others, to-and-fro flights between main perch and adjacent ones, rapid "about-face" turns on perch, backward slides, down-and-up swooping flights, various postures, conspicuous exhibiting of yellow thighs. Nest and eggs not documented.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common in quite extensive range, where much forest remains. Present in Tambopata-Candamo Reserved Zone, and in Manu National Park and Biosphere Reserve (Peru).
Bibliography. Allen (1995), Angehr & Aucca (1997), Chapman (1921), Cracraft (1985), Graves (1981), Graves *et al.* (1983), Hellmayr (1929), Hudon *et al.* (1989), Meyer de Schauensee (1982), Parker & Wust (1994), Parker, Donahue & Schulenberg (1994), Parker, Kratter & Wust (1994), Parker, Schulenberg & Wust (1994), Pearson & Beletsky (2001), Perry *et al.* (1997), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Stotz *et al.* (1996), Tello (2001), Terborgh *et al.* (1984), Whittaker & Oren (1999), Zimmer (1930).

8. Scarlet-horned Manakin

Pipra cornuta

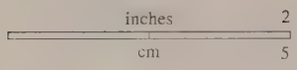
French: Manakin à cornes rouges **German**: Rotschopfpipra **Spanish**: Saltarín Copetón

Taxonomy. *Pipra cornuta* Spix, 1825, "in sylvis flum. Amazonum"; error = Mount Roraima, Venezuela.
Monotypic.
Distribution. Mountains of S Venezuela and adjacent W Guyana (E to Merumé and Potaro Plateau) and extreme N Brazil (upper R Branco).



Descriptive notes. 12·5 cm; 4 adult males average 23·5 g. The largest *Pipra* species, with longer tail than congeners. Male has entire head, including chin and throat, red, feathers of hindcrown elongated to form two slightly upward-curving "horns"; thighs red, rest of plumage black; secondaries enlarged, curved and stiffened, with thick shafts; iris white; bill pale flesh; legs fleshy-coloured or brownish. Female is dull olive-green, paler below, especially on belly, slightly elongated hindcrown feathers giving tufted appearance, iris darker than male's, bill browner. Immature resembles female, eyes dark. Voice. Main advertisement call of male an abrupt trisyllabic "wrrt pit-arrk", lasting c. 1 second; less frequently a double "kerzeek". Explosive wing noise, "prrt", accompanies display.
Habitat. Humid forest and well-grown secondary woodland in highlands, at 500-1800 m.
Food and Feeding. Little information; fruits of Melastomataceae recorded as eaten. Fruits taken in sallying and hovering flights.
Breeding. Not recorded. Male has complex lek display with others, posture and movements stereotyped and diverse, consisting of several elements, including rapid flights with "about-face" on landing, backward "slides" on perch, tail-flicking; red thigh feathers exhibited conspicuously when legs fully stretched.
Movements. Resident; almost certainly sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tepuis EBA. Locally fairly common to common. Much suitable habitat remains within its range, and in many areas forest is still effectively inaccessible to major human intrusions. Present in Canaíma National Park (Venezuela).
Bibliography. Barnett *et al.* (2002), Chapman (1931), Gilliard (1941), Hellmayr (1929), Hilty (2003), Mayr & Phelps (1967), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Rodner *et al.* (2000), Snow, D.W. (1977a), Snyder (1966), Stotz *et al.* (1996), Willard *et al.* (1991).

PLATE 11



ssp *minuscula* ♂

ssp *coronata* ♂ ♀

ssp *isidorei* ♀ ♂

9

10

ssp *leucopygia* ♂

ssp *exquisita* ♂

ssp *velutina* ♂

♀ 11 ♂

ssp *gracilis* ♀

12

ssp *nattereri* ♂

♀

13

♀

ssp *iris* ♀ ♂

14

ssp *eucephala* ♂ ♀

15

♂

♀

♀

16

♂

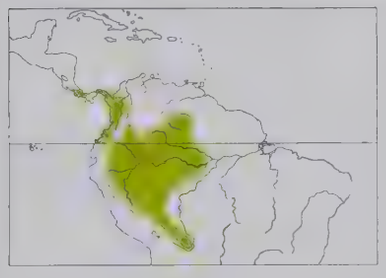
Genus *LEPIDOTHRIX* Bonaparte, 1854

9. Blue-crowned Manakin

Lepidothrix coronata

French: Manakin à tête bleue **German**: Blauscheitelpipra **Spanish**: Saltarín Coroniazul
Other common names: Exquisite Manakin ("*exquisita* group"); Velvety Manakin (*velutina* and *minuscula*)

Taxonomy. *Pipra coronata* Spix, 1825, São Paulo de Olivença, River Solimões, west Amazonas, Brazil.
Genus often merged with *Pipra*. Taxonomy complex and poorly understood: NW populations (*velutina*, *minuscula*) may represent a separate species; populations E of Andes of two distinct types, with males black-bodied in N (*carbonata*, *caquetae*, nominate) and green-bodied in S (*exquisita*, *caelestipileata*, *regalis*), and apparently intermediate populations in W Amazonia (S of Amazon in N Peru and W Brazil). Further research needed. Eight subspecies recognized.
Subspecies and Distribution.
L. c. velutina (Berlepsch, 1883) - Costa Rica (Pacific side, also on Atlantic side in extreme E) and W Panama.
L. c. minuscula (Todd, 1919) - E Panama (E from Canal Zone), NW & NC Colombia (in E, S possibly to S Caldas) and NW Ecuador.
L. c. caquetae (Meyer de Schauensee, 1953) - S Colombia E of Andes (W Meta, W Caquetá).
L. c. carbonata (Todd, 1925) - SC & SE Colombia, S Venezuela, and NE Peru and NW Brazil N of Amazon.
L. c. coronata (Spix, 1825) - E Ecuador, and NE Peru and adjacent extreme W Brazil S of Amazon.
L. c. exquisita (Hellmayr, 1905) - C Peru E of Andes.
L. c. caelestipileata (Goeldi, 1905) - SE Peru and adjacent W Brazil.
L. c. regalis (Bond & Meyer de Schauensee, 1940) - NC Bolivia (Cochabamba).



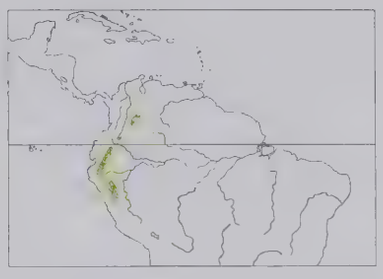
Descriptive notes. 8-9 cm; 8·5 g. Male nominate race has bright blue cap; rest of plumage entirely sooty black; iris rather dark brown-red; bill blackish above, paler grey below; legs greyish. Female is green above, duller green on breast, paler greyish on face and abdomen, the latter slightly tinged yellowish. Juvenile resembles female; immature male has blue crown, sometimes some black feathers in body plumage. Races differ mainly in male plumage coloration or intensity of colour: *caquetae* resembles nominate; *carbonata* differs in having lower belly and undertail-coverts tinged greenish-blue; *velutina* is a deeper and more lustrous black; *minuscula* resembles previous but smaller, with crown deeper blue; *exquisita* is very different, has crown paler blue, black lores, mostly black flight-feathers and tail, green upperparts, throat and chest, pale yellow central breast and belly, white vent; *regalis* differs from last in deeper blue (less silvery) crown, yellower upperparts, duller and less extensive yellow below; *caelestipileata* resembles previous but crown brighter. Voice. Male advertisement call varies geographically, including the following: a soft "tho-wiik" or "chí-wrrr", first note hiccup-like, often preceded by thin high-pitched "wheeeeee"; also a clear trill, "prrrreew"; in courtship "pi pipipipi chu-wáák", last notes nasal and frog-like; at least in Middle America (*velutina*) a musical trill, "treereereereu", by both sexes.
Habitat. Humid forest and mature secondary woodland; to 1400 m, mostly below 1000 m.
Food and Feeding. Largely small fruits; also insects. Items plucked from foliage or twigs in flight. Often joins mixed-species foraging parties.
Breeding. Eggs laid in Feb-Jun (mainly Mar-May) in Costa Rica. Male displays solitarily or at "exploded" lek, from several low slender branches, executes rapid flight manoeuvres. Following details all from Costa Rica. Nest a small cup, attached to support and bound together with cobweb, mainly of fine fibres, bottom more or less covered with dry fragments of leaf and green moss, often some hanging below, mostly 0·6-1·5 m above ground in fork of slender horizontal branch. Clutch 2 eggs; incubation period 17·5 and 19 days (two records); fledging period 13-15 days.
Movements. Little information; probably sedentary.
Status and Conservation. Not globally threatened. Locally common in most of range; fairly common to common in Ecuador and Peru. Easily overlooked.
Bibliography. Capparella (1988), Chapman (1917c), Eisenmann (1955), Graves (1981), Gyldenstolpe (1950), Haffer (1975), Heindl & Winkler (2003a), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Iafrancesco *et al.* (1987), Prum (1988), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), Robinson & Terborgh (1997), Sekercioglu *et al.* (2002), Sick (1993, 1997), Skutch (1969), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz (1993), Stotz *et al.* (1996), Westcott (1994), Wetmore (1972), Zimmer (1930).

10. Blue-rumped Manakin

Lepidothrix isidorei

French: Manakin à dos bleu **German**: Blaubürzelpipra **Spanish**: Saltarín Lomiazul

Taxonomy. *Pipra isidorei* P. L. Sclater, 1852, "Nouvelle-Grenade" [Bogotá] = Buenavista, above Villavicencio, Meta, Colombia.
Genus often merged with *Pipra*. Forms a superspecies with *L. coeruleocapilla*, which it replaces geographically. Race *leucopygia* may be a separate species. Two subspecies currently recognized.
Subspecies and Distribution.
L. i. isidorei (P. L. Sclater, 1852) - E side of E Andes in Colombia (Boyacá, Meta, Cauca) and E Ecuador.
L. i. leucopygia (Hellmayr, 1903) - N Peru on E side of C Andes (San Martín, N Huánuco).



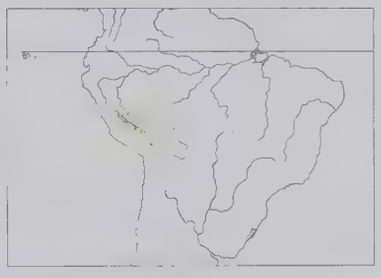
Descriptive notes. 7·5 cm. Male nominate race has shiny white cap, azure-blue rump and uppertail-coverts; rest of plumage black; iris dark brownish-red; bill blackish above, paler grey below; legs greyish. Female is green above, brightest on rump, contrasting with dusky tail, duller green on breast, with pale yellowish-grey face, grey throat and yellowish-grey abdomen; distinguished from extremely similar female *L. coronata* mainly by slightly brighter face, contrasting rump and tail. Juvenile plumage not documented, presumably like female. Race *leucopygia* differs from nominate in having rump and uppertail-coverts milky white, tinged blue at upper and lower edges. Voice. Male display call a rising "kooooit" or "wreee", repeated at intervals of 2-5 seconds.
Habitat. Humid forest in Andean foothills; 500-1700 m.
Food and Feeding. No data; presumed similar to *L. coronata*.
Breeding. Not recorded. Display little known; a solitary male in Ecuador, perched 4-8 m up on thin horizontal branches, seen to raise pale feathers of crown and rump while crouching forwards.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Locally fairly common to uncommon; rare in Peru. Observed less frequently than e.g. *L. coronata*, and seems to call less often; may be somewhat more numerous than it appears to be. In Ecuador, possibly commonest in R Bombuscaro sector of Podocarpus National Park.
Bibliography. Best *et al.* (1997), Bloch *et al.* (1991), Butler (1979), Chapman (1917c), Graves (1981), Hellmayr (1929), Hilty & Brown (1986), Iafrancesco *et al.* (1987), Mazar Barnett & Kirwan (1998b), Meyer de Schauensee (1982), Parker *et al.* (1982), Prum (1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996).

11. Cerulean-capped Manakin

Lepidothrix coeruleocapilla

French: Manakin céruléen **German**: Blaukappenpipra **Spanish**: Saltarín Coroniceleste

Taxonomy. *P[ipra] coeruleo-capilla* Tschudi, 1844, Montañas de Vitoc, Junín, Peru.
Genus often merged with *Pipra*. Forms a superspecies with *L. isidorei*, which it replaces geographically. Monotypic.
Distribution. Upper tropical zone on E slope of Andes of C & SE Peru (S Huánuco S to Puno).



Descriptive notes. 8·5 cm; 9·1 g. Male has bright blue cap, deeper blue rump and uppertail-coverts; rest of plumage black; iris dark brownish-red; bill blackish above, paler grey below; legs greyish. Female is green above, brightest on rump, tail more dusky, duller green on breast, with pale greyish face and throat, yellowish-grey abdomen; distinguished from extremely similar female *L. isidorei* by slightly larger size and longer tail. Juvenile plumage not documented; immature male has small blue spots on crown. Voice. Call a sharp "tee-zeek".
Habitat. Humid forest in foothills, also ridgetop scrub; 500-2100 m.
Food and Feeding. No information; presumably as for *L. coronata*. Occasionally observed at fruiting trees near forest edge.
Breeding. Not recorded.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Peruvian East Andean Foothills EBA. Uncommon to locally quite common. Very poorly known, and often extremely inconspicuous.
Bibliography. Clements & Shany (2001), Cracraft (1985), Mee *et al.* (2002), Meyer de Schauensee (1982), Parker *et al.* (1982), Prum (1988), Ridgely & Tudor (1994), Stotz *et al.* (1996), Walker (2001).

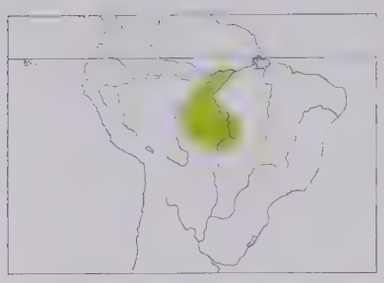
12. Snow-capped Manakin

Lepidothrix nattereri

French: Manakin neigeux **German**: Weißbürzelpipra **Spanish**: Saltarín Coronialbo

Taxonomy. *Pipra nattereri* P. L. Sclater, 1865, Borba, River Madeira, Brazil.
Genus often merged with *Pipra*. Probably a close relative of *L. vilasboasi*. Two subspecies recognized.
Subspecies and Distribution.
L. n. nattereri (P. L. Sclater, 1865) - C Brazil S of middle Amazon (from R Madeira, S to Calama, E to R Tapajós and its affluents).
L. n. gracilis (Hellmayr, 1903) - SC Brazil from upper R Madeira (S of Calama) E to C Mato Grosso (E to upper R Xingu drainage), S to extreme NE Bolivia (NE Santa Cruz).
Descriptive notes. Male 8·5 cm, 8 g; female 9·2 cm, 8·8 g. Male is green above, with contrasting white cap and white lower back to uppertail-coverts; flight-feathers and tail blackish with broad green edgings; chin to breast green, slightly paler and duller than back, belly to undertail-coverts yellow; iris yellowish-white or pale yellow; bill pale bluish; legs pinkish-flesh. Female nominate race is larger than male, has blue crown, green (not white) lower back to uppertail-coverts. Juvenile resembles female, but iris dark; immature male has some white feathers on crown. Race *gracilis* male is like nominate; female differs from nominate in having green crown concolorous with back. Voice. Male call a soft, short "chí-wrrr", very like call of *L. coronata*; more piercing call, a rising "pweeee", also heard given by female or juvenile individual.
Habitat. Humid forest, mainly *terra firme*; to c. 500 m.

On following page: 13. Golden-crowned Manakin (*Lepidothrix vilasboasi*); 14. Opal-crowned Manakin (*Lepidothrix iris*); 15. Orange-bellied Manakin (*Lepidothrix suavissima*); 16. White-fronted Manakin (*Lepidothrix serena*).



Food and Feeding. Small insects and a spider recorded in stomach contents; probably also takes small fruits.
Breeding. Not recorded.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Locally common to uncommon. Poorly known species; known to occur in Amazônia (Tapajós) National Park, in Brazil, and Noel Kempff Mercado National Park, in Bolivia.
Bibliography. Acheson & Davis (2001), Bates & Parker (1998), Dubs (1992), Forrester (1993), Haffer (1997b), Hellmayr (1929), Hennessey, Herzog & Sagot (2003), Meyer de Schauensee (1982), Oren & Parker (1997), Prum (1988), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1993, 1997), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Zimmer *et al.* (1997).

13. Golden-crowned Manakin

Lepidothrix vilasboasi

French: Manakin doré **German**: Gelbscheitelpipra **Spanish**: Saltarín Coronidorado
Other common names: Sick's Manakin ("*L. obscura*")

Taxonomy. *Pipra vilasboasi* Sick, 1959, headwaters of River Cururu-ri, south-west Pará, Brazil.
Genus often merged with *Pipra*. Probably a close relative of *L. nattereri*. Was for some time thought to be possibly a hybrid between that species (which replaces it to W) and *L. iris* (to E), but distinctive plumage characters, coupled with its recent rediscovery c. 200 km NE of type locality, leave little doubt that it is a distinct species. Described taxon *L. obscura* based on two specimens, now believed probably to be female and immature male of present species. Monotypic.
Distribution. SW Pará (upper R Cururu-ri and Consórcio Jamunxim), in C Brazil.



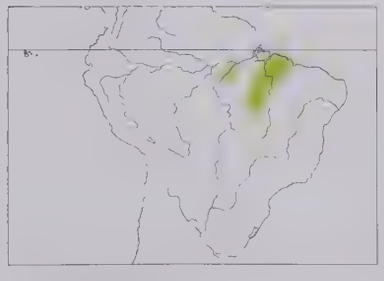
Descriptive notes. 8·5 cm. Male has glittering greenish-gold crown and nape, yellow-green lower back to uppertail-coverts; rest of head and upperparts green, flight-feathers and tail mostly blackish, broadly edged green; chin to breast green, belly to undertail-coverts yellow; iris pale greyish; bill pale bluish; legs pinkish-flesh. Presumed female has golden and yellow colours of upperside replaced by green. Juvenile plumage not documented; presumed immature male like female, but has some greenish-gold on crown. Voice. Male call a burry "prreee", sometimes in series.
Habitat. Humid forest; c. 200 m.
Food and Feeding. Small fruits and insects.
Breeding. Not recorded.
Movements. No information.
Status and Conservation. VULNERABLE. Recorded at only two sites. Until recently known only from type locality, on upper R Cururu-ri (a tributary of R Teles Pires), where not seen since time of discovery, in 1957; in May 2002, however, several individuals were found 200 km NE of there, at Consórcio Jamunxim. Earlier failure of ornithologists to relocate this manakin was probably result of confusion over precise locality (original specimens were found on R Cururu-ri, which flows NW, but a better-known river is the SW-flowing Cururu-açu, farther S). Full range of species unknown, but certainly not very large. Type locality lies within the 400,000-ha Mundurucânia Forest Reserve belonging to the Brazilian air force; here, access is limited and there is no logging. Consórcio Jamunxim is under pressure from increasing human population, as well as from planned paving of Cuiabá-Santarém road, which traverses the region. Fieldwork urgently required with the aim of determining the species' current status and distribution, and the extent of habitat destruction and further threats at its two known sites.
Bibliography. Collar & Andrew (1988), Collar *et al.* (1992), Cracraft (1985), Dinerstein *et al.* (1995), Fernández (2003), Forrester (1993), Haffer (1997a, 1997b), Meyer de Schauensee (1982), Olmos & Pacheco (2002, 2003), Parr (2002), Parrini *et al.* (1999), Prum (1988), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1959, 1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996).

14. Opal-crowned Manakin

Lepidothrix iris

French: Manakin à tête d'opale **German**: Opalscheitelpipra **Spanish**: Saltarín Opalescente
Other common names: Pearl-headed Manakin

Taxonomy. *Pipra iris* Schinz, 1851, "Guyana"; error = Belém, Pará, Brazil.
Genus often merged with *Pipra*. Two subspecies recognized.
Subspecies and Distribution.
L. i. eucephala (Todd, 1928) - SW Pará (right bank of lower R Tapajós), in NC Brazil.
L. i. iris (Schinz, 1851) - E Pará (neighbourhood of Belém) E to NW Maranhão and S to upper R Xingu (Brazil).



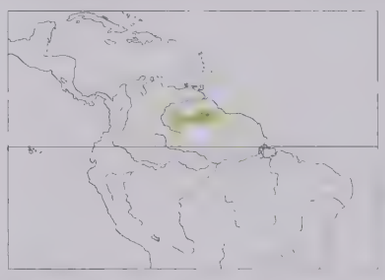
Descriptive notes. 9 cm; female 7·8-9·5 g. Has notably heavy bill. Male nominate race has narrow green band on forehead, and shiny opal-escent crown and nape; plumage otherwise mostly olive-green above and from chin to breast, yellow below; iris pale buff or cream; bill pale bluish; legs pinkish-flesh. Female has crown and nape green. Juvenile resembles female, but iris dark. Race *eucephala* male lacks green on forehead, female has bluish crown and nape. Voice. Male call a rather rapidly repeated "chi-wir".
Habitat. Humid forest and mature secondary woodland; below c. 200 m.
Food and Feeding. No data; probably similar to *L. coronata*.
Breeding. Female with fully formed egg in oviduct, Aug, in E Pará (Belém area). Male displays solitarily or at "exploded" lek, from low slender branches, with rapid flight manoeuvres. No other information.
Movements. No information; presumably resident.
Status and Conservation. Not globally threatened. Formerly considered Near-threatened. Uncommon to locally fairly common. Numbers undoubtedly reduced by deforestation within its limited range. Poorly known species.
Bibliography. Collar *et al.* (1994), Cracraft (1985), Forrester (1993), Haffer (1971, 1997b), Hellmayr (1929), Meyer de Schauensee (1982), Pinto (1953), Prum (1988), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Zimmer *et al.* (1997).

15. Orange-bellied Manakin

Lepidothrix suavissima

French: Manakin à ventre orange **German**: Orangebauchpipra **Spanish**: Saltarín Ventrinaranja
Other common names: Tepui Manakin

Taxonomy. *Pipra suavissima* Salvin and Godman, 1882, Merume Mountains and Bartica, Guyana.
Genus often merged with *Pipra*. Until recently treated as conspecific with *L. serena*, but differs markedly in voice and in syringeal anatomy, as well as in male plumage characters. Monotypic.
Distribution. Montane zone of S & SE Venezuela, NC Guyana, and adjacent extreme N Brazil.



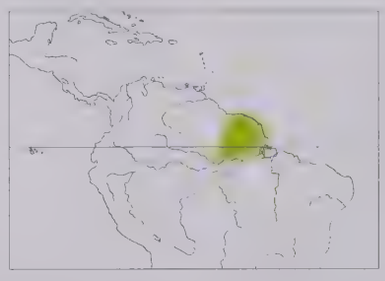
Descriptive notes. 9 cm; 1 male 8·5 g. Male is black with contrasting white forecrown, bright azure-blue lower rump and uppertail-coverts, yellow-orange belly; iris dark brown; bill black; legs greyish to nearly black. Differs from *L. serena* in having belly more orange-coloured (less yellow), no orange-yellow spot on chest. Female is mostly green, with bluish forehead, duller and greyer face and throat, yellow belly and undertail-coverts. Juvenile resembles female; immature male has some black in plumage. Voice. Male call a sharp, nasal, upward-inflected "aank"; also a rapid, emphatic, piping series of 7-8 notes, rising and falling in pitch.
Habitat. Montane forest and forest borders; 500-1800 m, locally down to 250 m.
Food and Feeding. Small fruits and insects, snatched in hovering flight.
Breeding. Not recorded. Male displays solitarily, or occasionally at "exploded" lek, executes bursts of rapid flight manoeuvres from low slender branches.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tepuis EBA. Locally common to fairly common; easily overlooked. Montane forest in much of its range is extensive and mostly difficult of access.
Bibliography. Blake (1950), Chapman (1931), Friedmann (1948), Gilliard (1941), Hellmayr (1929), Hilty (2003), Mayr & Phelps (1967), Prum (1994b), Ridgely & Tudor (1994), Rodner *et al.* (2000), Snyder (1966), Stotz (1993), Stotz *et al.* (1996), Willard *et al.* (1991).

16. White-fronted Manakin

Lepidothrix serena

French: Manakin à front blanc **German**: Weißstirnpipra **Spanish**: Saltarín Frentiblanco

Taxonomy. [*Pipra*] *serena* Linnaeus, 1766, Crique Ipoucin, River Approuague, French Guiana.
Genus often merged with *Pipra*. Until recently treated as conspecific with *L. suavissima*, but differs markedly in voice and in syringeal anatomy, as well as in plumage characters of male. Monotypic.
Distribution. Extreme SE Guyana, Surinam, French Guiana and N Brazil N of Amazon (lower R Negro E to Amapá).



Descriptive notes. 9 cm; male average 10·7 g, female 11 g. Male is black with contrasting white forecrown, bright azure-blue lower rump and uppertail-coverts, orange-yellow patch on breast, yellow belly; iris dark brown; bill black; legs greyish to nearly black. Differs from *L. suavissima* in orange breast patch, purer yellow belly. Female is mostly green, crown tinged bluish, duller and greyer face and throat, yellower below, yellow belly and undertail-coverts. Juvenile resembles female; immature male has some black in plumage. Voice. Male call a soft, throaty, rolling "whree", given in long series; soft, descending "puurr" during display.
Habitat. Humid forest and forest edge; to 500 m.
Food and Feeding. Small fruits and insects. Fruits mainly small berries of Melastomataceae, with Rubiaceae next in importance. Items taken 1-6 m above ground, in aerial sally.
Breeding. Egg-laying from Oct/Nov (beginning of rainy season) probably to Apr in French Guiana; single record of laying in Feb in Surinam. Male display usually solitary, sometimes co-ordinated with those of others; long bouts of calling, with whirring flights between several perches. Nest a cup of whitish woody or herbaceous fibres, exterior covered with long moss filaments, some hanging below, producing total nest depth of up to 37 cm, placed 1-2 m above ground in horizontal fork of shrub or small tree. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Resident. In radio-tracking study in French Guiana, adults largely sedentary when breeding, moving over much larger area (probably of several hundred hectares) during moult period; an immature male wandered over range of 24·1 ha.
Status and Conservation. Not globally threatened. Locally common. Very common throughout forested massif of interior French Guiana; during breeding season in latter country, home ranges of two adult males were 2·8 ha and 3·2 ha (centred on single display area and bathing site), and of two females 11·2 ha and 13 ha (including several male display areas and bathing sites).
Bibliography. Blake (1950), Cohn-Haft *et al.* (1997), Cracraft (1985), Dujardin (1987), Endler & Théry (1996), Forrester (1993), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Meyer de Schauensee (1982), Novaes (1978a), Prum (1985, 1988, 1994b), Reynaud (1998), Ridgely & Tudor (1994), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Théry (1990a, 1990b, 1990c, 1992, 1997), Thiollay & Jullien (1998), Tostain (1988b), Tostain *et al.* (1992).

PLATE 12 ➤



PLATE 12

inches 4

cm 10

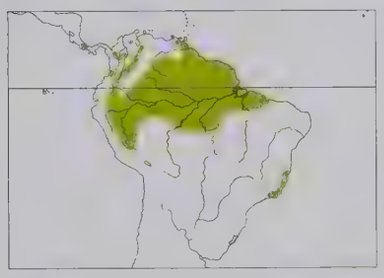
Genus *DIXIPHIA* Reichenbach, 1850

17. White-crowned Manakin

Dixiphia pipra

French: Manakin à tête blanche **German**: Weißscheitelpipra **Spanish**: Saltarín Coroniblanco
Other common names: Sclater's Manakin (NW & W races); Velvet/Zeledon's Manakin (*anthracina*)

Taxonomy. [*Parus*] *Pipra* Linnaeus, 1758, Surinam.
Genus often merged with *Pipra*. Races in Central America and W part of South American range differ vocally from E ones, and may represent a distinct species; taxonomic status of isolated race *cephaleucos* uncertain; further study required. Thirteen subspecies recognized.
Subspecies and Distribution.
D. p. anthracina (Ridgway, 1906) - C & E Costa Rica and W Panama (W of Canal Zone).
D. p. bolivari (Meyer de Schauensee, 1950) - NW Colombia (upper Sinú Valley E to S Bolívar).
D. p. minima (Chapman, 1917) - SW Colombia on W side of W Andes.
D. p. unica (Meyer de Schauensee, 1945) - subtropical zone of NC & S Colombia (Magdalena Valley).
D. p. coracina (P. L. Sclater, 1856) - NW Venezuela (Perijá Mts, and SE Lara S to SE Táchira) S, on E slope of E Andes, to E Ecuador and NC Peru (N of R Marañón).
D. p. discolor (J. T. Zimmer, 1936) - NE Peru.
D. p. occulta (J. T. Zimmer, 1936) - NC Peru on E side of C Andes.
D. p. pygmaea (J. T. Zimmer, 1936) - lower R Huallaga, in NC Peru.
D. p. comata (Berlepsch & Stolzmann, 1894) - EC Peru (S Pasco S to N Cuzco).
D. p. microlopha (J. T. Zimmer, 1929) - E Peru (S of R Marañón) and W Brazil.
D. p. pipra (Linnaeus, 1758) - S & E Venezuela, the Guianas, and lowland E Colombia and Brazil mainly N of Amazon (E to Amapá, crossing to S bank at Tefé).
D. p. separabilis (J. T. Zimmer, 1936) - S side of lower Amazon from R Tapajós E to N Maranhão.
D. p. cephaleucos (Thunberg, 1822) - coastal E Brazil (S Bahia S to Rio de Janeiro).



Descriptive notes. 9-10 cm; male average 11 g, female 12·8 g (*pipra*), male average 10·6 g, female 11 g (*separabilis*), sexes combined average 14 g (*anthracina*). Male nominate race is all black, apart from contrasting white crown and nape, nuchal feathers forming flattened crest; iris bright brick-red to brown-red; bill dark brownish-grey to blackish; legs purplish-pink to blackish. Female is green above, greyer on head, paler below, especially on throat and belly. Juvenile resembles female. Races differ primarily in extent of white on crown and nape of male, and extent of grey on head of female (least extensive and least obvious on E races): *anthracina* male has black bases of crown and nape (but not forehead) feathers, upperparts velvety black; *bolivari* resembles last but has black of plumage glossed blue; *unica* differs in having longer white crest, bases of head-top feathers entirely white; *minima* is like previous but much smaller, black more velvety; *coracina* male has black feather bases on head top, white extending farther back on nape, female is brighter than nominate, head entirely blue-grey, brighter olive above, pale olive with weak yellowish tinge below; *comata* has longer tail than previous, male head with most extensive white of all races, feather bases entirely white; *occulta* resembles previous, but nape feathers shorter, bases of crown and nape feathers sooty grey, shorter wing and tail, female rather pale, whitish below with yellowish on breast and flanks; *pygmaea* is like last but smaller, bases of crown feathers white, those of nape narrowly grey, female much paler; *microlopha* has shorter nuchal feathers than previous, marginally larger bill, female rather pale; *discolor* male has bluer (less violaceous) gloss than last, bases of crown as well as nape feathers grey; *separabilis* has narrow dusky feather bases on head top (sometimes white on forehead), moderate violaceous gloss above, rather dull and brownish below, immature male distinctive, with top of head entirely pale grey; *cephaleucos* male is identical to previous, immature male differs in white (not grey) head top, darker green back, darker underparts. Voice. Male call varies geographically: nominate race a thin, insect-like "chrrrrrr", lasting c. 1·5 seconds; *coracina* a loud "drrrrrr-eúw"; probably also other geographical variants.
Habitat. Humid forest and adjacent tall secondary woodland. Lowlands and mountains, to 1600 m in Andes; breeds mainly at 800-1500 m in Costa Rica.
Food and Feeding. Small fruits and insects. In French Guiana fruits mainly of Melastomataceae, with Rubiaceae next in importance. Items plucked or snatched from vegetation during rapid aerial sallies. Occasionally joins mixed-species flocks for brief periods.
Breeding. Egg-laying in Oct in Surinam, in Feb-May, Aug and Oct in French Guiana; in Brazil, Jun-Oct in Belém area and Nov in Manaus area. Male displays usually at "exploded" lek, from slender low branches, makes short stereotyped flights, often with crown feathers spread outwards. Nest a cup of fibres and fungal hyphae, covered on outside with dead leaves, built 1-3·5 m above ground in horizontal fork of shrub or small tree. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Resident. In Costa Rica, occasionally descends to lower altitudes during wet season. In radio-tracking studies in French Guiana, adults (especially males) sedentary during breeding season, moving over much more extensive areas (probably of several hundred hectares) during moult period; two immature males ranged over, respectively, 18·7 ha and 20·9 ha.
Status and Conservation. Not globally threatened. Fairly common to common in much of E part of range; generally less common and more local in W. Isolated race *cephaleucos* in coastal E Brazil could potentially be threatened by habitat loss; protected population occurs in Sooretama Biological Reserve. In French Guiana, breeding-season home ranges of two adult males were 2·1 ha and 2·3 ha (centred on single display area and bathing site), and of two females 8·8 ha and 9·2 ha (including several male display areas and bathing sites).
Bibliography. Castro Astor *et al.* (1998), Cohn-Haft *et al.* (1997), Eisenmann (1955), Graves (1981, 1993), Haverschmidt (1968), Haverschmidt & Mees (1994), Heindl & Winkler (2003a), Hellmayr (1929), Hilty (1997, 2003), Hilty & Brown (1986), Iafrancesco *et al.* (1987), Oniki & Willis (1982), Oren & Parker (1997), Pinto (1953), Reynaud (1998), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Sick (1993, 1997), Schubart *et al.* (1965), Slud (1964), Snow, D.W. (1961), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Stratford & Stouffer (2001), Théry (1990c, 1992, 1997), Tostain (1988b), Tostain *et al.* (1992), Wetmore (1972), Williams & Tobias (1994), Zimmer, J.T. (1930), Zimmer, K.J. & Hilty (1997).

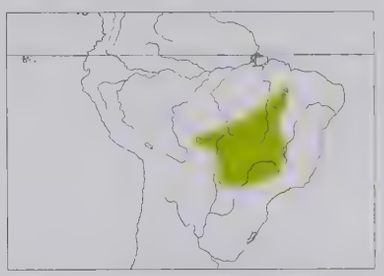
Genus *ANTILOPHIA* Reichenbach, 1850

18. Helmeted Manakin

Antilophia galeata

French: Manakin casqué **German**: Helmpipra **Spanish**: Saltarín de Yelmo

Taxonomy. *Pipra galeata* M. H. K. Lichtenstein, 1823, São Paulo, Brazil.
Genus closely related to *Chiroxiphia*; occasional intergeneric hybrids between present species and *C. caudata* recorded. Monotypic.
Distribution. Tableland of C & S Brazil (S from C Maranhão, to W Paraná), just entering NE Bolivia and NE Paraguay.



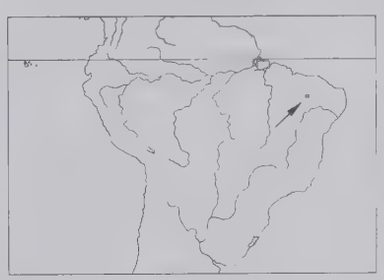
Descriptive notes. 13·9-14·5 cm; male 18-26·5 g, female 18·8-26·2 g. Distinctively crested manakin with rather long and narrow tail. Male has red forehead to back, with showy erect frontal crest; rest of plumage black; iris dark brown; bill dark; legs pinkish. Female is olive above, with smaller frontal crest, slightly duller and paler below. Juvenile resembles female. Voice. Male call a series of fast, rich musical notes with rollicking cadence, with many variations; throaty "wreee pur", first note rising, given by both sexes.
Habitat. Mainly gallery woodland in *cerrado* region, locally also in buriti palm (*Mauritia vinifera*) groves and deciduous or swampy woodland, often with nearly impenetrable lower strata; mostly 500-1000 m. May fly over open areas between stands of gallery woodland.
Food and Feeding. Fruit and insects, taken in aerial sallies. Regularly accompanies mixed-species flocks.
Breeding. Egg-laying in Aug-Dec, mainly Sept-Nov. Nest a shallow cup made from fine twigs, rootlets and leaves, with hanging leaves on outside, suspended 0·5-10 m above ground in horizontal fork of tree or shrub. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to common throughout range. Much suitable habitat remains within its extensive range, in most of which it is the only piprid species. Seems unlikely to be at any risk in foreseeable future. Present in numerous protected areas, e.g. Serra da Canastra, Brasília, Das Emas and Chapada dos Guimarães National Parks (Brazil).
Bibliography. Bates & Parker (1998), Capper *et al.* (2000), Cavalcanti (1999), Cracraft (1985), Dubs (1992), Ferreira & Cavalcanti (1997, 2000), Forrester (1993), Haffer (1985), Hayes (1995), Hellmayr (1929), Marini (1989, 1992a, 1992b), Marini & Cavalcanti (1992), Marini *et al.* (1997), Meyer de Schauensee (1982), Pacheco & Parrini (1995), Pozza (2002), Ridgely & Tudor (1994), Reis *et al.* (1997), Sick (1960, 1967, 1979b, 1993, 1997), Silveira (1998), Stotz *et al.* (1996), Tobias *et al.* (1993), Tubelis & Tomas (2000).

19. Araripe Manakin

Antilophia bokermanni

French: Manakin de Bokermann **German**: Araripe-Helmpipra **Spanish**: Saltarín de Araripe

Taxonomy. *Antilophia bokermanni* Coelho and Silva, 1998, Nascente do Farias, Chapada do Araripe, Ceará, Brazil.
Genus closely related to *Chiroxiphia*. Monotypic.
Distribution. S Ceará (Chapada do Araripe), in NE Brazil.



Descriptive notes. 15-15·5 cm; 19-20·5 g. Strikingly patterned piprid with erect frontal crest. Male has bright red crest, crown and nape to upper back; rest of plumage mainly white, except for contrasting black flight-feathers and tail, and black inner webs of some upperwing-coverts; iris russet; bill dark; legs dusky brown. Female is olive above, with smaller frontal crest, duller and paler below, especially on belly; differs from very similar female *A. galeata* in paler underparts. Juvenile apparently undescribed. Voice. Male call a repeated musical "guru-uí", both sexes a throaty "wreee pur" with ascending first note; very similar to calls of *A. galeata*.
Habitat. Evergreen secondary forest, moving occasionally into more open adjacent areas; c. 800 m.
Food and Feeding. Recorded as feeding on small fruits of *Cordia* (Boraginaceae).
Breeding. Two females had incubation patches at end Jul. No other information.
Movements. No information; hitherto recorded only from one restricted area.
Status and Conservation. CRITICAL. A very recently discovered species, first observed in 1996. Apparently confined to forested valley (or valleys) running down from the elevated Chapada do

On following pages: 20. Long-tailed Manakin (*Chiroxiphia linearis*); 21. Lance-tailed Manakin (*Chiroxiphia lanceolata*); 22. Blue-backed Manakin (*Chiroxiphia pareola*); 23. Yungas Manakin (*Chiroxiphia boliviana*); 24. Blue Manakin (*Chiroxiphia caudata*); 25. Pin-tailed Manakin (*Ilicura militaris*).

Araripe; known range covers no more than c. 1 km², and total population estimated at fewer than 250 individuals. Area where found lies within the Araripe National Forest, which is part of a large Environmental Protection Area; whole area is of high conservation priority and enjoys partial, but not yet legally binding, protection. Lowland forest adjacent to this species' habitat has already been cleared for commercial plantations, farming and human settlement; associated developments, e.g. road-building and construction of recreational facilities, represent a major threat. Conservation priorities include dedicated surveys of suitable habitat in nearby areas, aimed at determining the existence or otherwise of additional populations of this piprid. If its future is to be secured, effective protection of its habitat is a vital and urgent necessity.

Bibliography. Anon. (1997a, 1997b), Coelho & Silva (1998), Mazar Barnett & Kirwan (2002a), Mendes de Azevedo *et al.* (2000), do Nascimento *et al.* (2000), Stattersfield & Capper (2000).

Genus *CHIROXIPHIA* Cabanis, 1847

20. **Long-tailed Manakin**

Chiroxiphia linearis

French: Manakin fastueux **German**: Langschwanzpipra **Spanish**: Saltarín Colilargo

Taxonomy. *Pipra linearis* Bonaparte, 1838, Santa Efigenia, Oaxaca, Mexico.
Genus closely related to *Antilophia*. All members of present genus suggested by some as forming a superspecies. Has sometimes been treated as conspecific with *C. lanceolata* and *C. pareola*. Two subspecies recognized.
Subspecies and Distribution.
C. l. linearis (Bonaparte, 1838) - tropical zone of Pacific coastal S Mexico (extreme E Oaxaca, Chiapas) and Guatemala.
C. l. fastuosa (Lesson, 1842) - tropical zone of El Salvador S to NW Costa Rica.



Descriptive notes. 11·5 cm, excluding tail extensions 10-15 cm in male, 2-3 cm in female; male 16·8 g, female 19·1 g. Male has short black frontal crest, red crown patch, light blue back and scapulars; rest of plumage, including greatly elongated central rectrices, black; iris dark reddish-brown; bill black; legs rather dull yellow-orange. Differs from *C. lanceolata* in very much longer and less pointed central rectrices, duller leg colour. Female is olive-green, paler and yellower on throat and, especially, on belly and undertail-coverts. Juvenile resembles female; immature male acquires red crown and somewhat elongated central rectrices by age of 1 year, passes through sequence of distinct, age-specific intermediate stages, assumes full adult plumage in fourth year. Race *fastuosa* is brighter than nominate, red hindcrown feathers form short crest. Voice. Male call, given in duet with another male, a pure, musical "to-lay-do" or "te dee oh"; during courtship dance males alternately utter nasal, twanging "nyanyownh", and at end of dance dominant male gives sharp "buzz-weent".
Habitat. Dry forest and humid forest with abundant undergrowth, also gallery woodland, borders of mangrove swamps and tall second growth; to c. 1500 m.
Food and Feeding. Mainly fruits of trees and shrubs, also insects. Food items plucked or snatched in aerial sallies.
Breeding. Egg-laying in Mar-Aug in Costa Rica. Male displays low down on slender horizontal stems, where joined by one or two subordinate males, two birds alternately making fluttering upward leaps; on arrival of a female, jumps and hovers, then flutters backwards and down to perch, whereupon other male performs same movement, this continuing until sharp call by dominant male causes subordinate to leave; only dominant male mates with female. Nest a shallow cup containing leaves and sometimes grass blades, bark strips, moss or fern fragments, lined with fungal hyphae and leaf midribs, dead leaves hanging below for up to 8·5 cm, suspended 0·7-1·7 m above ground from fork of shrub or near end of small branch of small tree, attached by spider web or insect-cocoon threads, fungal rhizomorphs wrapped around twigs of fork; always sited so that adjacent shoots and leaves provide roof over nest. Clutch usually 2 eggs, records of single-egg clutches perhaps due to partial loss; no information on incubation and fledging periods. Breeding success in Costa Rica study area low: of 15 eggs observed, only one hatched and young did not fledge, presumed preyed on. Male does not reach dominant status until up to ten years.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Common to fairly common; locally abundant in Costa Rica, where present in Carara Biological Reserve. Relatively wide habitat tolerance should ensure its survival.

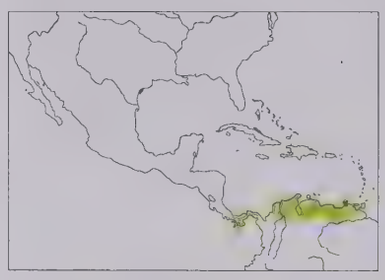
Bibliography. Beletsky (1998, 1999), Binford (1989), Ceballos & Valdelamar (2000), Dearborn (1907), Eisenmann (1955), Fogden (1993), Foster (1976, 1977a, 1977c, 1984, 1985, 1987), Griscom (1950), Hellmayr (1929), Henderson (2002), Howell & Webb (1995a), Komar & Domínguez (2001), Land (1970), McDonald (1987, 1989a, 1989b, 1993a, 1993b, 2003), McDonald & Potts (1994), Rowley (1984), Slud (1964), Stiles (1983, 1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Trainer & McDonald (1993, 1995), Trainer & Parsons (2001), Trainer *et al.* (2002), Wetmore (1941, 1944), Wheelwright (1985, 1988).

21. **Lance-tailed Manakin**

Chiroxiphia lanceolata

French: Manakin lancéolé **German**: Lanzettschwanzpipra **Spanish**: Saltarín Lanceolado

Taxonomy. *Pipra lanceolata* Wagler, 1830, "Guiana sive Cajenna"; error = Cerro Turumiquire, Sucre, Venezuela.
Genus closely related to *Antilophia*. All members of present genus suggested by some as forming a superspecies. Has sometimes been treated as conspecific with *C. linearis* and *C. pareola*. Monotypic.
Distribution. Pacific coastal region of extreme SW Costa Rica and Panama (including Coiba I and Cébaco I), N Colombia along Caribbean coast (including Santa Marta area), and N Venezuela N of R Orinoco (E, including Margarita I, to Paria Peninsula).



Descriptive notes. Male 13·5 cm (including elongated tail feathers), 2 birds 15·1 g and 17·9 g; female 13 cm (including elongated tail feathers), 14·1-19·8 g. Male has short black frontal crest, red crown patch, light blue back and scapulars; rest of plumage, including elongated central rectrices, black; iris dark reddish-brown; bill black; legs orange or orange-red. Differs from *C. linearis* in much shorter and sharply pointed central rectrices, brighter legs. Female is olive-green, paler and yellower on throat and, especially, on belly and undertail-coverts; like female *C. linearis*, but central rectrices pointed and somewhat shorter. Juvenile resembles female; immature male acquires red crown and somewhat elongated central rectrices by age of 1 year, then has several intermediate plumage stages. Voice. Male call, in duet with another male, a clear, musical "to-wit-doo"; during courtship dance repeated frog-like "na-a-a-a-a-a-a" and nasal "tuuuoo", similar to calls of *C. linearis*.
Habitat. Woodland with thick lower growth, from dry to humid, including patches of thick scrub and second-growth woodland in semi-open country; to 1500 m, locally to 1700 m.
Food and Feeding. Mainly fruits from shrubs and small trees, plucked in flight; also insects.
Breeding. Aug-Sept in Panama. Male displays low down on slender horizontal stems, where joined by a subordinate male, the two alternately making fluttering upward leaps and short flights; only dominant male mates with female. Nest a small shallow cup of grass and leaf fibres, slung c. 1 m above ground in horizontal forked twig of low bush, with dead leaves forming exterior covering and hanging loosely from sides and bottom. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Fairly common to locally common; common throughout N Venezuela. Relatively wide habitat tolerance should ensure its survival. Present in several protected areas, e.g. Tayrona National Park (Colombia), and Henri Pittier and Guatopo National Parks (Venezuela).

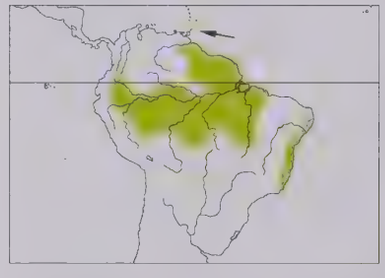
Bibliography. Blake (1958), Eisenmann (1955), Foster (1985), Friedmann & Smith (1950, 1955), Haffer (1975), Hallinan (1924), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Iafrancesco *et al.* (1987), Meyer de Schauensee (1982), Moermond & Denslow (1985), Pacheco & Laverde (2002, 2003), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Slud (1964), Snow, D.W. (1977b), Stiles (1983, 1985), Stiles & Skutch (1989), Stone (1913), Stotz *et al.* (1996), Wetmore (1939, 1957, 1972), Willis & Eisenmann (1979).

22. **Blue-backed Manakin**

Chiroxiphia pareola

French: Manakin tijé **German**: Prachtpipra **Spanish**: Saltarín Dorsiazul
Other common names: Tobago Manakin (*atlantica*)

Taxonomy. [*Pipra*] *pareola* Linnaeus, 1766, Cayenne.
Genus closely related to *Antilophia*. All members of present genus suggested by some as forming a superspecies. Has sometimes been treated as conspecific with *C. linearis* and *C. lanceolata*. Formerly included *C. boliviana* as a race, but the two recently shown to differ in ecology and voice. Four subspecies recognized.
Subspecies and Distribution.
C. p. napensis W. deW. Miller, 1908 - S & SE Colombia (E of Andes), E Ecuador and N Peru (mainly N of R Marañón).
C. p. regina P. L. Sclater, 1856 - E Peru (S of R Marañón), W Brazil mostly S of Amazon (E to lower R Tapajós, also recorded N of Amazon at two sites W of R Negro) and extreme N Bolivia.
C. p. atlantica Dalmas, 1900 - Tobago.
C. p. pareola (Linnaeus, 1766) - E Venezuela (NE Bolívar), the Guianas, and NE & E Brazil (from Roraima, Obidos and right bank of R Tapajós E to Maranhão and S to Mato Grosso and SE Pará, also isolated coastal population from Rio Grande do Norte S to Espírito Santo).



Descriptive notes. 12-12·5 cm; male 17-21 g (nominate), 20-24·5 g (*atlantica*), female 18-21 g. Male nominate race has small black frontal crest, red crown patch, light blue back and scapulars; rest of plumage black; outer three primaries pointed, with shafts thickened and barbs reduced; iris dark reddish-brown; bill black; legs orange-red. Differs from almost identical *C. lanceolata* in lack of elongated central rectrices. Female is olive-green, paler and yellower on throat, with yellowish-white belly and undertail-coverts, flesh-coloured legs. Juvenile resembles female; immature male passes through sequence of intermediate plumages, in first stage acquiring red cap and sometimes some blue on back. Races differ in size and, mostly slightly, in male coloration: *atlantica* is largest; *napensis* is rather small, has red on crown brighter, blue on back somewhat darker; *regina* has crown patch golden-yellow, not red. Voice. Male advertising call a rolling "wrrrr", often followed by abrupt single or double "chup"; also a disyllabic "joy-ee"; male duets consist of series of almost perfectly synchronized "chup" notes; during courtship dance twanging notes given at increasing speed, ending with very loud "swee-eeék" by dominant male, similar to calls of *C. linearis*.
Habitat. Mainly humid forest and mature secondary woodland with abundant woody undergrowth; also drier forest and scrubby woodland in Tobago, Venezuela and Guyana. Mainly lowlands to c. 500 m; locally to 750 m in Ecuador and Peru. In E Brazil (S Bahia and Espírito Santo), where overlaps in range with *C. caudata*, is restricted to lowlands, whereas latter is confined to montane forest above 500 m.
Food and Feeding. Small fruits and insects. Items plucked or snatched from vegetation in sallying flights.
Breeding. Mar-Jul in Tobago; in Brazil, egg-laying in Sept-Apr in N (Belém area) and Nov in E (Bahia). Male displays low down on slender horizontal stems, where joined by one or two subordinate males, two birds perching close together and alternately making fluttering upward leaps; on arrival of a female, jumps and hovers, then flutters backwards and down to perch, whereupon other male performs same movement, this continuing until sharp call by dominant male causes subordinate to leave; dominant male gives butterfly-like flight around female, before mating. Nests in

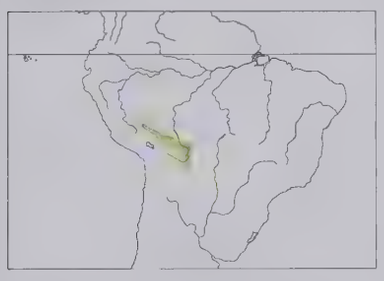
Tobago c. 2 m above ground, one a deep but flimsy cup of rootlets with base of dead leaves, saddled in lateral fork, another in leaf base of small palm; in Belém area 1-2 m above ground, usually with dry leaves and fibres hanging below. Clutch 2 eggs; in captivity, incubation period 17 days, young left nest after 15 days, fed by adult for several weeks.
Movement. Apparently sedentary.
Status and Conservation. Not globally threatened. Rather uncommon to locally common; common in parts of Tobago and the Guianas; fairly common but very local in Venezuela; apparently much less common in some W parts of range, e.g. Colombia, but uncommon to locally fairly common in Ecuador and Peru. Wide habitat tolerance should ensure its long-term survival.
Bibliography. Bangs & Penard (1918), Best *et al.* (1997), Butler (1979), Capparella (1988), ffrench (1991), ffrench & Kenefick (2003), Foster (1985), Gilliard (1959), Haffer (1997b), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Herklots (1961), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Oren & Parker (1997), Ortiz & Carrión (1991), Parker & Remsen (1987), Pinto (1953), Pinto & Camargo (1961), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rutgers & Norris (1977), Sick (1960, 1993, 1997), Snow, D.W. (1963b, 1971b, 1976b, 1977b, 1985a), Snyder (1966), Spee (2001), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tostain *et al.* (1992), Zimmer & Hilty (1997).

23. Yungas Manakin

Chiroxiphia boliviana

French: Manakin des yungas **German**: Yungaspipra **Spanish**: Saltarín Yunga

Taxonomy. *Chiroxiphia pareola boliviana* J. A. Allen, 1889, Apolo, La Paz, Bolivia.
Genus closely related to *Antilophia*. All members of present genus suggested by some as forming a superspecies. Until recently considered a race of *C. pareola*, but now recognized as distinct on basis of ecology and voice. Monotypic.
Distribution. E slope of Andes from S Peru (S from Cuzco) S to SC Bolivia (S to Chuquisaca).



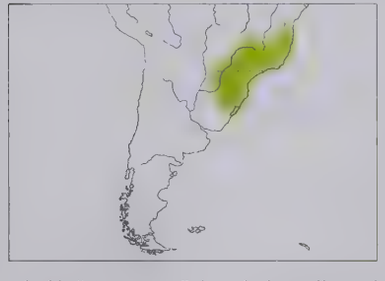
Descriptive notes. 13 cm; male 16·4 g, female 17·9 g. Male has small black frontal crest, dark red crown patch, light blue back and scapulars; rest of plumage black; outer three primaries pointed, with shafts thickened and barbs reduced; iris dark reddish-brown; bill black; legs purplish-brown. Distinguished from extremely similar *C. pareola* by distinctly longer tail, slightly darker red crown, darker legs. Female is olive-green, paler and greyer on belly. Juvenile apparently not described, presumably as female. Voice. Not well known; male advertising call a high-pitched "chereeo", with variations.
Habitat. Montane forest, at 650-2200 m.
Food and Feeding. No details; presumably much as for *C. pareola*. Often visits fruiting trees at forest edge.
Breeding. Not recorded.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Peruvian East Andean Foothills EBA and Bolivian and Peruvian Lower Yungas EBA. Locally fairly common. Frequently observed at Machu Picchu Historical Sanctuary.
Bibliography. Clements & Shany (2001), Fjeldså & Maijer (1996), Graves *et al.* (1983), Hellmayr (1929), Hennessey, Herzog & Sagot (2003), Parker & Remsen (1987), Parker & Wust (1994), Perry *et al.* (1997), Remsen & Traylor (1989), Ridgely & Tudor (1994), Schulenberg *et al.* (1997), Stotz, Fitzpatrick *et al.* (1996), Stotz, Montambault *et al.* (2002), Walker (2001).

24. Blue Manakin

Chiroxiphia caudata

French: Manakin à longue queue **German**: Blaubrustpipra **Spanish**: Saltarín Azul
Other common names: Swallow-tailed Manakin

Taxonomy. *Pipra caudata* Shaw, 1793, Rio de Janeiro, Brazil.
Genus closely related to *Antilophia*, and occasional intergeneric hybrids between present species and *A. galeata* recorded; has apparently hybridized also with *Ilicura militaris*. All members of present genus suggested by some as forming a superspecies. Monotypic.
Distribution. SE Brazil (S Goiás and S Bahia S to W Paraná and Rio Grande do Sul), SE Paraguay and extreme NE Argentina (Misiones, NE Corrientes).



Descriptive notes. Male 15 cm, female 14·5 cm; mean 25·6 g. Male distinctively patterned, both sexes with elongated central rectrices. Male has black head with red band from forehead to nape; body and much of tail bright turquoise-blue, wings and outer tail black, undertail-coverts dusky; iris dark brown; bill flesh-coloured to sooty; legs pinkish to sooty. Female is dull green, paler below, a few having orange-yellow forehead more or less concealed by green mottling. Juvenile resembles female; immature male passes through a series of intermediate plumages, acquires full adult plumage when c. 3 years old. Voice. Male call a double "ptuwa ptuwa"; in male duet calls overlap, not well synchronized, giving impression of confused gabbling; during courtship dance loud guttural "kwa-a-a-a", at end of dance repetition of loud sharp "eek", similar to calls of *C. linearis*. Far-carrying "chorreeo cho-cho-cho" by both sexes in variety of contexts.
Habitat. Humid forest and secondary woodland, also edges. Mostly below 1500 m, occasionally to 1900 m. In E Brazil (S Bahia and Espírito Santo), where overlaps in range with *C. pareola*, confined to montane forest above 500 m, whereas that species is restricted to lowlands.
Food and Feeding. Small fruits and insects. Items plucked or snatched usually in aerial sally, but sometimes while perched.
Breeding. Egg-laying mainly in Aug-Feb. Male displays low down on slender horizontal stems, where joined by two (sometimes more) subordinate males, the three alternately making fluttering upward leaps; on arrival of a female, all three perch close together and take turns to jump and hover in front of her before landing at back of queue, shuffling forward in line as the individual nearest female jumps up, entire performance being terminated by sharp call by dominant male. Nest made of dry plant fibres, fungal rhizomorphs, sometimes including moss, with dry leaves attached to outside and hanging below, suspended from low fork of small tree or shrub. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Fairly common in most of range, and common in many areas. Might be subjected to habitat destruction in future, but ability to thrive in secondary woodland and edge habitats should ensure its survival. Present in several protected areas, e.g. Ybicuí National Park (Paraguay), Serra dos Órgãos and Itatiaia National Parks (Brazil), and Iguaçu and Iguazú National Parks (Brazil/Argentina).
Bibliography. Brooks *et al.* (1993), Canevari *et al.* (1991), Capper *et al.* (2000), Chebez *et al.* (1999), Clay (1995), Contreras (1983), Cracraft (1985), Ferro & Donatelli (2000), Forrester (1993), Foster (1977a, 1977b, 1981, 1984, 1985, 1987), Galetti & Pizo (1996), Guix (1995), Guix *et al.* (1992), Hayes (1995), Hellmayr (1929), Lowen *et al.* (1996), Mallet-Rodrigues & Marinho (2003), Marini & Hackett (2002), Mazar Barnett & Pearman (2001), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Pacheco & Parrini (1995), de la Peña (1989), Ridgely & Tudor (1994), do Rosário (1996), Saibene *et al.* (1996), Sick (1960, 1967, 1979b, 1993, 1997), Snow, D.W. (1976b, 1977b), Stotz *et al.* (1996), Tobias *et al.* (1993), Willis & Oniki (1988b).

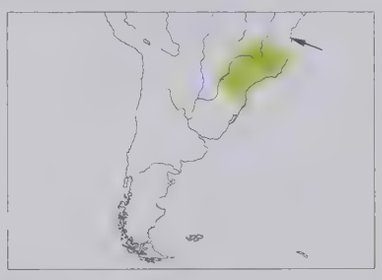
Genus *ILICURA* Reichenbach, 1850

25. Pin-tailed Manakin

Ilicura militaris

French: Manakin militaire **German**: Rotbürzelpipra **Spanish**: Saltarín Militar

Taxonomy. *Pipra militaris* Shaw, 1809, South America = vicinity of Rio de Janeiro, Brazil.
Has apparently hybridized with *Chiroxiphia caudata*. Monotypic.
Distribution. SE Brazil in S Bahia, and from S Minais Gerais and Espírito Santo S to W Paraná and NE Santa Catarina.



Descriptive notes. Male 12·5 cm, female 11 cm; mean 14·6 g. Male has red patch on forehead, red lower back to uppertail-coverts; rest of upperparts, including tail and most of wings, black, inner remiges olive; central pair of tail feathers pointed, project 21-25 mm beyond rest; outer primaries unusually broad at end and narrow at base (instrumental in making whirring sound in flight during display), secondaries stiffened, with thickened shafts (used in making snapping sounds during display); rear part of head side pale greyish, underparts paler, whitest on belly, some blackish streaks on flanks; iris dull orange; bill pale horn, dark grey culmen; legs pinkish or flesh-coloured, with grey tinge. Female is olive above, grey on face and throat, light greyish-olive below, pointed central rectrices project 2-7 mm. Juvenile resembles female. Voice. Male advertising call an often repeated series of 5-8 high-pitched, rather soft, descending notes, "see-see-see-see-see"; similar series of 3-4 notes given by both sexes away from display area. Whirring and snapping sounds by displaying male in flight.
Habitat. Humid forest and mature secondary woodland, to 1200 m; in N of range only in mountains, but down to sea-level in S.
Food and Feeding. Small fruits and insects. Fruits recorded as eaten are those of Myrsinaceae (*Rapanea*), Loranthaceae and Melastomataceae. Food items plucked or snatched in aerial sally. Males attending display territories feed rapidly at nearby fruiting trees during short absences lasting 1·5-3 minutes. Regularly accompanies mixed-species foraging flocks.
Breeding. Few records. Laying probably in Nov-Feb. Male displays solitarily (but within hearing distance of one or two others), in small arena having many slender stems, raises rump feathers while singing, makes short rapid flights, makes short jumps over female crouched on perch. Nest a shallow "basket", 4 m above ground. No other information.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Considered uncommon to locally fairly common. Could possibly suffer from habitat destruction, but occurs in several protected forest areas, including Serra dos Órgãos, Tijuca and Itatiaia National Parks, as well as Augusto Ruschi Biological Reserve.
Bibliography. Anciães & del Lama (2002), Anciães & Straube (1997), Anciães *et al.* (2000), Cracraft (1985), Forrester (1993), Haffer (1985), Hellmayr (1929), Marini & Hackett (2002), Meyer de Schauensee (1982), Ridgely & Tudor (1994), do Rosário (1996), Santos & Ferreira (2000), Sick (1960, 1967, 1993, 1997), Silveira (1998), Snow & Snow (1985), Souza (1999), Stotz *et al.* (1996), Tobias *et al.* (1993), Venturini *et al.* (2001).



PLATE 13

inches 2,7

cm 7

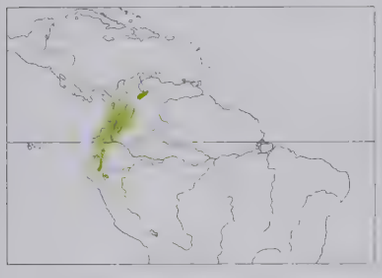
Genus *MASIUS* Bonaparte, 1850

26. Golden-winged Manakin

Masius chrysopterus

French: Manakin aux ailes d'or **German**: Goldschwingenpipra **Spanish**: Saltarín Alidorado

Taxonomy. *Pipra chrysoptera* Lafresnaye, 1843, Santa Fe de Bogotá, Colombia.
Genus apparently closest to *Corapipo*, probably also close to *Ilicura*. Five subspecies recognized.
Subspecies and Distribution.
M. c. bellus Hartert & Hellmayr, 1903 - W Colombia on W side of W Andes E to W side of C range.
M. c. chrysopterus (Lafresnaye, 1843) - both sides of Andes in NW Venezuela and C Colombia (C range).
M. c. coronulatus P. L. Sclater, 1860 - W side of W Andes in SW Colombia and W Ecuador.
M. c. pax Meyer de Schauensee, 1952 - E side of Andes in S Colombia and Ecuador.
M. c. peruvianus Carriker, 1934 - extreme S Ecuador (S Zamora-Chinchipe) and N Peru (Cajamarca, N San Martín).



Descriptive notes. 11 cm; male 9-12·5 g, 2 females 12 g and 13·5 g. Male distinctive, feathers of forecrown projecting forwards, those of hindcrown and nape lying flat (scale-like), feathers on each side of crown projecting backwards to form two small lateral "horns". Male nominate race has golden-yellow forehead and crown, feathers of hindcrown and nape broadly tipped orange; rest of plumage mostly black, with pale yellow patch on throat and breast (largely concealed except at moment of giving advertising call), bright yellow underwing-coverts and inner webs of middle flight-feathers (conspicuous in flight), yellow inner webs of tail feathers (rarely visible); iris dark brown; bill pale flesh-coloured to steel-grey; legs pinkish to dull red or purplish. Female is olive, with yellow patch on throat, yellowish belly. Juvenile resembles female; immature male has some yellow on crown and throat, later acquires some black feathering in plumage (appears mottled). Races differ mainly in colour of male's hindcrown and nape: brown to reddish-brown in *bellus* and *coronulatus*, orange-red in *pax* and *peruvianus*. Voice. Male advertising call a low, nasal, frog-like "nurrt"; during display a high, continuous "seeeeeee" in flight to display-log, a double "tseet-tseet" just before landing, then "nurrt" during rebound.
Habitat. Wet montane forest and forest borders in subtropical zone and foothills; mainly 1000-2300 m, on Pacific slope down to 600 m in Colombia and to 400 m in Ecuador.
Food and Feeding. Small fruits and insects, taken in short flight sallies. Main food plants at two sites in Ecuador were four species of *Miconia* (Melastomataceae); other plant families exploited were Boraginaceae, Poaceae and Rubiaceae. Regularly accompanies mixed-species flocks, but also forages singly or in groups of 2-3 birds.
Breeding. Record of egg-laying in Jun in Colombia. Male display centred on log on forest floor, with stereotyped approach flight obliquely down to alight on log, followed by rebounding jump, also perches motionless on it with tail raised, also has bowing display with "horns" erected. Nest a thin-walled cup of rootlets and moss, suspended from horizontal fork 2-3 m over stream. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Inconspicuous and easily overlooked, so possibly more numerous than it appears to be. Known to occur in several protected areas, including Guaramacal National Park (Venezuela), Río Ñambí and La Planada Nature Reserves (Colombia) and Podocarpus National Park (Ecuador).
Bibliography. Allen (1998), Best *et al.* (1997), Bloch *et al.* (1991), Butler (1979), Chapman (1917c), Hellmayr (1929), Hilty (1997, 2003), Hilty & Brown (1986), Iafrancesco *et al.* (1987), Meyer de Schauensee (1945, 1982), Miller (1963), Ortiz & Carrión (1991), Parker (1992b, 1997), Parker *et al.* (1985), Pearson & Belebsky (2000), Prum & Johnson (1987), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg & Wust (1997), Snow & Snow (1992), Stotz *et al.* (1996), Williams & Tobias (1994).

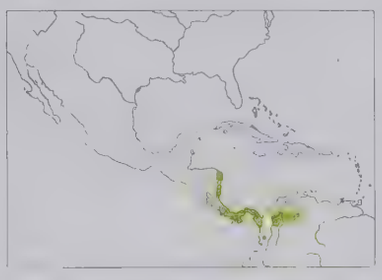
Genus *CORAPIPO* Bonaparte, 1854

27. White-ruffed Manakin

Corapipo leucorrhoa

French: Manakin orné **Spanish**: Saltarín Gorgiblanco Occidental
German: Westliche Weißkehlpipra
Other common names: White-bibbed Manakin (*leucorrhoa*)

Taxonomy. *Pipra leucorrhoa* P. L. Sclater, 1863, Bucaramanga, Santander, Colombia.
Genus probably close to *Masius*; has also been suggested as possibly sister to *Heterocercus* on basis of display behaviour and nest architecture. Probably forms a superspecies with *C. gutturalis*. W races *altera* and *heteroleuca* sometimes treated as a separate species, on basis mainly of greatly reduced outer primary. Three subspecies recognized.
Subspecies and Distribution.
C. l. altera Hellmayr, 1906 - Caribbean slope of Central America S from E Honduras, Pacific slope of S Costa Rica and Panama (except W Chiriquí), and NW Colombia (W of Atrato Valley).
C. l. heteroleuca Hellmayr, 1910 - Pacific slope of SW Costa Rica and W Panama (W Chiriquí).
C. l. leucorrhoa (P. L. Sclater, 1863) - locally in Perijá Mts, W Venezuela (lower slopes of Andes) and NC & W Colombia (S to middle Magdalena Valley, E to NW Arauca, also Pacific slope in Valle).



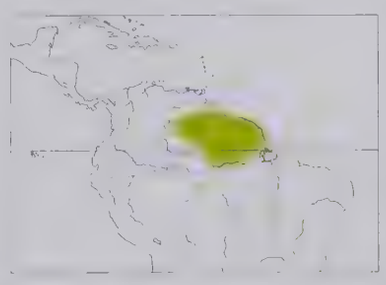
Descriptive notes. 9·5-10 cm; male 11·1 g, female 12·5 g. Male has white throat feathers elongated at sides to form ruff; rest of plumage glossy blue-black, some white on under-tail-coverts; iris dark brown; upper mandible blackish, cutting edges and lower mandible bluish-grey; legs rather dull reddish-pink, feet sometimes darker and greyer. Female is olive, with pale greyish throat, pale yellowish belly, lead-grey legs. Juvenile resembles female; immature male has paler grey throat, often with varying amount of white, acquires blackish face mask and white throat in second year. Race *altera* has outermost primary very short and narrow, much smaller than that of nominate; *heteroleuca* has outer primary reduced like previous, but white on throat less extensive. Voice. Male advertising call a high, rolling "prreeet"; also a sharp "seee"; in display, male landing on log makes a dull wing-snap, followed immediately by vocal "chee waa".
Habitat. Humid forest and tall secondary growth, also edges with fruiting trees, in foothills and lower mountain slopes. Sea-level to 1500 m in Central America; to 1200 m in Venezuela, and at 200-1500 m (above 400 m when breeding) in Colombia.
Food and Feeding. Mainly small fruits, with small proportion of insects and spiders. In small study area in Costa Rica, total of 57 species of fruit, mainly of Melastomataceae and Rubiaceae, recorded in diet. Females more insectivorous than males, especially during breeding season. Food items plucked or snatched in upward aerial sally. Sometimes joins mixed-species foraging flocks.
Breeding. Egg-laying in Mar-Jun in Costa Rica. Male display centred on log on forest floor, alone or with other males (adult and immature) and at times co-ordinated, includes steep upward flight from log followed by fast landing with rebounding jump with "about-face" turn, also slow flights with fluffed plumage to and from log; dominant male alone present when female visits, his pre-mating display elaborate, a series of flight displays close to ground, ending with female perching on central part of log, from which male flies up in steep spirals to above forest canopy, hovers briefly, then plummets down to alight beside her on log. Nest a small cup made of thin brown filaments or blackish fungal rhizomorphs, with leaf skeletons attached to bottom, slung in horizontal fork 5-7 m above ground. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Largely resident. In S Costa Rica, race *altera* descends to foothills and adjacent lowlands between about Jul and Dec/Jan, and sporadically at other seasons, females probably moving farther downhill on average than males. Possibly similar altitudinal movements in Panama.
Status and Conservation. Not globally threatened. Common in Costa Rica, fairly common to common in Panama; uncommon and very local in Venezuela and Colombia. Populations of NW South America fragmented and severely reduced by forest destruction.
Bibliography. Beletsky (1998), Chapman (1917c), Cooper (1997), Davis (1982), Eisenmann (1955), Fogden (1993), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Iafrancesco *et al.* (1987), Levey & Stiles (1994), Loiselle & Blake (1999), Luck & Daily (2003), Meyer de Schauensee (1982), Moermond & Denslow (1985), Monroe (1968), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Rosselli (1989, 1994), Rosselli *et al.* (2002), Sekercioglu *et al.* (2002), Skutch (1967, 1969), Slud (1960, 1964), Stiles (1983, 1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1972).

28. White-throated Manakin

Corapipo gutturalis

French: Manakin à gorge blanche **Spanish**: Saltarín Gorgiblanco Oriental
German: Östliche Weißkehlpipra

Taxonomy. [*Pipra*] *gutturalis* Linnaeus, 1766, Cayenne.
Genus probably close to *Masius*; has also been suggested as possibly sister to *Heterocercus* on basis of display behaviour and nest architecture. Probably forms a superspecies with *C. leucorrhoa*. Monotypic.
Distribution. S Venezuela (Bolívar, N Amazonas), the Guianas and N Brazil (Roraima E to Amapá, S locally to Manaus area).



Descriptive notes. 8·5-9·5 cm; male 8·1 g, female 8·8 g. Male has white on throat extending down to upper breast, where ends in a point; rest of plumage glossy blue-black, inner webs of inner primaries white (white patch in flight); iris dark; bill pale greyish-horn or pale flesh-coloured, darker and greyer above; legs purplish. Female is dull olive above, mostly greyish-white below, looking paler-bellied than females of most similar species, legs often lead-grey or greyish. Juvenile resembles female; immature male has white throat, later acquiring some black feathering on body. Voice. Both sexes give high, thin "seeu-see" and "chip" notes. Male advertising call a lengthened version, "seeu-see-ee-ee-ee"; in display-flight to log 2-10 high "seee" notes, a "pop" wing noise just before landing, then a complex "tickee-yeah" during rebound.
Habitat. Humid forest, occasionally at borders, mainly in hilly areas; 200-1100 m in Venezuela, 400-700 m in Surinam.
Food and Feeding. Small fruits and insects; fruits of Melastomataceae, followed by Rubiaceae, main components of diet in French Guiana. Items taken mainly in aerial sallies. Tends to forage at higher levels than most other piprids. Regularly accompanies mixed-species feeding flocks.
Breeding. Record of egg-laying in Oct in French Guiana. Male display centred on large log on forest floor, sometimes with other males, sometimes well separated from them in "exploded" lek, includes slow flight to log, from which "bounces" up and alights short distance away, facing in

On following pages: 29. White-collared Manakin (*Manacus candei*); 30. Orange-collared Manakin (*Manacus aurantiacus*); 31. Golden-collared Manakin (*Manacus vitellinus*); 32. White-bearded Manakin (*Manacus manacus*).

opposite direction; pre-mating display, by dominant male alone, a spiralling upward flight to above canopy, plummeting back to log. Nest a very small cup, of moss on outside, lined with thin layer of black fungal rhizomorphs (*Marasmius*), 8·3 m above ground in horizontal fork of small tree, bound to supporting twigs by cobweb. Clutch size apparently not documented, presumably 2 eggs; no information on incubation and fledging periods.
Movements. Resident. In French Guiana, colour-ringed adult males ranged over 2-2·5 ha during breeding season, females over 9-10 ha.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common in Venezuela; locally common in the Guianas. Difficult to observe and easily overlooked.
Bibliography. Blake (1950), Cohn-Haft *et al.* (1997), Davis, T.A.W (1949a), Davis, T.H. (1982), Endler & Théry (1996), Forrester (1993), Gilliard (1941), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Meyer de Schauensee (1982), Novaes (1978a), Prum (1986), Reynaud (1998), Ridgely & Tudor (1994), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Théry (1990a, 1990b, 1990c, 1992, 1997), Théry & Vehrenkamp (1995), Tostain (1988c), Tostain *et al.* (1992), Wenny (2001).

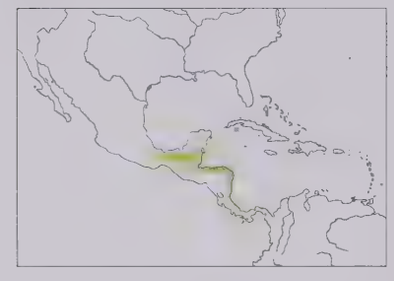
Genus *MANACUS* Brisson, 1760

29. White-collared Manakin

Manacus candei

French: Manakin à col blanc **German**: Weißbandpipra **Spanish**: Saltarín Cuelliblanco
Other common names: Almirante Manakin ("*M. cerritus*")

Taxonomy. *Pipra candei* Parzudaki, 1841, Trujillo, Honduras.
Genus possibly closest to *Chiroxiphia* and *Antilophia*. Its four members form a superspecies, and all sometimes treated as conspecific under the name *M. manacus*. Present species hybridizes with *M. vitellinus* in NW Panama (Bocas del Toro); hybrid forms have been treated as a distinct species, *M. cerritus*. Monotypic.
Distribution. Caribbean slope from SE Mexico (N Oaxaca) S to extreme W Panama (NW Bocas del Toro).



Descriptive notes. 11-12 cm; male 18·8, female (some possibly during egg-laying) 20·9 g. Male has black cap, rest of head and forebody (to upper back and upper breast) white, throat feathers elongated (projected forwards well beyond bill tip in display); black central back, wings and tail, olive lower back to uppertail-coverts; outer primaries thin and curved, secondaries with thickened shafts; yellow from lower breast downwards; iris dark brown; bill blackish; legs orange. Female is olive-green, yellower on belly. Juvenile resembles female; immature male has pale grey throat and upper chest, may acquire full adult plumage at c. 1 year. Voice. Male calls at lek a rolling "preew" or double "prrr-weeu", first note rolling, second note clear; also loud wing-snaps during display.
Habitat. Edges of humid evergreen forest, secondary woodland and thickets, locally cocoa and other plantations; sea-level to 700 m.
Food and Feeding. Small fruits and insects, plucked or snatched from vegetation in aerial sally.
Breeding. Apr-Aug in Costa Rica. Male displays with others at lek, each clearing a small "court" in which several vertical stems present, displays involve mainly jumps between stems with "about-face" on landing, also occasional crouching with head retracted, body swaying and wings beating, and with throat feathers projected forwards; when female visits, both sexes perform co-ordinated to-and-fro jumps between mating stem and an adjacent one, the two crossing in mid-air, female finally landing on mating perch, male then giving pre-mating display involving jump to ground, leap up to mating stem and slide down stem. Nest a shallow cup of black fungal rhizomorphs and fine brown fibres, often lined with filamentous *Myriocarpa* inflorescences, these sometimes dangling below for up to 1·2 m, outside usually decorated with green moss, suspended in horizontal fork. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Fairly common to common throughout range. Has quite wide habitat tolerance; does not require undisturbed primary forest.
Bibliography. Angehr (2003), Bangs (1903), Beletsky (1998, 1999), Binford (1989), Bostwick & Prum (2003), Brodkorb (1943), Brumfield *et al.* (2001), Butlin & Neems (1994), Cooper (1997), Dearborn (1907), Eisenmann (1955), Fogden (1993), González-García (1993), Haffer (1967), Hellmayr (1929), Henderson (2002), Herrera-Rosales (1998), Horwich (1990), Howell, S.N.G. & Webb (1995a), Howell, T.R. (1957), Land (1970), Lee Jones (2004), Levey (1987), Levey & Stiles (1994), McDonald *et al.* (2001), Monroe (1968), Parker (1993a), Parsons *et al.* (1993, 1994), Paynter (1955), Ridgely & Gwynne (1989), Ridgway (1907), Selvin & Castillo (2000), Slud (1960, 1964), Smithe (1966), Stiles (1983, 1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Van Tyne (1935).

30. Orange-collared Manakin

Manacus aurantiacus

French: Manakin à col orange **German**: Orangebandpipra **Spanish**: Saltarín Cuellinaranja

Taxonomy. *Chiromachaeris aurantiaca* Salvin, 1870, Mina de Chorcha and Bugaba, Chiriquí, Panama.
Genus possibly closest to *Chiroxiphia* and *Antilophia*. Its four members form a superspecies, and all sometimes treated as conspecific under the name *M. manacus*. Alternatively, present species has been considered by some to be conspecific only with *M. vitellinus*. Monotypic.
Distribution. Pacific lowlands and foothills of S Costa Rica and SW Panama.
Descriptive notes. 9·5-10 cm; 15·5 g. Male has black cap, rest of head and forebody (to upper back and upper breast) orange to golden-orange, throat feathers elongated (projected forwards slightly beyond bill tip in display); black central back, black wings and tail with some olive admixed, olive lower back to uppertail-coverts; outer primaries very thin and stiff, secondaries with thickened shafts and stiff outer webs; yellow with some admixed olive from lower breast downwards; iris



dark brown; bill blackish; legs reddish-orange. Female is olive above, more yellowish below, breast and flanks olive-green. Juvenile resembles female, but legs paler; immature male has golden tinge on breast. Voice. Male call at lek a clear "cheeu"; loud wing-snaps during display.
Habitat. Humid forest, neighbouring second-growth woodland and taller thickets, locally also shady plantations; lowlands to 1100 m.
Food and Feeding. Small fruits and insects, seized in aerial sally. Regularly forages above army ants.
Breeding. Egg-laying in Mar-Sept, mainly Mar-Jun, in S Costa Rica. Male displays at lek with others, each clearing a small "court" in which several vertical stems present, displays mainly by jumping between stems with "about-face" on landing, also occasional crouching with head retracted, body swaying and wings beating, and with throat feathers projected forwards; when female visits, both sexes perform co-ordinated jumps back and forth between mating stem and an adjacent one, crossing in mid-air, female finally landing on mating perch, male then giving pre-mating display involving jump to ground, leap up to mating stem and slide down stem. Nest a shallow cup, usually light in colour, made of fine filaments, strips of bark, rootlets and bast fibres, rarely with any pieces hanging below; suspended in horizontal fork, and bound to it with cobwebs, mostly 0·6-2·5 m above ground, rarely to 5·5 m. Clutch 2 eggs; incubation 18 to nearly 20 days; fledging usually 13-15 days.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Locally common to fairly common. Has declined considerably in much of Panama as a result of deforestation; possibly still fairly numerous in parts of W Chiriquí. Able to survive in secondary and degraded habitats, but disappears from areas where most of vegetation cleared.
Bibliography. Angehr (2003), Bostwick & Prum (2003), Delgado (1985), Eisenmann (1955), Engleman (1996b), Hellmayr (1929), Ridgely & Gwynne (1989), Ridgway (1907), Sekercioglu *et al.* (2002), Skutch (1969), Slud (1964), Stiles (1983, 1985), Stiles & Skutch (1989), Wetmore (1972).

31. Golden-collared Manakin

Manacus vitellinus

French: Manakin à col d'or **German**: Goldbandpipra **Spanish**: Saltarín Cuellidorado
Other common names: Greenish-bellied Manakin (*viridiventris* and *milleri*); Almirante Manakin ("*M. cerritus*")

Taxonomy. *Pipra vitellina* Gould, 1843, Panama City, Panama.
Genus possibly closest to *Chiroxiphia* and *Antilophia*. Its four members form a superspecies, and all sometimes treated as conspecific under the name *M. manacus*. Alternatively, present species has been considered by some to be conspecific only with *M. aurantiacus*. Hybridizes with *M. candei* in Panama (Bocas del Toro), where hybrid forms have been treated as a distinct species, *M. cerritus*; hybridizes also with *M. manacus* in Colombia (lower Cauca Valley, also SW Cauca). Four subspecies recognized.
Subspecies and Distribution.
M. v. vitellinus (Gould, 1843) - Panama (E from Bocas del Toro) and NW Colombia (N Chocó, and N Antioquia around Golfo de Urabá).
M. v. amitinus Wetmore, 1959 - Escudo de Veraguas I, off N Panama (Bocas del Toro).
M. v. milleri Chapman, 1915 - N Colombia in valleys of Sinú and lower Cauca.
M. v. viridiventris Griscom, 1929 - W Colombia W of W Andes (S to SW Cauca), also on E side in upper Cauca Valley.



Descriptive notes. 10-11 cm; male 19·3 g, female 17·1 g. Male nominate race has black cap, golden-yellow on rest of head, upper mantle, shoulders, and chin to breast, throat feathers elongated (projected forwards well beyond bill tip in display); black back, wings and tail, olive lower back; four outermost primaries very narrow and stiff, secondaries with unusually thick shafts and stiff outer webs; lower underparts pale olive; iris dark brown; bill blackish; legs reddish-orange. Female has dull olive head and upperparts, paler and more olive-yellow below. Juvenile resembles female. Races differ mainly in size and in intensity of male coloration: *amitinus* is noticeably larger than others; *milleri* resembles nominate; *viridiventris* has brighter lemon-yellow throat. Voice. Male calls at lek a slightly trilled "peerr" and a clear "cheepooh"; also loud wing-snaps during display.
Habitat. Forest borders and secondary woodland, also dense regenerating clearings; lowlands and foothills, to 450 m in Panama, to 1200 m in Colombia.
Food and Feeding. Small fruits and insects, plucked or snatched in short aerial sallies.
Breeding. Egg-laying in Feb-Aug in Panama; in Colombia Feb-May in N (Chocó, N Antioquia), probably Jul in S (Valle). Male displays with others at lek, each clearing a small "court" in which several vertical stems present, displays mainly by jumping between stems with "about-face" on landing, also occasional crouching with head retracted, body swaying and wings beating, and with throat feathers projected forwards; when female visits, both sexes perform co-ordinated to-and-fro jumps between mating stem and an adjacent one, crossing in mid-air, female finally landing on mating perch, male then jumping to ground, leaping back up to mating stem and sliding down it. Nest a thinly woven shallow cup of rootlets and fungal hyphae, lined with finer material, slung between horizontal supports, and secured with cobweb, 0·6-1·5 m above ground. Clutch 2 eggs; incubation period not documented; fledging period 13-15 days.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. The most abundant manakin over much of its range. Common in most of Panama, including both sides of Canal area; very common to common throughout Colombian range.
Bibliography. Angehr (2003), Bartholomew *et al.* (1983), Brumfield *et al.* (2001), Bucher & Worthington (1982), Butlin & Neems (1994), Chapman (1915, 1935), Cracraft (1985), Eisenmann (1955), Haffer (1967, 1975), Hellmayr (1929), Hilty (1997), Hilty & Brown (1986), McDonald *et al.* (2001), Meyer de Schauensee (1982), Moermond & Denslow (1985), Parsons *et al.* (1993, 1994), Piertney *et al.* (2002), Ridgely & Gwynne (1989), Ridgely & Tudor

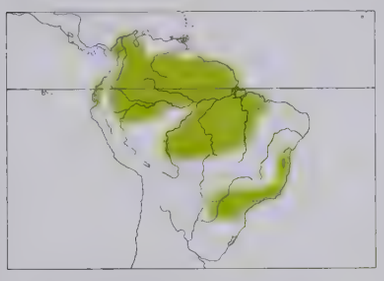
(1994), Ridgway (1907), Robbins *et al.* (1985), Saldanha *et al.* (2000), Schlinger *et al.* (2001), Schultz *et al.* (2001), Sick (1960), Snow (1962a), Stotz *et al.* (1996), Wetmore (1972), Willis & Eisenmann (1979), Worthington (1982a, 1982b, 1983, 1989).

32. White-bearded Manakin

Manacus manacus

French: Manakin casse-noisette **German**: Weißbrustpipra **Spanish**: Saltarín Barbiblanco
Other common names: Bearded Manakin (when all congeners considered conspecific)

Taxonomy. [*Pipra*] *manacus* Linnaeus, 1766, Surinam.
Genus possibly closest to *Chiroxiphia* and *Antilophia*. Its four members form a superspecies, and all sometimes treated as conspecific. Present species hybridizes with *M. vitellinus* in Colombia (lower Cauca Valley, also SW Cauca). Almost all geographical variation probably clinal, and some described races perhaps not tenable; full revision of taxonomy desirable. Fifteen subspecies recognized.
Subspecies and Distribution.
M. m. abditivus Bangs, 1899 - N Colombia (Santa Marta region, lower Cauca Valley, lower and middle Magdalena Valley).
M. m. flaveolus Cassin, 1851 - upper Magdalena Valley (C Colombia).
M. m. bangsi Chapman, 1914 - SW Colombia (S from SW Cauca) and extreme NW Ecuador (N Esmeraldas, Imbabura).
M. m. leucochlamys Chapman, 1914 - NW & W Ecuador (W Esmeraldas and Pichincha S to N Guayas).
M. m. maximus Chapman, 1924 - SW Ecuador (E Guayas and extreme W Chimborazo S to W Loja) and extreme NW Peru (Tumbes).
M. m. interior Chapman, 1914 - NW & SC Venezuela, Colombia E of Andes, E Ecuador, NE Peru, and NW Brazil (on upper R Negro).
M. m. trinitatis (Hartert, 1912) - Trinidad.
M. m. umbrosus Friedmann, 1944 - limited area of S Venezuela in C Amazonas.
M. m. manacus (Linnaeus, 1766) - the Guianas, S Venezuela (R Casiquiare region, in S Amazonas), and NE Brazil N of lower Amazon.
M. m. expectatus Gyldenstolpe, 1941 - W Brazil (R Juruá), possibly also adjacent NE Peru (E Loreto).
M. m. subpurus Cherrie & Reichenberger, 1923 - SC Brazil.
M. m. purus Bangs, 1899 - S bank of lower Amazon in Brazil (R Madeira probably to left bank of R Xingu).
M. m. longibarbatus J. T. Zimmer, 1936 - S bank of lower Amazon in Brazil (right bank of R Xingu E to right bank of R Tocantins).
M. m. purissimus Todd, 1928 - E Brazil from right bank of R Tocantins E to N Maranhão.
M. m. gutturosus (Desmarest, 1806) - E & SE Brazil (Alagoas, Bahia and Minas Gerais S to extreme SE Mato Grosso, Santa Catarina and extreme N Rio Grande do Sul), SE Paraguay and extreme NE Argentina (Misiones).



Descriptive notes. 10-11 cm; male 18·3 g, female 16·5 g (*trinitatis*), male 17·5 g, female 16 g (*manacus*, French Guiana), male 16·4 g, female 15·4 g (*manacus*, Surinam), male 15·7 g, female 14·8 g (*subpurus*). Male nominate race has black cap, back, wings and tail; rest of plumage mostly white, rump and uppertail-coverts grey, flanks and belly tinged grey; throat feathers elongated (projected forwards well beyond bill tip in display); four outermost primaries very narrow and stiff (instrumental in producing grasshopper-like whirring in flight), secondaries with unusually thick shafts and stiff outer webs (producing loud snaps during display); iris dark brown; bill blackish, cutting edges and lower mandible often paler (grey); legs reddish-orange. Female is olive above, greyer and paler below, especially on throat and belly; differs from females of congeners in having less yellowish underparts. Juvenile resembles female; immature male acquires some adult-like feathers after a few months, gains full adult plumage when just over 1 year old. Races vary mainly in size, in width of white collar of male and in extent of grey in underparts: *abditivus* has throat feathers very long and stiff; *flaveolus* has throat and collar tinged creamy yellow; *bangsi* is small, grey-bellied, with narrow white collar; *leucochlamys* differs from last in broader white mantle, white belly; *maximus* is like previous but larger throughout, white feathers of throat and mantle longer; *interior* has rump and lower underparts paler grey than nominate; *umbrosus* differs from last in having grey areas much darker; *trinitatis* is large, has broadest white collar, female yellower below; *expectatus* is much smaller than last; *subpurus* has rump rather dark grey, faint greyish wash on breast and abdomen, more extensive darker grey on sides and flanks, white undertail-coverts; *purus* differs from previous in having less black on back, paler grey rump, no grey wash on breast, paler and less extensive grey on flanks; *longibarbatus* is similar to nominate but throat feathers longer, white on mantle broader and purer white, grey of rump on average broader, median (sometimes also greater) upperwing-coverts white subterminally, lower belly and thighs paler grey; *purissimus* is like previous but throat feathers shorter, lower belly and thighs more whitish, wing longer, outer primary broader; *gutturosus* has darkest and most extensive grey below, extending from breast to vent. Voice. Male calls at lek a rather plaintive, slightly trilled "peerr", changing in excitement to a louder, high-pitched "chwee", and distinct disyllabic "chee-poo" at start of display bout; also loud wing-snaps.
Habitat. Forest edges, especially where woody undergrowth is thick, also low shrubby forest and secondary woodland. Mainly below 1000 m, often lower, below 800 m; old records from 1300 m in SW Ecuador (W Loja). Marked preference for nesting beside, or even over, woodland streams.
Food and Feeding. Mainly small fruits, also insects. In Trinidad study area, fruits of 105 plant species, from 27 families, recorded as eaten; Melastomataceae the most important family, followed by Rubiaceae. Insects include beetles (Coleoptera), flies (Diptera) and alate termites (Isoptera); proportionately more insects fed to young than eaten by adults themselves. Fruits plucked in flight, but sometimes, if accessible, from perched position; insects snatched from vegetation in flight, mostly at low levels. Not uncommonly follows army ants, taking insects disturbed by them.
Breeding. In Trinidad, egg-laying in Jan-Sept (exceptionally, Dec), peak May-Jun, month of starting varying annually, and up to five breeding attempts in single season; breeding recorded in Jan, Mar and Aug in Surinam; in Brazil, Aug-Apr in N (Belém area) and Dec in SE. Male displays at lek, in compact group with up to 50 or more others, each clearing a small, roughly circular "court" in which usually 2-4 vertical stems present, display repertoire of three distinct elements, all with long throat feathers projected forwards, commonest one being jumps between stems with "about-face" on landing, less often jump to ground and back up to stem, and crouching with head retracted, body swaying and wings beating and fanned; when female visits, both sexes perform co-ordinated to-and-fro jumps between mating stem and an adjacent one, the two crossing in mid-air, female finally landing on mating perch, male then giving stereotyped sequence of jump to ground, leap back up to mating stem and slide down stem on to female's back. Nest a thinly woven shallow cup made of rootlets, black fungal hyphae and occasionally dead leaves, inner lining of fine plant material (mainly very fine-branching fruit panicles of the melastome *Nepsera aquatica* in Trinidad and Belém area); slung between horizontal supports and secured with cobweb, mainly 0·5-1·5 m above ground, usually beside or overhanging woodland stream. Clutch 2 eggs; incubation period 18-19 days; fledging period 13-15 days. Nesting success low: in Trinidad study, of 227 nests in which eggs laid, 19% produced fledged young, with average of 0·33 fledglings per nest for all nesting attempts.
Movements. Resident. In radio-tracking study in French Guiana, adults largely sedentary when breeding, moving over larger area (probably of several hundred hectares) during moult period; immature males wandered over ranges of 20·1 ha and 20·3 ha.
Status and Conservation. Not globally threatened. Common in many parts of its wide range, but more local in areas of extensive unbroken forest. Common in Trinidad; common in N & C parts of Colombia, less numerous towards S; fairly common in Ecuador; common in NE Peru but rare in NW. In French Guiana during breeding season, home ranges of two adult males were 2·1 ha and 2·5 ha (centred on single display area and bathing site), and of two females 13 ha and 14·1 ha (including several male display areas and bathing sites).
Bibliography. Allen (1961), Bangs (1899), Berres (2002), Best *et al.* (1997), Blake (1962), Bloch *et al.* (1991), Borgia *et al.* (1985), Bostwick & Prum (2003), Breitwisch & Pliske (1974), Brooks *et al.* (1993), Brumfield & Braun (2001), Butler (1979), Canevari *et al.* (1991), Capper *et al.* (2000), Castro Astor *et al.* (1998), Chapman (1894, 1914), Chebez (1994), Chebez *et al.* (1999), Cohn-Haft *et al.* (1997), ffrench (1986, 1991), Fraga & Narosky (1985), Friedmann (1948), Galetti & Pizo (1996), Guix (1995), Gyldenstolpe (1941), Haffer (1967, 1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hellmayr (1929), Herklots (1961), Hilty (2003), Hilty & Brown (1986), Keast (1985), Lill (1974, 1975), Lowen *et al.* (1996), Mallorquín & Quevedo (2002), Meyer de Schauensee (1982), Murphy (1995), Narosky & Yzurieta (1993), Navas & Bó (1988), Olson & McDowell (1983), Oniki & Willis (1983a), Oren & Parker (1997), Ortiz & Carrión (1991), de la Peña (1989), Piratelli *et al.* (2002), Pople *et al.* (1997), Reynaud (1998), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), do Rosário (1996), Rutger & Norris (1977), Schubart *et al.* (1965), Shorey (2002), Shorey *et al.* (2000), Sick (1960, 1993, 1997), Snow (1962a), Snyder (1966), Stotz, Fitzpatrik *et al.* (1996), Stotz, Lanyon *et al.* (1997), Théry (1990c, 1992, 1997), Tobias *et al.* (1993), Tostain *et al.* (1992), White (2002), Wiedenfeld *et al.* (1985), Williams & Tobias (1994), Zimmer & Hilty (1997), Zimmer *et al.* (1997).



PLATE 14

inches 2
cm 5

Genus *MACHAEROPTERUS* Bonaparte, 1854

33. Fiery-capped Manakin

Machaeropterus pyrocephalus

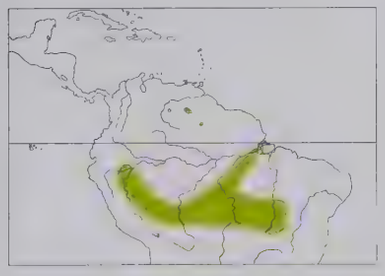
French: Manakin tête-de-feu **German**: Feuerkopfpipra **Spanish**: Saltarín Encendido

Taxonomy. *Pipra pyrocephala* P. L. Sclater, 1852, locality unknown = Ucayali, upper Amazon, Peru.
Two subspecies recognized.

Subspecies and Distribution.

M. p. pallidiceps J. T. Zimmer, 1936 - S Venezuela (lower Caura Valley and middle Caragua Valley, in Bolívar, also single record from NW Amazonas) and extreme N Brazil (N Roraima).

M. p. pyrocephalus (P. L. Sclater, 1852) - widely scattered localities in E Peru, N Bolivia and Amazonian Brazil (mainly in S, E to S Amapá and Goiás).



Descriptive notes. 8-9 cm; 9-8 g. Male has golden cap and nape with red median stripe, rest of upperparts rosy rufous to maroon; auriculars, tail and most of wing olive, some whitish on inner secondaries, series of black spots on tertials (conspicuous in display); inner secondaries somewhat twisted; tail feathers short and pointed, with thickened rachi; throat whitish, rest of underparts streaked dull pink and whitish; iris dark red; bill blackish, paler base of lower mandible; legs pinkish to purplish-flesh. Female is olive above, pale greyish on throat, pale and dull olive with blurry streaking below, belly tinged yellowish. Juvenile resembles female; immature male usually has some golden-yellow on forecrown. Race *pallidiceps* male has yellow of head paler and median stripe much less prominent than in nominate. Voice. Male advertising call a high-pitched bell-like or frog-like "pling", usually at long intervals; in display, a mechanical loud wing noise, "zssssss", produced by modified secondaries; in flight, rattling mechanical sound like that of large beetle (Coleoptera).

Habitat. Humid forest and mature secondary woodland, also forest borders; transitional forest apparently favoured in some area, e.g. SE Peru (Madre de Dios). To c. 1200 m, mostly lower; 100-200 m in Venezuela.

Food and Feeding. Small fruits (especially of Melastomataceae) and insects, plucked or snatched in flight.

Breeding. Nest found in Mar in Venezuela. Male displays at "exploded" lek, within hearing distance of others, often accompanied by one other male, hangs downwards from slender horizontal perch and twists so rapidly from side to side that it becomes a blur. Single known nest, of race *pallidiceps*, a small cup lined with coarse fibres, dead leaves woven on to outside, c. 1 m above ground in horizontal fork of sapling; contained 2 eggs.

Movements. Presumably resident.

Status and Conservation. Not globally threatened. Apparently uncommon, but very easily overlooked in forest understorey. Very local in occurrence throughout range; in Venezuela, for example, recorded only from a few sites on lower R Caura and two places on middle R Paragua, with single record of subadult male in NW Amazonas (c. 20 km E of Puerto Ayacucho). Occurs in a number of protected areas, including Maracá Ecological Station (Roraima), Chapada dos Guimarães National Park and Rio Cristalino Forest Reserve (Mato Grosso), all in Brazil, Tambopata-Candamo Reserved Zone and Amazonia Lodge, in Peru, and also Noel Kempff Mercado National Park, in Bolivia.

Bibliography. Acheson & Davis (2001), Allen (1995), Bates & Parker (1998), Bradshaw & Kirwan (1995), Dubs (1992), Forrester (1993), Hellmayr (1929), Hilty (2003), Meyer de Schauensee (1982), Novaes (1978a), Oren & Parker (1997), Parker & Hoke (2002), Parker, Donahue & Schulenberg (1994), Parker, Kratter & Wust (1994), Parker, Schulenberg & Wust (1994), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Sick (1967, 1993, 1997), Stotz *et al.* (1996), Terborgh *et al.* (1984), Traylor (1958), Willis & Oniki (1990), Zimmer & Hilty (1997).

34. Western Striped Manakin

Machaeropterus striolatus

French: Manakin strié **Spanish**: Saltarín Rayado Occidental
German: Westliche Streifenbauchpipra
Other common names: Striped Manakin (when treated as conspecific with *M. regulus*)

Taxonomy. *Pipra striolata* Bonaparte, 1838, lower River Javarí, west Brazil.
Formerly treated as conspecific with *M. regulus*, but differs markedly in voice and, to lesser extent, in plumage. Five subspecies recognized.

Subspecies and Distribution.

M. s. zulianus Phelps, Sr & Phelps, Jr, 1952 - NW Venezuela (Zulia, and NW Barinas S to Táchira).

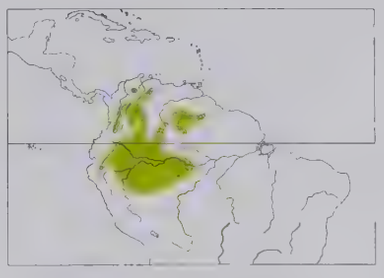
M. s. obscurostriatus Phelps, Sr & Gilliard, 1941 - W Trujillo and W Mérida, in NW Venezuela.

M. s. antioquiae Chapman, 1924 - W & C Colombia.

M. s. striolatus (Bonaparte, 1838) - E Colombia, E Ecuador, NE Peru (S to N Ucayali) and adjacent W Brazil (E to region of R Urucu, in C Amazonas).

M. s. aureopectus Phelps, Sr & Gilliard, 1941 - SE Venezuela and adjacent W Guyana.

Descriptive notes. 9-9·5 cm; 9·4 g. Male nominate race is olive above, with red cap and nape; secondaries stiffened and enlarged, with white tips; tail also stiffened, with thick rachi; throat whitish; rest of underparts reddish-chestnut, redder on chest side, with whitish shaft streaks; iris dark red-brown; upper mandible blackish, lower mandible paler; legs purplish-flesh. Differs from *M. regulus* in darker-looking underparts, reddish colour on chest. Female lacks red on head, is entirely olive above, dingy whitish below, breast and sides pale olive with fine whitish streaks, breast side tinged brownish. Juvenile resembles female. Races vary mainly in darkness and width of streaking below on male, also colour of staining across upper breast: *antioquiae* is similar to nominate but white streaks below on average broader, also male crown darker or duller, upperparts more yellow-tinged; *zulianus* has breast stained crimson; *obscurostriatus* has white shaft streaks below broader, feather edgings darker, only few crimson streaks, rump tinged yellowish; *aureopectus* is closest to previous but has distinct yellowish breastband. Voice. Male advertising call evidently geographically variable, in Venezuela a soft, sharply enunciated "pik-sink", in E Colombia a fast series of high-pitched notes followed by short buzz, "whit whit whit whit skeeezz", in W Brazil (upper R Juruá) a soft, insect-like "whoo-cheet"; during display, whirring sound produced by modified secondaries.



Habitat. Inhabits humid forest and mature secondary woodland, occasionally venturing out to forest borders. Lowlands to middle elevations, to 1500 m in Colombia; 100-1200 m (mostly above 300 m) in Venezuela, and to c. 1100 m in S Ecuador (but below 700 m in N) and to 1300 m in Peru.

Food and Feeding. Small fruits and insects, taken in rapid aerial sallies.

Breeding. No information on season or nest. Male displays at small "exploded" lek, probably within hearing distance of others; when female present, makes vertical jumps with vibrating wings, may also revolve rapidly around and beneath perch.

Movements. Resident.

Status and Conservation. Not globally threatened. Generally uncommon to locally fairly common. Fairly common but very local in Venezuela, rare in Guyana; very local in Colombia; uncommon to fairly common but apparently local in Ecuador and Peru. Easily overlooked when not calling. Occurs in Tayrona National Park, in Colombia, and Podocarpus National Park, in Ecuador.

Bibliography. Agro & Ridgely (1998), Balchin & Toyne (1998), Best *et al.* (1997), Blake (1962), Butler (1979), Chapman (1917c), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Iafrancesco *et al.* (1987), Peres & Whittaker (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Sick (1967, 1993, 1997), Whittaker & Oren (1999).

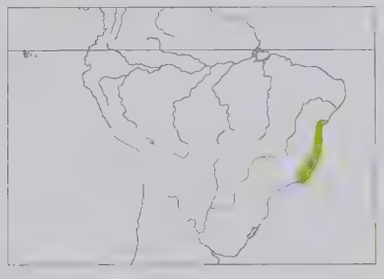
35. Eastern Striped Manakin

Machaeropterus regulus

French: Manakin rubis **Spanish**: Saltarín Rayado Oriental
German: Östliche Streifenbauchpipra
Other common names: Striped Manakin (when treated as conspecific with *M. striolatus*)

Taxonomy. *Pipra regulus* Hahn, 1819, Bahia, Brazil.
Formerly treated as conspecific with *M. striolatus*, but differs markedly in voice and, to lesser extent, in plumage; there is some evidence that it may be more closely related to *M. pyrocephalus*. Monotypic.

Distribution. SE coastal Brazil, from Bahia S to Rio de Janeiro.



Descriptive notes. 9-9·5 cm. Male is olive above, with red forehead to nape; secondaries stiffened and enlarged, with white tips; tail also stiffened, with thick rachi; throat whitish; underparts whitish, slight yellow wash on upper breast, feathers narrowly edged red-brown on outer sides; iris dark red-brown; upper mandible blackish, lower mandible paler; legs purplish-flesh. Differs from *M. striolatus* in having whiter underparts, no red on chest. Female is similar to male but no red on head, and dark streaks on underparts restricted to belly and, especially, flanks. Juvenile resembles female. Voice. Male advertising call a very fast metallic buzzing, shorter and repeated more quickly than call of *M. striolatus*.

Habitat. Humid lowland forest.

Food and Feeding. No details recorded.

Breeding. No information on season or nest. Male displays in presence of another, by hanging head downwards from side of thin vertical stem and turning very rapidly to and fro, also extends wings, fans and shakes tail, spreads crown feathers.

Movements. Presumably resident.

Status and Conservation. Not globally threatened. Very poorly known. Its population has undoubtedly been much reduced by extensive destruction of Atlantic coastal forest. Conservation status not officially assessed, as taxonomic status only recently upgraded to that of a full species. Should probably be categorized as Vulnerable.

Bibliography. Cracraft (1985), Forrester (1993), Hellmayr (1929), Mazar Barnett & Kirwan (1998a), Meyer de Schauensee (1982), Pacheco & Bauer (2001), Pearman (1994b), Ridgely & Tudor (1994), Sargeant & Wall (1996), Sick (1967, 1993, 1997), Stotz *et al.* (1996), Whittaker & Oren (1999).

36. Club-winged Manakin

Machaeropterus deliciosus

French: Manakin à ailes blanches **German**: Keulenschwingenpipra **Spanish**: Saltarín Alitorcido

Taxonomy. *Pipra deliciosa* P. L. Sclater, 1860, Nanegal, Pichincha, Ecuador.
Formerly placed in a monotypic genus *Allocotopterus* on basis of highly modified secondaries, but now considered better merged with present genus, other members of which (*M. pyrocephalus*, *M. striolatus*, *M. regulus*) exhibit similar, though less extreme, modifications. Monotypic.

On following pages: 37. Black Manakin (*Xenopipo atronitens*); 38. Jet Manakin (*Chloropipo unicolor*); 39. Olive Manakin (*Chloropipo uniformis*); 40. Green Manakin (*Chloropipo holochlora*); 41. Yellow-headed Manakin (*Chloropipo flavicapilla*); 42. Flame-crested Manakin (*Heterocercus linteatus*); 43. Yellow-crested Manakin (*Heterocercus flavivertex*); 44. Orange-crested Manakin (*Heterocercus aurantiivertex*).

Distribution. W slope of Andes in SW Colombia (S from Risaralda) and W Ecuador (S to Pichincha, also in El Oro and W Loja).



Descriptive notes. 9·5-10 cm; 1 female 12 g. Distinctive manakin, male with greatly modified secondaries. Male has scarlet forehead and crown, dusky eyestripe; rest of body mostly chestnut-brown, paler on head and throat, darker on belly, some white admixed on flanks; blackish rump and uppertail-coverts; scapulars, wings and tail black, wings with much white, especially on inner secondaries; secondaries peculiarly modified, progressively from outermost to S7, then decreasingly from S8 to S10, being thickened, twisted, and bent at tip, the most modified having hollow club-shaped end; iris dark brown; bill black; legs greyish-flesh, sometimes purplish. Female is olive above, face with cinnamon tinge, whitish throat, yellowish-olive breast and flanks, pale yellow belly. Juvenile resembles female. VOICE. Male call at lek a high-pitched "seet" or "seet-seet" followed by up to 8 loud, strident "keah!" notes; during display a mechanical wing noise, "tip-tip-beeuwww", final note with ringing quality, produced by vibration of hollow club-shaped tips of secondaries.
Habitat. Wet montane forest, especially where mossy, also mature secondary woodland. Mostly 600-1900 m, to 1600 m in Ecuador; locally lower in non-breeding season, down to 100 m in Ecuador.
Food and Feeding. Small berries and insects, plucked and taken from twigs and leaves in aerial sallies. Occasionally accompanies mixed-species flocks.
Breeding. Egg-laying in Mar-Aug in Colombia. Male displays solitarily, but often within hearing distance of others, on thin branch up to c. 7 m above ground, flutters wings rapidly downwards and then holds them raised high, producing mechanical sound described above. Nest a small cup of vegetable fibres, covered on outside with moss, slung in horizontal fork of shrub at 0·5-1·2 m above ground. Clutch 2 eggs; incubation and fledging periods not recorded.
Movements. Resident. Apparently seasonal altitudinal movements in Ecuador, descending to c. 100 m during non-breeding (dry) season.
Status and Conservation. Not globally threatened. Restricted-range species: present in Chocó EBA. Uncommon to fairly common but local, or very local, within relatively small range; occurs in Río Ñambí and La Planada Nature Reserves (Colombia). Has possibly extended its range in Ecuador; recorded since 1988 in El Oro (Buenaventura), where apparently absent previously. Dependent on conservation of adequate forest at upper tropical and subtropical levels.
Bibliography. Allen (1998), Best *et al.* (1997), Bostwick (2000), Bostwick & Prum (1998), Butler (1979), Chapman (1917c), Cracraft (1985), Hellmayr (1929), Hilty (1997), Hilty & Brown (1986), Meyer de Schauensee (1982), Orejuela *et al.* (1982), Ortiz & Carrión (1991), Ramírez & Arias (1995), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Snow (1975a), Stotz *et al.* (1996), Willis (1966).

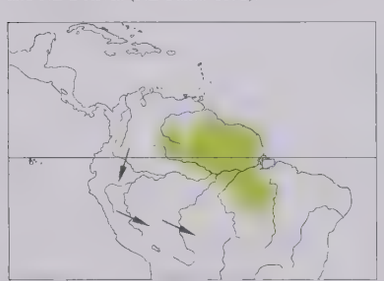
Genus *XENOPIPO* Cabanis, 1847

37. **Black Manakin**

Xenopipo atronitens

French: Manakin noir **German**: Schwarzpipra **Spanish**: Saltarín Negro

Taxonomy. *Xenopipo atronitens* Cabanis, 1847, Guyana.
Genus closely related to *Chloropipo*, which sometimes merged with it, but the single species in present genus differs in being much more vocal. Monotypic.
Distribution. Extreme E Colombia, S & SE Venezuela, the Guianas, and Amazonian Brazil (R Negro drainage E to Amapá and R Araguaia); isolated records in E Peru (Loreto, Madre de Dios) and NE Bolivia (NE Santa Cruz).



Descriptive notes. 12-13 cm; 12·5-18 g. Relatively long-tailed manakin with rather heavy bill, recalling a tyrant-flycatcher (Tyrannidae), tanager (Thraupidae) or even small finch (Fringillidae). Male is glossy black, slightly duller and browner on wings and tail; iris dark brown; bill pale bluish-grey; legs dark olive-grey. Female is dark olive above, yellowish-olive below, throat greyish, upper mandible blackish. Juvenile apparently undescribed. VOICE. Calls numerous and varied, loud and sharp; include "skee! kip-kip-kip-krrr", with many variations, and a dry, rattling "trrrrrrrrrup".
Habitat. Scrubby savanna woodland and thickets, stunted *várzea* forest, also gallery woodland; frequently in areas with white sandy soils, almost exclusively so in Venezuela. To 1200 m, mostly below c. 700 m.
Food and Feeding. Small fruits and insects, taken in aerial sally. Regularly accompanies mixed-species foraging flocks.
Breeding. Not recorded. Male display unspectacular, no more than calling and chasing.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally considered to be locally common to fairly common in suitable habitat, but patchily distributed. Rare and local in heavily forested regions; thus only three records from French Guiana, although rather common in adjacent Surinam. Isolated records from SE Peru (Pampas del Heath, in Madre de Dios) and NE Bolivia (Serranía de Huanchaca, in NE Santa Cruz) suggest that range is probably more extensive than is currently realized.
Bibliography. Bangs & Penard (1918), Bates & Parker (1998), Borges *et al.* (2000), Friedmann (1948), Graham *et al.* (1980), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Oren & Parker (1997), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1960, 1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Zimmer & Hilty (1997).

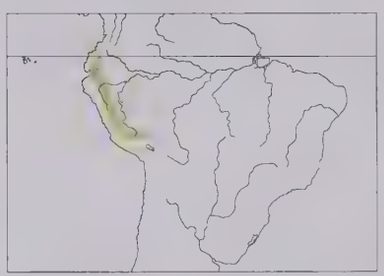
Genus *CHLOROPIPO* Cabanis & Heine, 1859

38. **Jet Manakin**

Chloropipo unicolor

French: Manakin unicolore **German**: Atlaspipra **Spanish**: Saltarín Azabache

Taxonomy. *Chloropipo unicolor* Taczanowski, 1884, Amable María, Peru.
Genus closely related to *Xenopipo* and sometimes merged with it, but differs in having far less extensive vocal repertoire. Monotypic.
Distribution. Upper tropical zone of E slope of Andes in Ecuador (S from W Napo) and Peru (S to Puno).



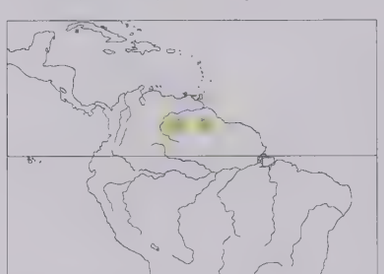
Descriptive notes. 12 cm; 15·5 g. Male is black, with white underwing-coverts; iris dark brown; bill bluish-grey to grey, or darker with pale base of lower mandible; legs dark olive-grey to pinkish-grey. Female is dark olive with vague pale eyering, greyish on throat and belly. Juvenile undescribed. VOICE. Call a down-slurred whistle, "peeeeer".
Habitat. Montane forest; recorded at elevations of 1450-1700 m in Ecuador, and 930-1900 m in Peru.
Food and Feeding. No information.
Breeding. Not recorded.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Very poorly known. Apparently uncommon to fairly common, but inconspicuous and rarely observed; in some areas not infrequently captured in mist-nets.
Bibliography. Best *et al.* (1997), Clements & Shany (2001), Cracraft (1985), Hellmayr (1929), Mee *et al.* (2002), Meyer de Schauensee (1982), Parker *et al.* (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rodner *et al.* (2000), Schulenberg & Wust (1997), Schulenberg *et al.* (2001), Stotz *et al.* (1996).

39. **Olive Manakin**

Chloropipo uniformis

French: Manakin olive **German**: Tepuipipra **Spanish**: Saltarín Oliváceo

Taxonomy. *Chloropipo uniformis* Salvin and Godman, 1884, Mount Roraima, Venezuela.
Genus closely related to *Xenopipo* and sometimes merged with it, but differs in having far less extensive vocal repertoire. Two subspecies recognized.
Subspecies and Distribution.
C. u. duidae Chapman, 1929 - cerros Duida and Sipapo, in Amazonas, SC Venezuela.
C. u. uniformis Salvin & Godman, 1884 - SE Venezuela (various mountains in S Bolívar), adjacent N Brazil (Cerro Uei) and W Guyana.



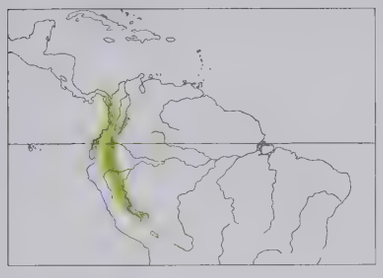
Descriptive notes. 13·5 cm; male 18-21 g, female 16·5-21 g. Rather long-winged manakin with relatively long and narrow tail. Plumage is rather dark olive, slightly paler on throat, and slightly paler with yellowish cast on belly and on indistinct eyering; underwing-coverts whitish; iris, bill and legs dark. Sexes similar. Juvenile resembles adult. Race *duidae* is slightly smaller and brighter than nominate. VOICE. Advertising call a clear, rising whistle, "preeeeeeeeé", penetrating but not loud.
Habitat. Stunted montane woodland and humid forest; 800-2100 m. Most frequent in areas dominated by melastomes (Melastomataceae).
Food and Feeding. Small fruits; presumably also insects.
Breeding. Not recorded.
Movements. Resident. Possibly some seasonal elevational movements.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tepuis EBA. Fairly common to uncommon, but easily overlooked; relatively quiet. Occurs in Canaíma National Park, in Venezuela.
Bibliography. Chapman (1931), Forrester (1993), Gilliard (1941), Hellmayr (1929), Hilty (2003), Mayr & Phelps (1967), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Rodner *et al.* (2000), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996).

40. **Green Manakin**

Chloropipo holochlora

French: Manakin vert **German**: Grünpipra **Spanish**: Saltarín Verde
Other common names: Lita Manakin (*suffusa*, *litae*)

Taxonomy. *Chloropipo holochlora* P. L. Sclater, 1888, "Bogotá" = east slope of Andes in Bogotá area, Colombia.
Genus closely related to *Xenopipo* and sometimes merged with it, but differs in having far less extensive vocal repertoire. Races W of Andes (*litae* and, possibly inseparable from it, *suffusa*) may represent a separate species, but further study is required. Four subspecies currently recognized.
Subspecies and Distribution.
C. h. suffusa Griscom, 1932 - E Panama (San Blas, Darién) and adjacent NW Colombia.
C. h. litae Hellmayr, 1906 - W of Andes in W Colombia and W Ecuador (S mainly to Pichincha).
C. h. holochlora P. L. Sclater, 1888 - E slope of Andes and adjacent lowlands from Colombia (S from Meta) S to C Peru.
C. h. viridior Chapman, 1924 - E slope of Andes in SE Peru.



Descriptive notes. 11·5-12·5 cm; 11-18·7 g. Nominate race is bright moss-green above, with an indistinct pale eyering, olive below, with pale yellow belly; iris dark brown; upper mandible blackish, lower mandible grey; legs greyish. Sexes similar. Juvenile apparently undescribed. Race *viridior* is on average larger than nominate, brighter above, with more extensive and deeper yellow below; *suffusa* and *litae* are markedly duller olive above, also on throat and breast, contrasting more with pale yellow belly. Voice. Generally silent; only a single harsh "arrrn", apparently in aggression, and soft sputtering calls recorded.
Habitat. Humid and wet forest in lowlands and foothills; mainly hilly *terra firme* forest in E Ecuador and Peru. To 1300 m, locally to 1500 m.
Food and Feeding. No detailed information. Occasionally seen at fruiting trees; perhaps more insectivorous than typical piprids. Sometimes found in mixed-species foraging flocks.
Breeding. Egg-laying recorded in Jun and nestling in mid-Aug in Panama; record of laying in Nov in Peru. Nest a shallow cup of rootlets, with moss and dead leaves hanging from bottom, 1·6-2 m over forest stream in fork of slender branch, attached by cobwebs, rootlets and moss. No other information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Little known. Apparently uncommon to locally fairly common, but easily overlooked; in some areas quite often captured in mist-nets. Was possibly more common and more widespread in W Ecuador prior to extensive deforestation; specimen captured in NC Los Ríos in 1950 and one mist-netted as far S as NW Azuay in 1991. Occurs in Río Nambí Natural Reserve, in Colombia.
Bibliography. Allen (1998), Angehr & Aucca (1997), Balchin & Toyne (1998), Best *et al.* (1997), Butler (1979), Chapman (1917c), Christian (2001), Cracraft (1985), Delgado (1985), Eisenmann (1955), Haffer (1975), Hellmayr (1929), Hilty & Brown (1986), Mee *et al.* (2002), Meyer de Schauensee (1982), Parker (1992c, 1997), Parker & Wust (1994), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Stotz *et al.* (1996), Wetmore (1972).

41. **Yellow-headed Manakin**

Chloropipo flavicapilla

French: Manakin à tête jaune **German**: Goldkappenpipra **Spanish**: Saltarín Amarillo

Taxonomy. *Pipra flavicapilla* P. L. Sclater, 1852, Nouvelle-Grenade [= Colombia; presumably from Bogotá area].
Genus closely related to *Xenopipo* and sometimes merged with it, but differs in having far less extensive vocal repertoire. Monotypic.
Distribution. Subtropical zone of Andes locally in Colombia (W range in Valle and Cauca, W slope of C range in Antioquia and Huila, possibly also E slope in W Putumayo) and N & C Ecuador (E slope in W Napo and Tungurahua).



Descriptive notes. 12-13 cm; 16·8-19·5 g. Male has golden-yellow crown and nape, bright olive upperparts; face, throat and breast paler and yellower, belly pale yellow; underwing-coverts white (may be visible at bend of wing); iris pale orange to red; upper mandible blackish, lower mandible paler bluish-grey; legs grey. Female is similar to male, but head and breast duller, less yellow. Juvenile resembles female but duller. Voice. Not recorded; apparently generally silent.
Habitat. Humid montane forest and mature secondary woodland; 1200-2400 m in Colombia, c. 1500-2100 m in Ecuador.
Food and Feeding. Little information; diet mainly fruits, probably including those of the rubiaceous genus *Palicourea*. Occasionally observed in mixed-species flocks.
Breeding. Female feeding dependent young in May and female with brood patch in Sept in Colombia. No other information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Colombian Inter-Andean Slopes EBA, Chocó EBA and Ecuador-Peru East Andes EBA. Poorly known and few recent records; apparently rare to uncommon, but probably easily overlooked. Only three records from Ecuador, one in 19th century (in Tungurahua) and two during Nov 1990 to Jan 1991 (both in W Napo). Certainly vulnerable to deforestation, which has been extensive in much of this species' range; a large percentage of its habitat has already been lost to agriculture. Further fieldwork and research required in order to establish its true conservation status, which may merit upgrading to the category of Vulnerable.
Bibliography. Best *et al.* (1997), Butler (1979), Chapman (1917c), Granizo *et al.* (1997), Hellmayr (1929), Hilty (1985), Hilty & Brown (1986), Iafrancesco *et al.* (1987), López *et al.* (2000), Mazar Barnett & Kirwan (2002b), Meyer de Schauensee (1982), Miller (1963), Negret (2001), Pacheco (2002b), Peña & Weber (2000), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg (2002), Stattersfield & Capper (2000), Stotz *et al.* (1996).

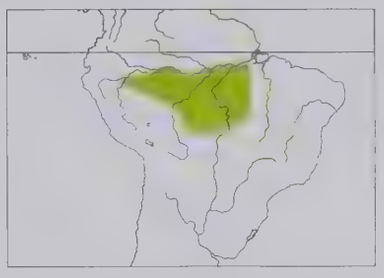
Genus *HETEROCERCUS* P. L. Sclater, 1862

42. **Flame-crested Manakin**

Heterocercus linteatus

French: Manakin à moustaches **German**: Schwarzkopfpipra **Spanish**: Saltarín Crestirrojo
Other common names: Flame-crowned Manakin; Anomalous Manakin ("*Pipra anomala*")

Taxonomy. *Elaenia linteata* Strickland, 1850, Borba, River Madeira, Brazil.
Genus has been suggested as being closest to *Pipra* on basis of syringeal details, also as possibly sister to *Corapipo* on basis of display behaviour and nest architecture. Forms a superspecies with *H. flavivertex* and *H. aurantiivertex*, and all three sometimes considered conspecific. Status of a fourth described taxon, *H. luteocephalus* ("Golden-crested Manakin"), known only from unique type (now lost or destroyed) from unknown locality, considered doubtful, probably of hybrid origin. Present species has apparently hybridized with *Pipra aureola* (hybrid form described as "*Pipra anomala*"). Monotypic.
Distribution. NE Peru (E Loreto), C Brazil S of Amazon (E to R Xingu drainage and SE Mato Grosso) and extreme NE Bolivia; also isolated population in SE Peru (close to Puerto Maldonado, in SE Madre de Dios).



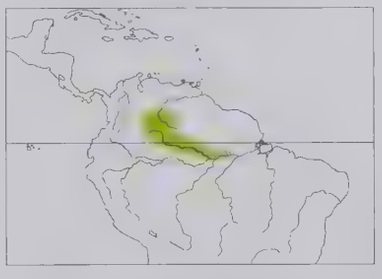
Descriptive notes. 14 cm; 20-24 g. Distinctive and unusual manakin with graduated tail (outer rectrices shortest), silky long throat feathers, relatively long and narrow bill. Male has black head, red coronal stripe (often concealed); otherwise, dark olive above and on flanks, white throat with elongated lateral feathers, sooty-olive band across chest, deep chestnut on breast, becoming cinnamon-rufous downwards; iris dark brown; bill and legs dark. Differs from congeners in darker colour above, red on crown. Female resembles male, but no red on crown, head concolorous with dark olive back, duskier on face, throat grey, flanks greyish-olive, rest of underparts cinnamon-buff, wings shorter. Juvenile apparently undescribed. Voice. Displaying male calls loudly, but call not described.
Habitat. Seasonally flooded forest (*várzea*) and riparian woodland; to c. 500 m.
Food and Feeding. Small fruits, insects and spiders taken. No other details.
Breeding. Not recorded. Male displays with others, flares white throat feathers, chases rivals. Nothing else known.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Generally uncommon; locally numerous, as in parts of Brazil (e.g. SE Mato Grosso). Very few records from Peru. Despite its wide range, this is a little-known species. Known to occur in Amazônia (Tapajós) National Park, in Brazil, and Noel Kempff Mercado National Park, in Bolivia.
Bibliography. Bates & Parker (1998), Dubs (1992), Forrester (1993), Gyldenstolpe (1950), Hellmayr (1929), Hennessey, Herzog & Sagot (2003), Meyer de Schauensee (1982), Parker, Schulenberg & Wust (1994), Pinto (1948), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1960, 1967, 1993, 1997), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Williams (1995a).

43. **Yellow-crested Manakin**

Heterocercus flavivertex

French: Manakin à bandeau jaune **German**: Grauwangenpipra **Spanish**: Saltarín Crestiamarillo
Other common names: Yellow-crowned Manakin

Taxonomy. *Heterocercus flavivertex* Pelzeln, 1868, Marabitanas, Rio Negro, Brazil.
Genus has been suggested as being closest to *Pipra* on basis of syringeal details, also as possibly sister to *Corapipo* on basis of display behaviour and nest architecture. Forms a superspecies with *H. linteatus* and *H. aurantiivertex*, and all three sometimes considered conspecific. Status of a fourth described taxon, *H. luteocephalus* ("Golden-crested Manakin"), known only from unique type (now lost or destroyed) from unknown locality, considered doubtful, probably of hybrid origin. Monotypic.
Distribution. E Colombia, SW Venezuela (extreme SE Apure, Amazonas), and Brazil N of Amazon (R Negro drainage E to W Pará).



Descriptive notes. 14 cm; 21 g. Distinctive and unusual manakin with graduated tail (outer rectrices shortest), silky long throat feathers, relatively long and narrow bill. Male has golden-yellow coronal patch (often concealed), rest of head and entire upperparts dark olive, face slaty-coloured; white throat with elongated lateral feathers, sooty-olive band across chest, deep chestnut on breast, becoming paler cinnamon-rufous below, flanks olive; iris dark brown; bill and legs dark; tongue and gape bright yellow (conspicuous when making advertising call). Differs from *H. linteatus* in having yellow on crown, head concolorous with somewhat paler upperparts. Female resembles male, but no yellow on crown, has grey throat, cinnamon-buff underparts, shorter wings; differs from female *H. linteatus* in slightly brighter upperparts, darker grey face. Immature male resembles female. Voice. Male advertising call a loud, whistled "weeee-pítch-ooo", lasting c. 3 seconds, with punctuated or hiccuping cadence; series of chattering "weer-weer-weer" in aggressive interactions; emphatic "chip" in display-flight from perch, and a "whoosh", probably of mechanical origin.
Habitat. Seasonally flooded forest (*várzea*) and adjacent scrubby woodland, seasonally flooded riparian woodland along black-water streams and oxbow lakes; to c. 300 m.
Food and Feeding. Small fruits and insects. Apparently more insectivorous than typical manakins, this possibly associated with longer, narrower bill. Insects taken from branches and leaves, usually in aerial sallies, rarely when perched. Sometimes briefly joins small mixed-species foraging flocks.
Breeding. Breeds in Feb-May (relatively dry season N of Amazon) in Venezuela. Male defends display territory, performs various flight displays, including rising above canopy, also flies rapidly through forest in presumed pursuit of rivals; courtship includes forward-bending while flaring throat feathers, raising and spreading tail, quivering body and tail. Only one nest documented, in Apr, a hanging cup in the fork of a descending tree branch, 2 m above surface of stream; apparently of typical piprid construction but it was abandoned before completion. No other information available.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common in suitable habitat; occurs in Junglaven Camp, in Venezuela. The only detailed study suggests rather low level of population compared with better-known piprid species.

Bibliography. Forrester (1993), Friedmann (1948), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Novaes (1978a), Oren & Parker (1997), Peres & Whittaker (1991), Prum *et al.* (1996), Ridgely & Tudor (1994), Sargeant (1994), Stotz *et al.* (1996), Willard *et al.* (1991), Zimmer & Hilty (1997).

44. **Orange-crested Manakin**

Heterocercus aurantiivertex

French: Manakin à bandeau orange **Spanish**: Saltarín Crestinaranja
German: Orangescheitelpipra
Other common names: Orange-crowned Manakin

Taxonomy. *Heterocercus aurantiivertex* P. L. Sclater and Salvin, 1880, Sarayacu, Ecuador.
Genus has been suggested as being closest to *Pipra* on basis of syringeal details, also as possibly sister to *Corapipo* on basis of display behaviour and nest architecture. Forms a superspecies with *H. linteatus* and *H. flavivertex*, and all three sometimes considered conspecific. Status of a fourth described taxon, *H. luteocephalus* ("Golden-crested Manakin"), known only from unique type (now lost or destroyed) from unknown locality, considered doubtful, probably of hybrid origin. Monotypic.
Distribution. Locally in E Ecuador (Napo) and N Peru (SW Loreto).
Descriptive notes. 14 cm; 21-22 g. Distinctive and unusual manakin with graduated tail (outer rectrices shortest), silky long throat feathers, relatively long and narrow bill. Male has greyish-olive head with orange coronal patch (often concealed), dull olive upperparts and sides, greyish-white throat, uniform dull cinnamon-buff underparts; iris dark brown; bill and legs dark. Differs from *H. flavivertex* in having orange (less yellow) on crown, somewhat duller upperparts, greyer throat feathers not (or only slightly) elongated, paler and more uniform underparts. Female is like male but duller, without orange on crown, shorter wings; differs from females of congeners in plainer-headed appearance, paler dull cinnamon-buff underparts. Immature resembles female. Voice. Male advertising call a thin, meandering trill of variable length, 1-3 seconds; loud chatter in aggressive interactions; in rapid vertical descent above forest canopy a hissing sound, increasing in volume as bird's speed increases (and almost certainly made by wings), followed by explosive "pop" (perhaps made by wings and/or tail) at end of descent.



Habitat. Seasonally flooded forest (*várzea*), mainly in black-water drainages; to 300 m.
Food and Feeding. Fruits and insects; small fruits of figs (*Ficus*) an important component of diet. Food items plucked or snatched in aerial sallies.
Breeding. Egg-laying recorded in Feb in N Peru. Male defends display "court" in forest; also has spectacular aerial display, flies steeply upwards in decreasingly narrow spirals to 60-100 m above canopy, then plummets down, gaining momentum with rapid wingbeats for 15-20 m, then continues descent on partially closed wings until 2-3 m above canopy, where abruptly changes direction, and finally flies in wide horizontal arc above canopy before entering trees at great speed and returning to its court. One active nest found (Peru), a shallow cup of vegetable fibres, so thinly woven that eggs visible from below, attached by spider web to supporting branch within fork of thin horizontal branch c. 4 m above small stream; contained 2 eggs; incubation and fledging periods not known.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Upper Amazon-Napo Lowlands EBA. Known from relatively few localities. Formerly considered rare, but recent study has shown it to be reasonably common in preferred habitat. In Ecuador, recently reported at various sites in region of R Napo and R Aguarico, including e.g. Sacha Lodge, Yuturi Lodge and La Selva; also observed more regularly in NE Peru. Range may be considerably wider than the few records indicate; possibly occurs in S Colombia (Putumayo).
Bibliography. Álvarez (2000, 2001), Best *et al.* (1997), Butler (1979), Cracraft (1985), Hellmayr (1929), Meyer de Schauensee (1982), Parker *et al.* (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rodner *et al.* (2000), Stotz *et al.* (1996).

PLATE 15 ➤


inches 3
cm 8
PLATE 15
45
46
47
48
49
50
51 ♂
♀
52
ssp chlorion
53
ssp tschudii
54 ♂
♀
ssp chloris
55 ♂
♀
ssp rosenbergi
ssp panamensis
ssp duidae
56
ssp major
with greyer head
57
ssp amazona
ssp turdina
58

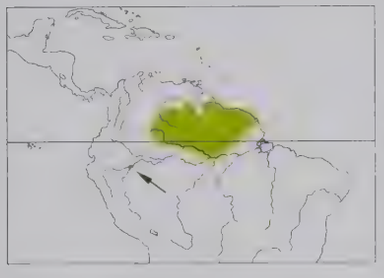
Genus *NEOPELMA* P. L. Sclater, 1861

45. Saffron-crested Tyrant-manakin

Neopelma chrysocephalum

French: Manakin à panache doré **German**: Goldscheitelpipra **Spanish**: Saltarín Coronigualdo
Other common names: Saffron-crested Manakin

Taxonomy. *Heteropelma chrysocephalum* Pelzeln, 1868, San Carlos, Río Negro, Venezuela.
Systematic position of genus doubtful; possibly closest to *Tyranneutes*, and both genera almost certainly only distantly related to the typical piprids; probably closer to the Tyrannidae but traditionally included in present family, where retained pending further study. Present species considered to form a superspecies with its four congeners. Monotypic.
Distribution. Extreme E Colombia (Vaupés), S Venezuela, the Guianas and N Brazil (mainly R Negro drainage and extreme N Amapá); also NE Peru (SW of Iquitos).



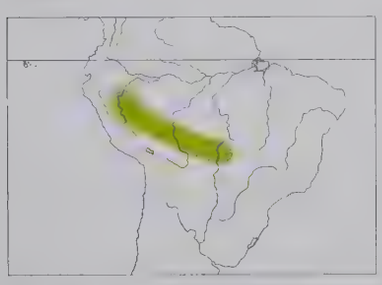
Descriptive notes. 13 cm; male 14·4-16·3 g. Dull, rather tyrannid-like manakin with relatively long bill and tail. Has rich golden-yellow median crownstripe (partly concealed) extending to nape, accentuated by dark greyish-olive crown side; upperparts olive-green, wings and tail tinged brownish; dull olive-grey throat, greyish-olive upper breast, contrastingly yellow lower breast and belly; iris pale orange to pale yellowish-white or whitish; bill and legs greyish. Sexes alike. Juvenile undescribed. Voice. Male advertising call a nasal, twanging "wrraaaaang, wrang-wrang-wrang", of variable length, also a repeated, nasal, squeaky "skeenh!".
Habitat. Woodland, including scrubby woodland, and forest in savanna areas, especially in places with thin-stemmed brushwood; found primarily in areas with sandy soils. To 700 m.
Food and Feeding. Small fruits and insects, latter including hymenopterans and small beetles (Coleoptera). Fruits taken by hover-gleaning; insects snatched in short, rapid sally to foliage, less often to branches or trunks.
Breeding. Male with greatly enlarged gonads in mid-May in Peru. Male displays solitarily, well away from but probably within hearing distance of one or more others; makes short upward leaps of 6-8 cm from thin horizontal perch, holding crown feathers raised and spread, while emitting twanging call; also adopts horizontal posture on perch while wing-flicking and neck-twitching, exhibiting golden crest. Nest and eggs not recorded.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally uncommon; locally numerous in areas of suitable habitat. Common in limited range in Peru, where only recently discovered. Rather infrequently observed, but thought to be probably more numerous than is suggested by recorded sightings. Occurs at Junglaven Lodge, in Venezuela.
Bibliography. Bangs & Penard (1918), Cohn-Haft *et al.* (1997), Davis (1949b), Forrester (1993), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Novaes (1978a), Ridgely & Tudor (1994), Sick (1967), Snow (1963c), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Willard *et al.* (1991).

46. Sulphur-bellied Tyrant-Manakin

Neopelma sulphureiventer

French: Manakin à ventre jaune **Spanish**: Saltarín Ventrisulfúreo
German: Westliche Gelbbauchpipra
Other common names: Sulphur-bellied Manakin

Taxonomy. *Scotothorus sulphureiventer* Hellmayr, 1903, Villa Bella de Mato Grosso, Mato Grosso, Brazil.
Systematic position of genus doubtful; possibly closest to *Tyranneutes*, and both genera almost certainly only distantly related to the typical piprids; probably closer to the Tyrannidae but traditionally included in present family, where retained pending further study. Present species considered to form a superspecies with its four congeners. Monotypic.
Distribution. E & SE Peru, N Bolivia (S to Cochabamba and N Santa Cruz) and adjacent parts of W Brazil.



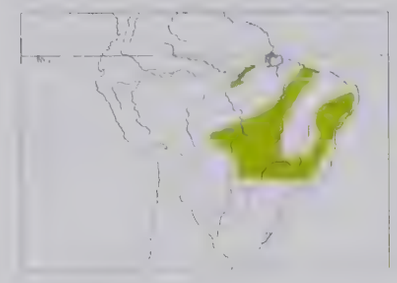
Descriptive notes. 13-13·5 cm; male 15-19·4 g, female 14-16 g. Dull, rather tyrannid-like manakin with relatively long bill and tail. Has pale sulphur-yellow median crownstripe (partly concealed), plain olive-green upperparts, slightly browner on wings and tail; dull greyish-white throat, greyish-olive upper breast, clear pale sulphur-yellow lower breast and belly; iris pale greyish to creamy or orange-brown; bill brownish; legs greyish. Sexes alike. Juvenile undescribed. Voice. Series of 3-4 doubled, hoarse, almost frog-like scolding notes, probably male advertising call.
Habitat. Humid forest, especially riverine forest with dense undergrowth, often where bamboo thickets present; to 450 m.
Food and Feeding. Limited data from stomach contents indicate mainly insectivorous diet; some fruits.
Breeding. No information. Jun, Aug and Oct specimens from Bolivia were not in breeding condition.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Poorly known species. Appears to be uncommon and local. An inconspicuous and shy inhabitant of dense undergrowth, hence is easily overlooked. Occurs in Manu National Park and Biosphere Reserve, in Peru.
Bibliography. Allen (1995), Angehr & Aucca (1997), Bates & Parker (1998), Craeraft (1985), Dubs (1992), Forrester (1993), Hellmayr (1929), Hennessey, Herzog & Sagot (2003), Mazar Barnett, Kirwan & Tobias (1998a), Meyer de Schauensee (1982), Parker & Hoke (2002), Remsen *et al.* (1988), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Sick (1993, 1997), Stotz *et al.* (1996), Terborgh *et al.* (1984).

47. Pale-bellied Tyrant-manakin

Neopelma pallescens

French: Manakin à ventre blanc **German**: Rahmbauchpipra **Spanish**: Saltarín Ventriblanco
Other common names: Pale-bellied Manakin

Taxonomy. *Tyrannula pallescens* Lafresnaye, 1853, Bahia, Brazil.
Systematic position of genus doubtful; possibly closest to *Tyranneutes*, and both genera almost certainly only distantly related to the typical piprids; probably closer to the Tyrannidae but traditionally included in present family, where retained pending further study. Present species considered to form a superspecies with its four congeners. Monotypic.
Distribution. E, C & S Brazil (on both sides of lower Amazon and lower R Tapajós, from Maranhão SW to S Mato Grosso, and from Rio Grande do Norte S to W São Paulo) and extreme NE Bolivia (Serranía de Huanchaca, in NE Santa Cruz).



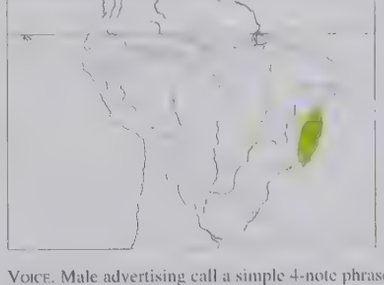
Descriptive notes. 14 cm; 16-20·5 g. Dull, rather tyrannid-like manakin with relatively long bill and tail. Has large bright yellow median crown patch, accentuated by dusky lateral borders; otherwise, plain olive above; whitish throat faintly streaked grey, breast pale olivaceous grey, belly pale creamy whitish; iris pale greyish-mauve; bill and legs brownish to greyish. Distinguished from congeners by larger size, whiter belly. Sexes alike. Juvenile undescribed. Voice. Male advertising call a soft, low, nasal "wraah, wra-wra".
Habitat. Deciduous woodland and gallery woodland, often in areas where heavy growth of vines present; to 700 m.
Food and Feeding. Diet apparently predominantly insects, as contents of four stomachs consisted entirely of insect remains; fruits of melastomes (of genus *Miconia*) also consumed.
Breeding. Carrying of nest material observed in early Nov in E Brazil (S Ceará). Male displays solitarily from low branch; from time to time makes small upward leap, often landing with reversed orientation. No other information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Not well known. Appears to be uncommon and local, but is inconspicuous and easily overlooked; true extent of range perhaps incompletely known. Occurs in Chapada Diamantina National Park, in Brazil (Bahia), and Noel Kempff Mercado National Park, in Bolivia.
Bibliography. Bates & Parker (1998), Bates *et al.* (1998), Dubs (1992), Forrester (1993), Hellmayr (1929), Hennessey, Herzog & Sagot (2003), Meyer de Schauensee (1982), do Nascimento *et al.* (2000), Pinto & Camargo (1961), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1960, 1967, 1993, 1997), de Souza (2000), Stotz *et al.* (1996), Willis & Oniki (1990).

48. Wied's Tyrant-manakin

Neopelma aurifrons

French: Manakin tyran **German**: Östliche Gelbbauchpipra **Spanish**: Saltarín de Wied
Other common names: Wied's Manakin

Taxonomy. *Muscicapa aurifrons* Wied, 1831, Camamú, south Bahia, Brazil.
Systematic position of genus doubtful; possibly closest to *Tyranneutes*, and both genera almost certainly only distantly related to the typical piprids; probably closer to the Tyrannidae but traditionally included in present family, where retained pending further study. "*N. inornata*" is a synonym of present species. Considered to form a superspecies with its four congeners; until recently was treated as conspecific with *N. chrysolophum*, but the two differ ecologically and vocally, and overlap geographically to a limited extent. Monotypic.
Distribution. Coastal E Brazil, from S Bahia S to E Minas Gerais, Espírito Santo and Rio de Janeiro.



Descriptive notes. 13 cm. Dull, rather tyrannid-like manakin with relatively long bill and tail. Has rather small yellow to orange-yellow median crownstripe (absent or vestigial in a minority of individuals, with some yellow only on feather bases of central crown); rest of head and entire upperparts plain olive-green; dull greyish-white throat, greyish-olive upper breast, pale sulphur-yellow lower breast and belly; iris pale greyish-mauve; bill and legs greyish. Distinguished from similar *N. chrysolophum* by much shorter tail, appreciably longer wing and bill, less conspicuous yellow crownstripe. Sexes alike. Juvenile undescribed. Voice. Male advertising call a simple 4-note phrase, repeated at regular intervals, shorter and simpler than that of *N. chrysolophum*.
Habitat. Undisturbed or lightly disturbed forest, generally in interior parts, but sometimes foraging near edges. Sea-level to c. 1000 m.

On following pages: 49. Serra Tyrant-manakin (*Neopelma chrysolophum*); 50. Dwarf Tyrant-manakin (*Tyranneutes stolzmanni*); 51. Tiny Tyrant-manakin (*Tyranneutes virescens*); 52. Grey-headed Piprites (*Piprites griseiceps*); 53. Wing-barred Piprites (*Piprites chloris*); 54. Black-capped Piprites (*Piprites pileata*); 55. Broad-billed Sapayoa (*Sapayoa aenigma*); 56. Varzea Mourner (*Schiffornis major*); 57. Thrush-like Mourner (*Schiffornis turdina*); 58. Greenish Mourner (*Schiffornis virescens*).

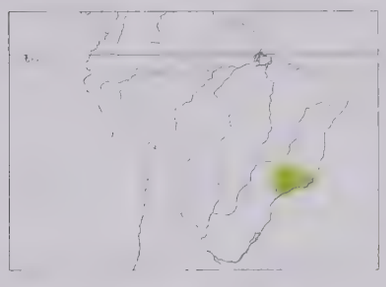
Food and Feeding. Primarily small fruits, also insects; one individual seen to take a stick-insect (Phasmida). Items plucked or snatched from foliage, mostly within c. 7 m of ground, in short-range flight sallies and hovers.
Breeding. Male sings from thin horizontal branch in shaded open area of understorey, generally 3·5-7 m above ground. Nest-site possibly beneath bank or under hanging roots. No other information.
Movements. Presumed resident.
Status and Conservation. ENDANGERED. Rare, and recorded from few sites; very few records since 1990. Last recorded in Bahia in 1990, in Chapada Diamantina National Park; no recent records from Minas Gerais. Recent observations from three localities in Espírito Santo, including Augusto Ruschi Biological Reserve; uncommon in Sooretama Biological Reserve in 1981, but seen there only once since. Known from a single locality in Rio de Janeiro. Formerly more widespread within its total E Brazilian range; population greatly reduced by extensive destruction of lowland Atlantic Forest. Conservation priorities include establishment of effective protection of the small population found NE of Rio de Janeiro city; field surveys also required in order to determine whether the species survives at other sites within its range.
Bibliography. Cracraft (1985), Forrester (1993), Hellmayr (1929), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Sargeant & Wall (1996), Sick (1960, 1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Whitney *et al.* (1995).

49. Serra Tyrant-manakin

Neopelma chrysolophum

French: Manakin de Serra do Mar **Spanish**: Saltarín de Serra do Mar
German: Goldhaubenpipra
Other common names: Serra do Mar Tyrant-manakin

Taxonomy. *Neopelma aurifrons chrysolophum* Pinto, 1944, no locality = Minas Gerais, Brazil.
Systematic position of genus doubtful; possibly closest to *Tyranneutes*, and both genera almost certainly only distantly related to the typical piprids; probably closer to the Tyrannidae but traditionally included in present family, where retained pending further study. Present species originally named as *Muscicapa luteocephala*, but that name invalid, as preoccupied. Considered to form a superspecies with its four congeners; previously treated as conspecific with *N. aurifrons*, but the two differ ecologically and vocally, and overlap geographically to a limited extent. Monotypic.
Distribution. Coastal SE Brazil, from EC Minas Gerais S to extreme S São Paulo and probably also adjacent E Paraná.



Descriptive notes. 13·5 cm; 13·5-14·9 g. Dull, rather tyrannid-like manakin with long tail. Has conspicuous yellow crown patch, rest of head and upperparts plain olive-green; dull greyish-white throat, greyish-olive upper breast, pale sulphur-yellow lower breast and belly; iris pale greyish-mauve; bill and legs greyish. Distinguished from similar *N. aurifrons* by noticeably longer tail, shorter bill and wing, often larger coronal patch. Sexes alike. Juvenile undescribed. Voice. Male advertising song of three elements, first 1-4 sharp notes, then 3-4 more drawn-out notes, and emphatic final note, e.g. "chip, chip, dree-zee-zee, zéw", longer and more complex than song of *N. aurifrons*.
Habitat. Dense secondary growth, forest edge, stunted woody vegetation, often with abundant bamboos and ferns; avoiding forest interior. At c. 1150-1750 m.
Food and Feeding. Small fruits and insects, taken from foliage in short-range aerial sallies and by hover-gleaning.
Breeding. Not recorded. Male sings from thin horizontal perch.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Central Brazilian Hills and Tablelands EBA and Atlantic Forest Mountains EBA. Occurs in small numbers in Itatiaia National Park, in Rio de Janeiro-Minas Gerais. Much suitable habitat persists in protected areas within its rather limited range.
Bibliography. Develey (2004), Meyer de Schauensee (1982), Sick (1993, 1997), Stotz *et al.* (1996), Whitney *et al.* (1995).

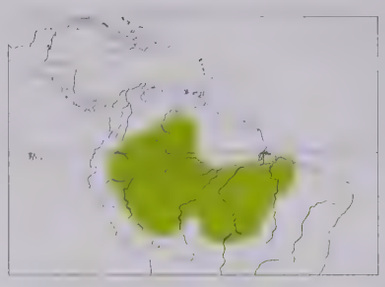
Genus *TYRANNEUTES* P. L. Sclater & Salvin, 1881

50. Dwarf Tyrant-manakin

Tyranneutes stolzmanni

French: Manakin nain **German**: Südliche Zwergpipra **Spanish**: Saltarín Enano

Taxonomy. *Pipra stolzmanni* Hellmayr, 1906, Marabitanas, Rio Negro, Brazil.
Systematic position of genus uncertain; probably closest to *Neopelma*, and both genera seem only distantly related to the typical piprids; probably closer to the Tyrannidae but traditionally included in present family, where retained pending further study. Forms a superspecies with *T. virescens*; ranges of the two approach one another closely, being separated by R Branco, lower R Negro and R Amazon. Monotypic.
Distribution. S Venezuela (Amazonas, W & S Bolívar) and Amazonia from E Colombia S (E from foothills of Andes) to Ecuador, Peru and N Bolivia, and E to NW & NC Brazil (E to R Negro and, S of Amazon, to Maranhão and S to S Mato Grosso).
Descriptive notes. 8-9 cm; 6·9-10 g. Tiny, drab manakin with very short tail, pale eyes. Plumage is uniformly olive above, throat to breast paler greyish-olive, belly pale yellow; iris yellowish-white or orange-tinged white to pale greyish or pale brown; bill dark, paler lower mandible; legs greyish. Differs from very similar *T. virescens* in lack of yellow crownstripe, pale eyes, marginally larger size with slightly longer tail. Sexes alike, female with marginally longer tail than male. Juvenile undescribed. Voice. Male advertising call an often repeated "jew-pit".



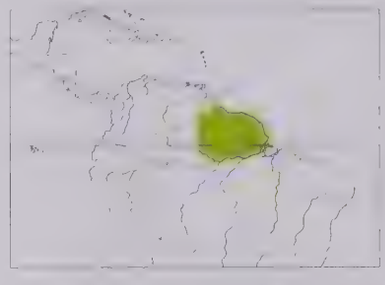
Habitat. Humid *terra firme* and, to lesser extent, *várzea* forest, especially on white sandy soils; rarely, forages out into edges and clearings. Mostly below 500 m; locally higher in W, to 1000 m in Ecuador.
Food and Feeding. Mainly small fruits; also invertebrates. Forages in lower and middle strata, but sometimes high into canopy.
Breeding. Single record: young in nest mid-Apr, E Ecuador. Nest a tiny cup (5 cm outside diameter, 3·5 cm inside, 3 cm deep) of sparse black rootlets, 1·5 m up in small sapling. Male display includes flying with very fast wingbeats from perch at top of very tall tree, straight up to height of 20-30 m, then "dive-bombing" back to same perch.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to common in much of range; often numerous in suitable habitat, but very easily overlooked. Notably inconspicuous, frequently detected only by its calls.
Bibliography. Allen (1995), Bates & Parker (1998), Best *et al.* (1997), Blake (1962), Butler (1979), Dubs (1992), Foster (1996, 1997), Friedmann (1948), Greeney *et al.* (2004), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Munn (1985), Oren & Parker (1997), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1960, 1967, 1993, 1997), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Terborgh *et al.* (1984), Walther (2004), Willard *et al.* (1991), Zimmer, J.T. (1930), Zimmer, K.J. & Hilty (1997), Zimmer, K.J. *et al.* (1997).

51. Tiny Tyrant-manakin

Tyranneutes virescens

French: Manakin minuscule **German**: Nördliche Zwergpipra **Spanish**: Saltarín Diminuto

Taxonomy. *Pipra virescens* Pelzeln, 1868, Manaus, Brazil.
Systematic position of genus uncertain; probably closest to *Neopelma*, and both genera seem only distantly related to the typical piprids; probably closer to the Tyrannidae but traditionally included in present family, where retained pending further study. Forms a superspecies with *T. stolzmanni*; ranges of the two approach one another closely, being separated by R Branco, lower R Negro and R Amazon. Monotypic.
Distribution. E Venezuela (NE & SE Bolívar), the Guianas and NE Amazonian Brazil (from R Branco and lower R Negro E to Amapá).
Descriptive notes. 7-8 cm; 6·8·5 g. Tiny, drab manakin with very short tail, dark eyes. Male has yellow crown patch (largely concealed); rest of head and upperparts dull olive, throat to breast paler greyish-olive, belly pale yellow; iris dark, brownish; bill dark, paler lower mandible; legs greyish. Differs from very similar *T. stolzmanni* in having yellow on crown, dark eyes, slightly smaller size with even shorter tail. Female is very like male, but has less yellow on crown, slightly longer tail. Juvenile undescribed. Voice. Male advertising call "whippy-jebree", repeated at intervals of 3-6 seconds.



Habitat. Humid forest, mainly *terra firme*, including on sandy soils; to c. 500 m.
Food and Feeding. Mainly small fruits, but also some insects, including lepidopteran larvae. Forages in lower and middle strata. Techniques include at least occasional sally-gleaning and hover-gleaning.
Breeding. Not recorded. Male display includes slow floating flights with rapid wingbeats between low perches, also sideways peering while perched; also spectacular towering flight above canopy followed by dive back to perch.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common or common, but very easily overlooked. Occurs in Imataca Forest Reserve and El Dorado, in Venezuela; reasonably common in Raleigh Falls-Voltzberg National Park and Brownsberg Nature Park, in Surinam.
Bibliography. Cohn-Haft *et al.* (1997), Cracraft (1985), Forrester (1993), Gilliard (1941), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (2003), Meyer de Schauensee (1982), Novaes (1978a), Ridgely & Tudor (1994), Sick (1993, 1997), Snow, D.W. (1961), Snyder (1966), Stotz *et al.* (1996), Thiollay (1992), Thiollay & Jullien (1998), Tostain *et al.* (1992), Walther (2004).

Genus *PIPRITES* Cabanis, 1847

52. Grey-headed Piprites

Piprites griseiceps

French: Piprite à tête grise **German**: Graustirnpiprites **Spanish**: Piprites Cabecigrís
Other common names: Grey-headed/Grey-hooded Manakin

Taxonomy. *Piprites griseiceps* Salvin, 1865, Tucurrique, Costa Rica.
Systematic position of genus uncertain; although traditionally included in present family, may be closer to Tyrannidae or Cotingidae. Forms a superspecies with *P. chloris*. Monotypic.
Distribution. Extreme E Guatemala and N Honduras S, mainly in Caribbean coastal areas, to extreme W Panama.
Descriptive notes. 12 cm; 16 g. Rather long-tailed for a manakin, and with tyrannid-like coloration and big-eyed, staring look. Has slate-grey head, conspicuous white eyering; olive-green upperparts, wing feathers with paler yellow-green margins; yellowish-olive below, paler and yellower on throat and belly; iris dark; bill blackish, paler lower mandible; legs grey. Sexes alike. Juvenile



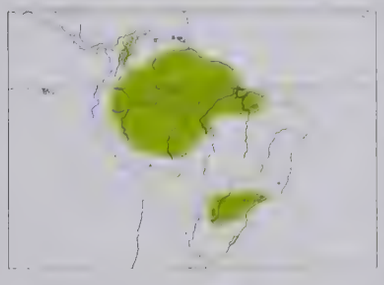
has olive-coloured head. Voice. Main calls a soft, liquid, rolling "purrr" and soft "chip" notes; song an elaborate, structured medley of staccato and rolling notes.
Habitat. Occupies forest and adjacent tall secondary growth; mostly at 100-600 m, locally up to 750 m.
Food and Feeding. Small fruits and insects, taken in flight sallies. Often joins mixed-species foraging flocks.
Breeding. Apparently unrecorded.
Movements. No information.
Status and Conservation. Not globally threatened. Restricted-range species: present in Central American Caribbean Slope EBA. Poorly known species. Uncommon to rare, and local; previously considered Near-threatened. Very few records in N & S parts of range; only one record from Guatemala. Occurs in Braulio Carrillo National Park and La Selva Biological Reserve, in Costa Rica.
Bibliography. Angehr (2003), Collar *et al.* (1994), Cooper (1997), Eisenmann (1955), Engleman (1996a), Hellmayr (1929), Howell & Webb (1995a), Kirwan & Hornbuckle (1997a), Land (1970), Lovey & Stiles (1994), Monroe (1968), Slud (1960, 1964), Stiles (1983, 1985), Stiles & Skutch (1989), Stotz *et al.* (1996).

53. **Wing-barred Piprites**

Piprites chloris

French: Piprite verdin **German**: Gelbzügelpiprites **Spanish**: Piprites Verde
Other common names: White-winged Piprites, Wing-barred Manakin

Taxonomy. *Pipra chloris* Temminck, 1822, Ipanema, São Paulo, Brazil.
Systematic position of genus uncertain; although traditionally included in present family, may be closer to Tyrannidae or Cotingidae. Forms a superspecies with *P. griseiceps*. Seven subspecies recognized.
Subspecies and Distribution.
P. c. perijana Phelps, Sr & Phelps, Jr, 1949 - subtropical zone of Sierra de Perijá on N Colombia-Venezuela border, and of E Andes in S Táchira (Venezuela).
P. c. antioquiae Chapman, 1924 - N Colombia at N end of C Andes and in middle Magdalena Valley.
P. c. chlorion (Cabanis, 1847) - N, E & S Venezuela (coastal mountains in Carabobo, Aragua and Sucre, also Amazonas and Bolívar), the Guianas, E Colombia and lower Amazonian Brazil (E Amazonas E to Amapá).
P. c. tschudii (Cabanis, 1874) - extreme E Colombia (SE Guainía), extreme S Venezuela (S Amazonas), W & C Amazonian Brazil, E Ecuador and C & E Peru (S to Junín).
P. c. boliviana Chapman, 1924 - SW Amazonian Brazil and N Bolivia.
P. c. grisescens Novaes, 1964 - E part of N Brazil (E Pará and Maranhão).
P. c. chloris (Temminck, 1822) - E Brazil (Espírito Santo, and from S Mato Grosso do Sul E to Rio de Janeiro, S to N Rio Grande do Sul), E Paraguay and NE Argentina (Misiones).



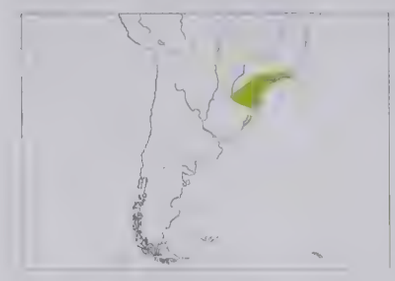
Descriptive notes. 12·5-14 cm; 15-21 g. Distinctive, with yellow eyering and wingbars reminiscent of some Nearctic vireos (*Vireo*), but large round head manakin-like. Nominate race has golden forehead and lores, olive-green crown, a little grey on nape; upperparts olive-green, upperwing-coverts and tertials with large, conspicuous creamy to white terminal spots, flight-feathers and tail edged paler dull green; underparts yellow, clouded with olive on breast; iris dark; bill greyish; legs light pinkish-grey. Sexes alike. Juvenile undescribed. Races vary mainly in coloration and brightness: *tschudii* is brighter olive above, nape and neck side grey; *perijana* resembles previous, but tail broadly tipped yellowish-white; *antioquiae* has upperparts brighter green, nape with less grey, brighter and clearer yellow underparts less suffused with olive; *chlorion* has yellow throat, is light greyish below, belly whiter, undertail-coverts yellowish; *boliviana* is like last but breast and ventral region yellower, grey band across centre of abdomen; *grisescens* is greyer overall. Voice. Song a rhythmic, far-carrying sequence, e.g. "whip, pip-pip, pidipip, whip", variable but always with hesitant cadence.
Habitat. Humid forest and mature secondary woodland, including *Araucaria* forest in S, and locally cloudforest in N. Favours areas with dense understorey or high vine tangles in trees. Mostly below 1000 m, locally to 1700 m; to 2000 m in N Venezuela.
Food and Feeding. Apparently mainly insects; small fruits occasionally taken. Insects gleaned from foliage, also hover-gleaned in short aerial sally. Regularly forages in forest canopy, accompanying mixed-species flocks.
Breeding. Male in breeding condition in May in Colombia (Antioquia); peak of singing in May-Jun in N Venezuela. Only one nest known to date, remarkable among manakins in being in a cavity, with no suspended nest structure. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common in much of range; often seems to be rather local, as for example in Ecuador and Colombia. Population of isolated nominate race in SE of range undoubtedly much reduced by extensive destruction of lowland forest; occurs, however, in several protected areas, including Augusto Ruschi Biological Reserve and Iguaçu National Park, in Brazil, Iguazú National Park, in Argentina, and Ybicuí National Park, in Paraguay.
Bibliography. Allen (1995), Bangs & Penard (1918), Bates & Parker (1998), Best *et al.* (1997), Blake (1962), Bond *et al.* (1989), Brooks *et al.* (1993), Butler (1979), Canevari *et al.* (1991), Capper *et al.* (2000), Chebez *et al.* (1999), Cohn-Haft *et al.* (1997), Dubs (1992), Fraga & Narosky (1985), Friedmann (1948), Gilliard (1941), Haffer (1967), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Lowen *et al.* (1996), Mazar Barnett & Pearman (2001), Meyer de Schauensee (1982), Munn (1985), Narosky & Yzurieta (1993), Navas & Bó (1988), Oren & Parker (1997), de la Peña (1989), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), do Rosário (1996), Sick (1993, 1997), Snyder (1966), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Terborgh *et al.* (1984), Tobias *et al.* (1993), Tostain *et al.* (1992), Willard *et al.* (1991), Zimmer & Hilty (1997), Zimmer *et al.* (1997).

54. **Black-capped Piprites**

Piprites pileata

French: Piprite chaperonné **German**: Zimtpiprites **Spanish**: Piprites Capirotado
Other common names: Black-capped Manakin

Taxonomy. *Pipra pileata* Temminck, 1822, Curitiba, Paraná, Brazil.
Systematic position of genus uncertain; although traditionally included in present family, may be closer to Tyrannidae or Cotingidae. Monotypic.
Distribution. SE Brazil (S Minas Gerais and Rio de Janeiro S to N Rio Grande do Sul) and extreme NE Argentina (Misiones).



Descriptive notes. 12·12·5 cm; 1 male 15 g. Highly distinctive, with conspicuous whitish on primaries. Male has black crown to nape, contrasting chestnut upperparts; remiges blackish, edged yellowish-green, prominent whitish at base of primaries; tail rufous, mostly black central feathers; lower forehead and face down to breast cinnamon-rufous, becoming paler and yellower on lower underparts; iris dark; bill yellow; legs orange-yellow. Female resembles male but much duller above, back dull olive, upperwing-coverts dusky with pale greyish tips (faint greyish wingbars). Juvenile undescribed. Voice. Calls include single "whééu", sometimes followed by a series of briefer, less loud notes; song a fast, rollicking sequence, e.g. "chik, chik, cheeút, chee-unh", variable but always with chortling quality.
Habitat. Montane Atlantic Forest, in S parts of range often associated with *Araucaria*; 900-2000 m.
Food and Feeding. Mainly small fruits, with those of the genera *Geonoma* (Arecaceae), *Rapanea* (Myrsinaceae) and *Leandra* (Melastomataceae) recorded as eaten; also small arthropods. Fruits plucked from branches; arthropods taken from foliage by gleaning or hover-gleaning. Forages mostly in canopy and subcanopy, but observed also in dense understorey of *Chusquea* bamboo thicket. Often accompanies mixed-species foraging flocks.
Breeding. Male specimen with greatly enlarged testes in late Sept, and display observed in Sept. No other information.
Movements. Apparently resident; some possible altitudinal movements suspected, e.g. in Itatiaia region of Brazil.
Status and Conservation. VULNERABLE. Restricted-range species: present in Atlantic Forest Mountains EBA. Rare and local, with very sparse distribution; seems never to have been numerous, and habitat loss has probably reduced its numbers even further. Almost all recent records are from Itatiaia National Park, on Rio de Janeiro-Minas Gerais border; on Itatiaia massif occurs in dense upper montane forest, which has suffered far less than adjoining areas of lowland forest, and in this and other protected montane areas in N of range, including Serra da Bocaína National Park and Campos do Jordão State Park, its survival prospects should be good. Very few records, recent or old, from S part of range, where *Araucaria* forest now extensively destroyed; may still occur in Aparados da Serra National Park, in Rio Grande do Sul. Outside Brazil, recorded once in extreme NE Argentina, in Sept 1959; alleged occurrence in Iguazú National Park not proven. Field surveys required in order to establish whether the species is still present at historical localities in e.g. Paraná, and to determine its exact habitat requirements; in addition, important to clarify extent, if any, of seasonal movement to lower elevations, as lower-altitude forest in the region is at greater risk of destruction.
Bibliography. dos Anjos & Schuchman (1997), Canevari *et al.* (1991), Chebez (1994), Chebez *et al.* (1999), Collar & Andrew (1988), Collar *et al.* (1992), Cracraft (1985), Forrester (1993), Hellmayr (1929), Mazar Barnett & Pearman (2001), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), de la Peña (1989), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stotz *et al.* (1996), Tobias *et al.* (1993).

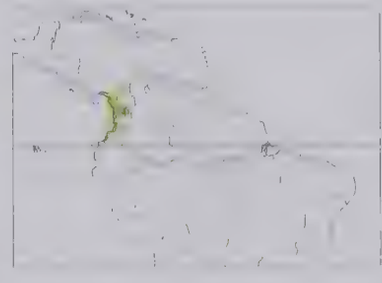
Genus *SAPAYOA*, Hartert, 1903

55. **Broad-billed Sapayoa**

Sapayoa aenigma

French: Sapayoa à bec large **German**: Breitschnabelpipra **Spanish**: Sapayoa
Other common names: Sapayoa, Broad-billed Manakin

Taxonomy. *Sapayoa aenigma* Hartert, 1903, River Sapayo [= Zapallo Grande], Esmeraldas, Ecuador.
Systematic position and affinities enigmatic. Seems to be close to the Tyrannidae, and has sometimes been placed in its own separate family, Sapayoaidae. Traditionally included in present family, although nest (only recently discovered) and social organization unlike those of typical piprids; this treatment retained, pending further study. Monotypic.
Distribution. Panama (E from Canal Zone) and W Colombia (Pacific coast and E to middle Magdalena Valley) S to extreme NW Ecuador (Esmeraldas, NW Pichincha).



Descriptive notes. 13·5-15 cm; 20·8 g. Dull, tyrannid-like species with broad, flat bill, rictal bristles; tail long for a manakin. Male has yellow crownstripe (usually concealed); rest of plumage mostly plain olive, wings and tail duskier, throat and belly tinged yellower; iris dull reddish-brown; bill black; legs grey. Female lacks yellow crownstripe. Juvenile undescribed, presumably resembles female. Voice. Inadequately known; two calls described as a soft, somewhat nasal trill, and slightly louder "chip, ch-ch-ch".
Habitat. Humid forest, in lower and middle strata, often near streams and ravines; to 1100 m.

Food and Feeding. Small fruits and insects. Perches, often for considerable periods, peering around, before making aerial sallies; takes insects from air as well as from foliage, unlike typical manakins. Regularly accompanies mixed-species foraging flocks.
Breeding. Egg-laying in late Apr or early May, and a nest with chicks in May, in Panama; birds in breeding condition in Feb-Apr in W Colombia. One nest found, pear-shaped, tapered at top and rounded at bottom, composed of long strips of fibrous outer bark, with 30 cm of loose fibrous strands hanging below, entrance at side near bottom, covered by hood of fibres, suspended from lower branch of *Perebea* tree 2 m above forest stream; contained 2 nestlings, fed by both parents.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Status not well known, largely because species is generally quiet and unobtrusive. Apparently rare to uncommon, and possibly rather local in distribution.
Bibliography. Best *et al.* (1997), Butler (1979), Chapman (1917c), Christian (2001), Cracraft (1985), Delgado (1985), Eisenmann (1955), Fjeldså *et al.* (2003), Haffer (1975), Hellmayr (1929), Hilty & Brown (1986), Lanyon, W.E. (1985), Mena & Jahn (2002), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), Stotz *et al.* (1996), Wetmore (1972).

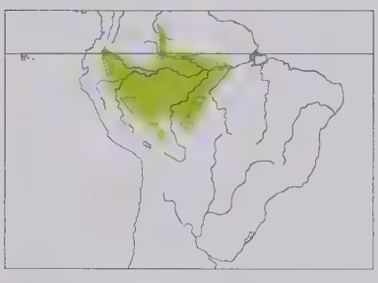
Genus *SCHIFFORNIS* Bonaparte, 1854

56. Varzea Mourner

Schiffornis major

French: Antriade roussâtre **German**: Zimttrauerkotinga **Spanish**: Llorón de Varzea
Other common names: Greater Manakin, Greater/Rufous Schiffornis

Taxonomy. *Schiffornis major* Des Murs, 1856, Sarayacu, Peru.
Systematic position of genus uncertain. Analysis of 19 characters, mostly anatomical, suggested that it is a member of a monophyletic assemblage of six superficially very diverse genera currently divided among Cotingidae, Tyrannidae and the present family; also, recent analyses of genetic data resulted in its grouping with the genera *Pachyramphus* and *Tityra* (both at present provisionally placed in Tyrannidae) in a "tityrine clade"; traditional placement in present family almost certainly inappropriate, but retained pending further study. Two subspecies recognized.
Subspecies and Distribution.
S. m. duidae J. T. Zimmer, 1936 - S Venezuela (W Amazonas).
S. m. major Des Murs, 1856 - S Colombia, E Ecuador and W & C Amazonian Brazil (E to mouth of R Tapajós) S to E Peru and N Bolivia.



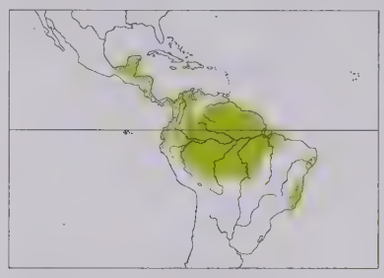
Descriptive notes. 15-15·5 cm; 31 g. Nominate race has grey area around eye, extent variable, sometimes reaching crown, occasionally lacking; head otherwise rufous, lores paler, back rufous, rump and tail bright cinnamon-rufous, wings dusky with broad rufous edgings; throat greyish-buff, underparts cinnamon-rufous, becoming paler cinnamon-buff on belly and vent; iris dark brownish; bill and legs dark grey to blackish. Sexes alike. Juvenile undescribed, apparently resembles adult. Race *duidae* differs from nominate in having head almost entirely grey, back duller brown. Voice. Song a leisurely series of loud slurred whistled notes, with pauses of 2-3 seconds towards end; "chrrrrrrt" rattle in excitement.
Habitat. Seasonally flooded forest (*várzea*), to 300 m.
Food and Feeding. Not well known; apparently similar to that of *S. turdina*.
Breeding. No information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common, but local throughout range. Poorly known species, heard much more often than seen.
Bibliography. Allen (1995), Bates & Parker (1998), Butler (1979), Friedmann (1948), Hellmayr (1929), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson (1997), Robinson & Terborgh (1997), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Terborgh *et al.* (1984), Traylor (1958), Willard *et al.* (1991), Zimmer & Hilty (1997).

57. Thrush-like Mourner

Schiffornis turdina

French: Antriade turdoïde **German**: Brauntrauerkotinga **Spanish**: Llorón Turdino
Other common names: Thrush-like Manakin/Schiffornis; Brown Mourner/Manakin/Schiffornis (*veraepacis*)

Taxonomy. *Muscicapa turdina* Wied, 1831, Bahia, Brazil.
Systematic position of genus uncertain. Analysis of 19 characters, mostly anatomical, suggested that it is a member of a monophyletic assemblage of six superficially very diverse genera currently divided among Cotingidae, Tyrannidae and the present family; also, recent analyses of genetic data resulted in its grouping with the genera *Pachyramphus* and *Tityra* (both at present provisionally placed in Tyrannidae) in a "tityrine clade"; traditional placement in present family almost certainly inappropriate, but retained pending further study. Present species forms a superspecies with *S. virescens*. Geographical variation involves both plumage and voice; pale and dark forms, as well as upland and lowland ones, occur, and situation especially complex in NW South America and adjacent Panama; possible taxonomic significance of vocal differences not understood; races probably constitute more than one species, but critical studies not yet undertaken. Thirteen subspecies recognized.
Subspecies and Distribution.
S. t. veraepacis (P. L. Sclater & Salvin, 1860) - Caribbean slope from SE Mexico S to Nicaragua, and both slopes in Costa Rica.
S. t. dumicola (Bangs, 1903) - W & C Panama.
S. t. panamensis Hellmayr, 1929 - lowlands of C & E Panama and NW Colombia (N Chocó, W Córdoba).
S. t. acrolophites Wetmore, 1972 - extreme E Panama (Cerro Tacarcuna) and adjacent highland areas of NW Colombia.
S. t. rosenbergi (Hartert, 1898) - Pacific slope from W Colombia S to extreme NW Peru (Tumbes).
S. t. stenorhyncha (P. L. Sclater & Salvin, 1869) - N & NE Colombia and N Venezuela (Zulia E to Aragua).
S. t. olivacea (Ridgway, 1906) - SE Venezuela and Guyana.
S. t. aenea J. T. Zimmer, 1936 - E slope of E Andes in Ecuador and adjacent N Peru.
S. t. amazona (P. L. Sclater, 1861) - lowlands from extreme E Colombia and S Venezuela S to E Ecuador, E Peru and NW & W Brazil (E to R Negro and NW Mato Grosso).
S. t. wallacii (P. L. Sclater & Salvin, 1867) - Surinam, French Guiana and E Amazonian Brazil (lower R Negro E to Amapá and, S of Amazon, from R Tapajós and lower R Teles Pires E to Maranhão).
S. t. steinbachi Todd, 1928 - SE Peru and N Bolivia.
S. t. intermedia Pinto, 1954 - E Brazil (Paraíba, Pernambuco, Alagoas).
S. t. turdina (Wied, 1831) - SE Brazil (S Bahia S to Espírito Santo).



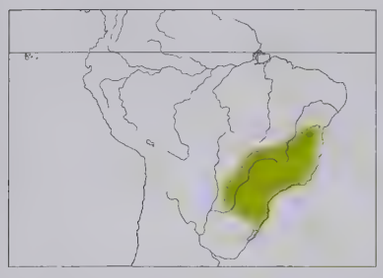
Descriptive notes. 15·5-16·5 cm; average 35 g in Costa Rica (*veraepacis*), 31 g in French Guiana and N Brazil (Belém) and 28-34 g in Surinam (*wallacii*), and 27·2-31·5 g in C Brazil (Mato Grosso, *amazona*). Rather uniform and dull-coloured, with prominent dark eye set off by indistinct pale eyering. Nominate race is dull brownish-olive above, wings edged rufescent, slightly paler olive-grey below, breast browner; iris brown to dark brown; bill blackish; legs olive-greyish. Sexes alike. Juvenile resembles adult. Races vary mainly in plumage tone, to lesser extent also in size, largest in NW & SE extremes of range: *veraepacis* is dark brownish-olive, wings warmer brown, belly duller and greyer, largest; *panamensis* is lighter, with brighter brown crown, wings and tail, cinnamon-rufous throat contrasting with greyish-olive breast and belly; *dumicola* is darker and more olive-brown than previous, more uniform both above and below; *acrolophites* is very like last, but darker and more olive overall, with chin and throat chestnut-brown; *rosenbergi* is dark brownish-olive below, with no hint of grey; *olivacea* is very dull and uniform-looking, olive-brown; *aenea* differs from previous two in having crown more rufescent, upperparts browner (less greenish), wings warmer brown, breast more brownish, belly somewhat brighter and more greenish-tinged; *amazona* has rufescent-tinged crown like last but is paler overall, less brown and more olive above, with moderately developed tawny colour on throat, more greyish below, dull belly; *wallacii* resembles previous but is paler throughout, pale belly; *stenorhyncha* is darker and more rufous-brown above than last, especially on wings, with yellowish-tinged brown throat and chest, somewhat contrasting greyish-olive lower underparts; *steinbachi* and *intermedia* are similar to nominate but smaller. Voice. Song, usually given at long intervals, a sequence of normally 2-4 clear, rich musical whistles, last one sharply upslurred, very variable geographically, e.g. in Mexico (*veraepacis*) "djeeeeu whee-chee" or sometimes 2-note "dweeeer weet", in Panama (*panamensis*) "teeuu, wheet-wheet, wheet", in Surinam (*wallacii*) "teeeeu, wheeeu-wheé-tu", on W slope in Ecuador (*rosenbergi*) very slow "teeeeu, weee-ti" but on E slope (*aenea*) much faster "teeeu wheeu-wheé-tu-tu" and in E lowlands (*amazona*) again a slower "teeeeu, weee, tu-weeeé", and in SE Brazil (nominate) somewhat sluggish "teeuu, yoowée, tu, tu-wee". Short rattling chatter also given.
Habitat. Humid forest, very infrequently adjacent tall second growth; almost always in interior, rarely near edge. Lowlands to c. 1500 m; locally to 1700 m in Costa Rica and Ecuador, occasionally to 1800 m in Venezuela N of R Orinoco. In SE Brazil (nominate race), occurs at lower altitudes than *S. virescens* where ranges overlap.
Food and Feeding. Fruits and insects. Takes larger fruits than do typical manakins; in French Guiana, capsules of Myristicaceae, Burseraceae and Meliaceae and berries of Annonaceae, Lauraceae and Moraceae eaten. More insectivorous than typical manakins. Forages solitarily, rarely joins mixed-species flocks. Works through forest undergrowth, often clings 1-2 m up on side of vertical stems while peering around; snatches insects from vegetation in short aerial sallies.
Breeding. Egg-laying in Feb-Aug (chiefly May) in Costa Rica, and in Feb (single record) in N Brazil; young being fed in Dec in French Guiana; birds in breeding condition in Jan-Jun in N Colombia. Nest a bulky cup mainly of large dead leaves or leaf skeletons, lined with rootlets or black fungal rhizomorphs, 0·6-1·8 m above ground in spiny palm, hollowed top of palm stump, vine tangle, or on small epiphyte, supported from below. Clutch 2 eggs; incubation period 20-21 days; fledging period not documented.
Movements. Almost certainly sedentary.
Status and Conservation. Not globally threatened. Generally uncommon to fairly common, but unobtrusive; heard far more often than seen. Fairly common to common in Mexico; locally fairly common in many parts of its extensive range, as e.g. in Costa Rica and Panama, and in Venezuela, Colombia and Ecuador; in general less numerous in lowland areas, e.g. uncommon to rare in lowlands of Costa Rica. Possibly extinct in deforested parts of Pacific slope of Panama, and E Brazilian populations (*intermedia*, nominate) in Atlantic coastal areas undoubtedly much reduced by deforestation. In radio-tracking studies in French Guiana, home ranges in breeding season of two males were 14·3 ha and 16·5 ha, respectively, and of one female 20·1 ha, all larger than those of typical manakins.
Bibliography. Binford (1989), Cohn-Haft *et al.* (1997), Cracraft (1985), Eisenmann (1955), Forrester (1993), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1929), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995a), Monroe (1968), Oren & Parker (1997), Perry *et al.* (1997), Pinto (1948), Pople *et al.* (1997), Prum & Lanyon (1989), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), Schubart *et al.* (1965), Sick (1993, 1997), Skutch (1969, 1981), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Théry (1990c, 1992), Tostain *et al.* (1992), Wetmore (1972), Wiedenfeld *et al.* (1985), Zimmer, J.T. (1930), Zimmer, K.J. & Hilty (1997), Zimmer, K.J. *et al.* (1997).

58. Greenish Mourner

Schiffornis virescens

French: Antriade verdâtre **German**: Olivtrauerkotinga **Spanish**: Llorón Verdoso
Other common names: Greenish Manakin/Schiffornis

Taxonomy. *Ptil[ochloris] virescens* Lafresnaye, 1838, Rio de Janeiro, Brazil.



Systematic position of genus uncertain. Analysis of 19 characters, mostly anatomical, suggested that it is a member of a monophyletic assemblage of six superficially very diverse genera currently divided among Cotingidae, Tyrannidae and the present family; also, recent analyses of genetic data resulted in its grouping with the genera *Pachyramphus* and *Tityra* (both at present provisionally placed in Tyrannidae) in a "tityrine clade"; traditional placement in present family almost certainly inappropriate, but retained pending further study. Present species forms a superspecies with *S. turdina*. Monotypic.

Distribution. SE Brazil (from S Goiás E to S Bahia, S to E Mato Grosso do Sul and N Rio Grande do Sul), E Paraguay and NE Argentina (Misiones, NE Corrientes).

Descriptive notes. 15·5 cm; male 21·5-24 g, female 26·7-28·5 g. Dull-looking, with indistinct pale eyering. Plumage is dull greenish-brown, wings and tail contrastingly rufescent; paler below; iris dark brown; bill and legs olive-greyish. Distinguished from similar *S. turdina* by greener general coloration, contrastingly rufescent wings and tail, slightly smaller bill. Sexes alike. Juvenile not described. Voice. Song, usually given at long intervals, a sequence of 2-4 clear musical whistles, with emphasis on final notes.

Habitat. Humid forest, gallery forest and mature secondary woodland; to c. 1200 m. Occurs at higher elevations than *S. turdina* where ranges overlap.

Food and Feeding. Little information; adult insects and caterpillars recorded as eaten. Apparently similar to *S. turdina*.

Breeding. Single record: nest found in Brasília, 19th Dec, a large cup of leaves placed 3 m above ground in upright fork of bush, contained 2 eggs. No other information.

Movements. None recorded.

Status and Conservation. Not globally threatened. Rather common in some adequately protected areas of very humid, low montane forest. Not well known; heard much more frequently than it is seen.

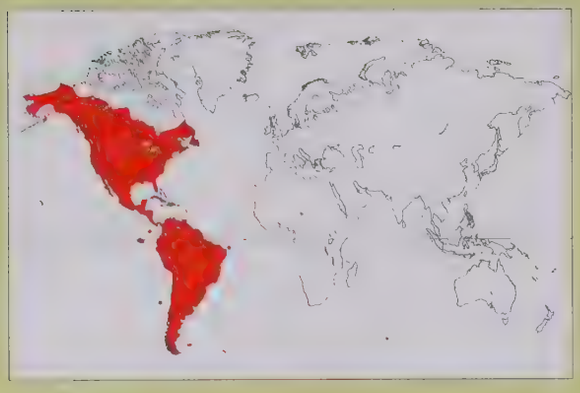
Bibliography. Brooks *et al.* (1993), Canevari *et al.* (1991), Capper *et al.* (2000), Dubs (1992), Forrester (1993), Fraga & Narosky (1985), Gonzaga *et al.* (1995), Hellmayr (1929), Lowen *et al.* (1995), Mazar Barnett & Pearman (2001), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Navas & Bó (1988), de la Peña (1989), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stotz *et al.* (1996), Tobias *et al.* (1993), Venturini *et al.* (2001).

Class AVES

Order PASSERIFORMES

Suborder TYRANNI

Family TYRANNIDAE (TYRANT-FLYCATCHERS)



- Tiny to medium-sized passerines, with plumage mostly various combinations of black, brown, white, yellow and green, some duller, a few much brighter; very diverse in body proportions, bill shape and structure, and leg length.
- 6·5 -28 cm.



- America.
- Wide variety of habitats, mostly forest and woodland of various types, also grassland.
- 104 genera, 429 species, 1081 taxa.
- 24 species threatened; none extinct since 1600.

Systematics

The tyrant-flycatchers, also referred to sometimes as the New World flycatchers, constitute by far the largest family of birds in the Western Hemisphere, and also one of the most diverse. With its species-richness peaking in the Neotropics, Tyrannidae encompasses ecological and morphological equivalents of a huge array of bird groups found elsewhere in the world. The tyrannid radiation includes lineages that exhibit evolutionary convergence with typical Old World flycatchers (Muscicapidae) and monarch-flycatchers (Monarchidae), the New World warblers (Parulidae) and Old World warblers (Sylviidae), the true shrikes (Laniidae), the babblers (Timaliidae), the jays (Garrulinae), the wrens (Troglodytidae), the gnatcatchers (Polioptilidae), the pipits (Motacillidae), the thrushes (Turdidae), the flowerpeckers (Dicaeidae), and a coraciiform family, the todies (Todidae). Tyrant-flycatchers include elegant species that execute aerial sallies from perches high atop the tallest tropical trees; massive, hook-billed predators that pounce on lizards in the montane scrub; long-legged terrestrial runners of the arid South American coast and the barren Andean Altiplano; delicate, nervously active insectivores that move through tropical forest canopies with mixed-species flocks; and minute, spatulate-billed sprites that leap upwards to snatch insects from the undersides of leaves in dense scrub and streamside thickets. They vary in body size from the world's smallest passerine bird to robust, shrike-sized predators.

Currently, Tyrannidae comprises a total of 429 species, placed in 104 genera. The bulk of the family's members almost certainly form a monophyletic group, united by several internal anatomical features and by shared DNA characters. An additional assemblage of 23 species consists of the mourners (*Laniocera*), the tityras (*Tityra*), the becards (*Pachyramphus*) and the monotypic genus *Xenopsaris*, all of which are taxonomically problematic genera that have for more than a hundred years been shifted back and forth between the cotingas (Cotingidae) and the Tyrannidae. They display genetic, anatomical and behavioural characters that could unite them with either family, and other characters that seem to place them as sister-taxa to both. Even now, although many authors treat them as members of the Tyrannidae, others place some or all of the four genera within the Cotingidae. The problematic taxonomic status of these groups presumably reflects an early divergence from the primitive, proto-tyrannid ancestor.

Considerable anatomical and molecular evidence indicates that Tyrannidae falls within a natural, monophyletic group of suboscine families that also includes the manakins (Pipridae) and the cotingas. This group is commonly regarded as constituting the superfamily Tyrannoidea, or alternatively, as in the present work, the suborder Tyranni. Although still imperfect, evidence is mounting that Tyrannidae itself is monophyletic. All tyrant-flycatchers, including the genera *Tityra*, *Pachyramphus* and *Xenopsaris*, possess a pair of small, variously shaped cartilaginous plates located within the internal tympaniform membranes inside the syrinx. The function of this internal cartilage is entirely unknown, but this peculiar trait is almost restricted to the Tyrannidae and thus comes as close to being a definitive character for the family as does any other. Within the suborder Tyranni, a few other genera presently



For years, eminent taxonomists were mystified by an odd Zimmerius *tyrannulet lying in a drawer at Chicago's Field Museum. The puzzle of its identity was finally solved when identical birds were discovered in white-sand forests near Iquitos, Peru. The* ***Mishana Tyrannulet*** *had escaped detection until 2001 because it was confined to a specialized habitat in a small range. Moreover, tyrannulets are not the most prepossessing of birds, and are easily overlooked. A large proportion of all new species described over the last two decades have been tyrannids; several others await formal description, and more are sure to follow.*

[*Zimmerius villarejoi*, Alto Nanay, Loreto, Peru. Photo: José Álvarez Alonso]



Subdivision of the Tyrannidae.

[Figure: Norman Arlott, Hilary Burn, Ian Lewington and Ian Willis]

treated as non-tyrannids do also have internal syringeal cartilages. These are *Oxyruncus* and *Iodopleura*, placed in the Cotingidae, and the five genera *Schiffornis*, *Piprites*, *Sapayoa*, *Tyranneutes* and *Neopelma*, currently treated as belonging to Pipridae. In many other respects as well, these seven genera present some confusion with regard to their taxonomic affinities, and it seems likely that they represent primitive offshoots from the early tyrannoid ancestor. R. O. Prum and W. E. Lanyon, the two specialists in tyrannoid syringeal morphology, have suggested that the presence of internal cartilage is not universally homologous but was, instead, independently derived in several groups, presumably early in the evolutionary radiation of the Tyranni. Of these groups, only the Tyrannidae then underwent the spectacularly successful radiation that gave rise to the huge family that we see today.

Another syringeal character, the presence of an intrinsic M. obliquus ventralis muscle, also comes very close to being a definitive feature of the Tyrannidae. It appears, however, to be missing in several genera otherwise considered to belong in the family: *Terenotriccus*, *Myiobius*, *Pyrrhomyias*, *Onychorhynchus*, *Tolmomyias*, *Todirostrum* and *Zimmerius*. This muscle is absent also in the taxonomically controversial *Tityra* and *Pachyramphus*.

Robust evidence from DNA studies affirms the unity of the Tyranni as a natural group, but these studies, too, remain equivocal about the strict monophyly of the Tyrannidae within this group. DNA-DNA hybridization evidence was interpreted as revealing such a deep split within the "true" tyrant-flycatchers that it was deemed necessary to erect a new subfamily, Pipromorphinae, later changed to Mionectinae, in order to recognize a previously unsuspected assemblage that included the genera *Mionectes* and *Todirostrum* and relatives. Moreover, the DNA-hybridization distance between these two otherwise "typical" tyrant-flycatcher groups was greater than that separating the bulk of the tyrannids from the manakins and cotingids. Consequently, C. G. Sibley and J. E. Ahlquist, in their major taxonomic compendium, treated the latter two groups as subfamilies Piprinae and Cotinginae, respectively, within a greatly enlarged family Tyrannidae. A number of



A supposed Rufous-crowned Tody-tyrant (Poecilotriccus ruficeps) *collected south of the River Marañón in 1970 differed from its sister-species to the north in lacking black markings on the face and neck. Despite this discovery it took several decades before sufficient material was gathered for the species to be formally named in 2001.* ***Johnson's Tody-tyrant*** *was found to differ from its northern counterpart, not only in terms of morphology, but in the pattern of its song. It is restricted to the Cordillera de Colán and neighbouring ranges, and joins a relatively long list of tyrannids newly described to science in the last few years.*

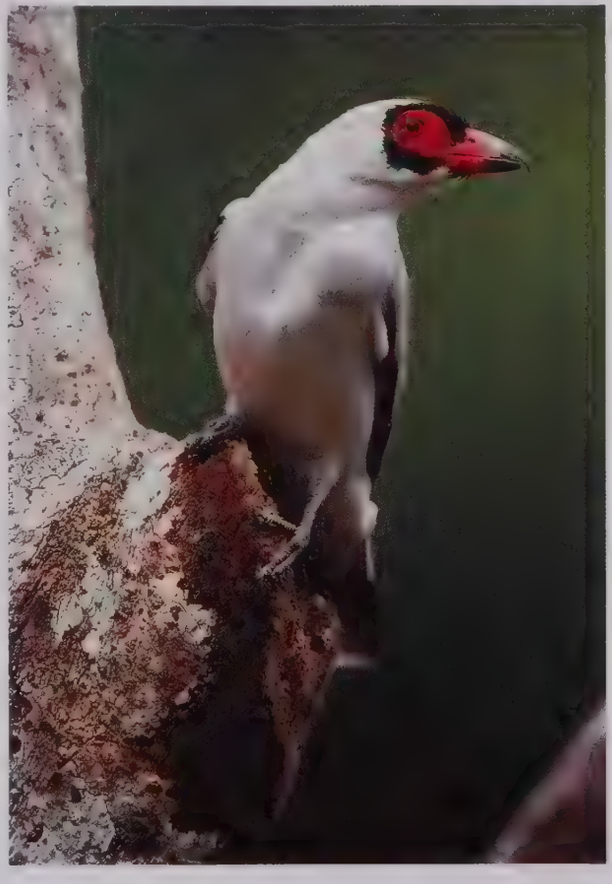
[*Poecilotriccus luluae*, Abra Patricia, San Martín, Peru. Photo: Jon Hornbuckle]

more recent studies, based on DNA-sequence data, refute this hypothesis, however, and these, together with a considerable body of anatomical, morphological and behavioural evidence, strongly support true monophyly of the Tyrannidae. Nevertheless, it should be noted that DNA-sequence data do suggest that *Tityra* and *Pachyramphus* represent a sister-group to the true tyrant-flycatchers, and that this group perhaps also contains the enigmatic genus *Schiffornis*.

Generic limits, and even many suprageneric assemblages, of tyrant-flycatchers are reasonably clear and well defined by modern phylogenetic analyses. In contrast, major taxonomic divisions at the level of the subfamily remain rather informally designated, and present fuzzy boundaries, as the subfamilial affinities of a number of genera are in doubt. Thus, despite over a century of published research and debate, and a host of recent studies that have clarified many of the major groupings in the family, it is not yet possible to provide entirely exception-free technical diagnoses that subdivide the Tyrannidae definitively into subfamilies. The most recent comprehensive revision of the Tyrannidae, completed by M. A. Traylor in 1977 and published two years later in his compilation for Volume 8 of J. L. Peters's *Checklist of the Birds of the World*, recognized three typical subfamilies, with a fourth more loosely attached. This arrangement has been generally followed by most subsequent authors, although a number of genera have been moved within their respective subfamilies, or shifted from one subfamily to another, on the basis of more recently published, large-scale comparative analyses and a steady production of studies clarifying the affinities of individual genera.

It is worth noting here that, when dealing with such a large and complex family as Tyrannidae, the assessment of relationships among genera and species is facilitated by investigation of a number of very different factors. While anatomical, morphological and genetic characteristics are obviously of great importance, such additional aspects as voice and behaviour are often considered significant in indicating possible affinities. Details of nest architecture and placement, and foraging behaviour and diet, as well as details of vocalizations, frequently provide clues as to relationships in cases where few other data are available. In the following paragraphs in this section, therefore, these aspects are covered in some detail.

Traylor divided the Tyrannidae into three main groups, with the genera *Tityra* and *Pachyramphus* forming a fourth, explicitly more distant, subfamily, and *Xenopsaris* isolated as being of uncertain position (*incertae sedis*). For the three typical groups he preserved the subfamily names Elaeniinae, Fluvicolinae and Tyranninae that had been used by early taxonomists such as A. H. Garrod, P. L. Sclater, H. von Berlepsch, R. Ridgway, H. von Ihering and C. E. Hellmayr. The last two authors, especially, relied extensively on variations in nest form as a means of recognizing subfamilial divisions within the family. Traylor did the



The genus Tityra *contains a trio of distinctive species, the commonest of which is the* ***Masked Tityra****. With their white plumage, sluggish behaviour, unusual internal anatomy, and weird guttural croaking calls, tityras are not closely related to the rest of the tyrant-flycatcher assemblage. Along with* Pachyramphus *and* Xenopsaris*, they are placed in the subfamily Tityrinae, a category best viewed as a sister-group to the true tyrant-flycatchers. Future research may disband the Tityrinae, and redistribute its constituent genera amongst other problematic tyrannoid families, but at the moment such a revision is premature.*

[*Tityra semifasciata costaricensis*, La Selva Biological Reserve, Costa Rica. Photo: Marco Saborío]

*The **Greyish Mourner** has been transferred back and forth between the Tyrannidae and Cotingidae for well over a century. Although it has some characteristics of both families, anatomical and behavioural evidence now clearly prove that this species is a true tyrant-flycatcher, related to the large genus* Myiarchus *and its other hole-nesting relatives, including the genera* Casiornis *and* Sirystes. *The very similar mourners of the genus* Laniocera, *however, remain of uncertain relationship outside the true tyrant-flycatchers, and, along with the genera* Schiffornis, Laniisoma *and* Iodopleura, *they probably represent a very primitive divergence from proto-tyrannid ancestors.*

[*Rhytipterna simplex simplex*, Murici Ecological Reserve, Alagoas, Brazil. Photo: Dante Buzzetti]



same, although he also included information from important morphological studies of cranial and syringeal characteristics carried out by, respectively, S. L. Warter and P. Ames. After the appearance of Traylor's classification, a series of exhaustive comparative studies of cranial and syringeal anatomy was published by W. E. Lanyon. The subsequent work of S. M. Lanyon and Prum, focused largely on suboscine groups peripheral to the tyrant-flycatchers, made significant contributions to the current classification of the Tyrannidae. In addition, M. McKittrick undertook a comprehensive analysis of monophyly in the group, and numerous investigators have carried out studies of key tyrannid subgroups based on protein allozymes, DNA sequences, morphology, and behaviour. The massive DNA-DNA hybridization study by Sibley and Ahlquist corroborated many previously proposed relationships, but also suggested certain controversial ones not supported by robust anatomical or biochemical evidence. Until further investigation has been carried out, it is considered better to treat the classification of Sibley and Ahlquist, and specifically the recognition of the subfamily Mionectinae, with a degree of caution.

*After a sequence of incarnations, the unassuming "cinnamon manakin", "tyrant-manakin" or simply "neopipo", has been re-invented as the **Cinnamon Tyrant**. This unsettled nomenclature stems from the difficulty of assigning this species to Pipridae or Tyrannidae. Traditionally placed in the former, it is now installed in the latter. It appears to be most closely allied to the Ruddy-tailed Flycatcher* (Terenotriccus erythrurus), *a common and widespread species whose similarity to the "neopipo" was long noted by ornithologists. The Cinnamon Tyrant is partial to stunted forests on sandy soils, where it outnumbers the Ruddy-tailed Flycatcher.*

[*Neopipo cinnamomea cinnamomea*, Alto Tigre, Loreto, Peru. Photo: José Álvarez Alonso]

The three "typical" subfamilies are, on the whole, quite different from one another. Elaeniinae is largely tropical in terms of latitude and elevation, and contains almost half of the tyrant-flycatcher species. Its members are small to medium-sized tyrannids, a large proportion of them being nondescript green birds with a rounded or needle-like small bill, and they forage in densely vegetated habitats. The Northern Beardless Tyrannulet (*Camptostoma imberbe*) is the only elaeniine to extend north of the Mexico-USA border, and even there it occupies only "Mexican" habitats, comprising Chihuahan desert, and cottonwood (*Populus*) riparian zones of Arizona, New Mexico and south Texas. At the southern extreme, a few species of *Elaenia* breed southwards into temperate-zone lowland habitats, and the montane genera *Mecocerculus* and *Anairetes* include several species that reach Argentina, central Chile and even the Juan Fernández Islands. Fluvicolinae is a widespread assemblage of medium-sized to large species possessing a rather large, broad bill, and occupying mainly woodland, montane and temperate forests, and open non-forest habitats such as alpine grassland. This subfamily contains the major radiation of tyrant-flycatchers that forage terrestrially, as typified by the ground-tyrants in the genus *Muscisaxicola*. The third subfamily, Tyranninae, contains the largest-bodied and largest-billed members of the family, and is found mainly in forest canopy and open woodland, forest borders and shrublands from Alaska south to Argentina. This group includes not only the noisy and conspicuous tyrannids of tropical towns, farms and roadsides, such as the kingbirds in the genus *Tyrannus*, but also a huge lineage of more retiring, woodland species that nest in tree cavities, such as the *Myiarchus* flycatchers and related genera.

The three remaining genera, *Tityra*, *Xenopsaris* and *Pachyramphus*, are placed together in a fourth subfamily, Tityrinae. Their relationships are rather obscure, and this arrangement perhaps remains one of convenience rather than an indication of any real affiliation. Indeed, Traylor included this group in Tyrannidae with evident misgivings, remarking that the "Tityrinae are tentatively allied to the Tyrannidae only because their crania more nearly resemble those of the tyrannids than those of the cotingids".

Although rich in species, Elaeniinae contains only a few basic types in terms of morphological and behavioural characteristics. Many of these genera conform to the "little green flycatcher" stereotype for which the family Tyrannidae as a whole is so famous. The basic plumage pattern is olive above and pale to rich yellowish below, with some olive tinge on the breast, indistinct facial markings, double wingbars, and occasionally a concealed crown patch. Indeed, this subfamily contains such a bewildering array of look-alikes that positive species identification in the field often is best accomplished by voice, and even then only after eliminating many species on the grounds of geographical impossibility. With the exception of a few of the *Poecilotriccus* tody-tyrants, sexes are alike in the Elaeniinae. The two antpipits in the genus *Corythopis* are exclusively terrestrial, although the members of several other genera, such as *Pseudotriccus*, spend their lives in dense vegetation within a few centimetres of the ground. The bill varies from small, slender and warbler-like to broad, flattened and spatulate in shape. Most elaeniine species forage by sally-gleaning, making short flights to glean insect prey within dense vegetation, and a large proportion of these species also regularly eat fruit. One genus, *Mionectes*, contains obligate frugivores that have developed a lek mating system more typical of the frugivorous manakins (see Breeding).

The subfamily Elaeniinae includes W. E. Lanyon's "*Elaenia* assemblage", hypothesized as a monophyletic group strictly on





The chat-tyrants form a well-defined group of attractive Andean tyrant-flycatchers. They are sometimes separated into two generic lineages, with a quartet of species, including ***Jelski's Chat-tyrant*** *of south Ecuador and north Peru, placed in* Silvicultrix. *These species inhabit the understorey of humid montane forest, and differ subtly from more open-country, streamside or forest-edge chat-tyrants in their plumage and voice. On the basis of these minor differences, the two groups of chat-tyrants might be sufficiently distinct to separate at the level of subgenera, but molecular evidence argues against the validity of* Sylvicultrix. *In the current work both groups are retained in the genus* Ochthoeca.

[*Ochthoeca jelskii*, Utuana, Loja, Ecuador. Photo: Doug Wechsler/ VIREO]

the basis of a unique configuration of the nasal septum. Its constituent members possess a distinctive, variously sized, transverse trabecular plate located entirely within the nasal septum. The 30 genera involved are separated from one another on the basis of cranial and syringeal characters, nesting behaviour, plumage and external morphology. Excluded from Lanyon's "*Elaenia* assemblage" is a heterogeneous group of other genera, many of which so closely resemble those within the assemblage that their inclusion within the loosely defined subfamily Elaeniinae is deemed to be justified. The huge assemblage of tody-tyrants and pygmy-tyrants is also annexed to this subfamily, though for many reasons it may be better considered a subfamily of its own, as in the past. Herein, the differences are recognized by the adoption of two tribes, Elaeniini and Platyrinchini.

Once treated as consisting of just a few species, the genus *Phyllomyias* was expanded by Traylor to encompass a number of small tyrannulets that had previously been separated into several other genera, *Xanthomyias*, *Acrochordopus*, *Tyranniscus* and *Oreotriccus*, mainly on the basis of their tarsal scutellation. The most extreme example is that of the Rough-legged Tyrannulet (*Phyllomyias burmeisteri*). For a long time, this species was even excluded by taxonomists from the family Tyrannidae because it



In the 1970s, Pogonotriccus *and* Capsiempis *were merged into* Phylloscartes *on the basis of external similarities. However, the expanded genus fell into two distinct behavioural groups: the "true"* Phylloscartes *tyrannulets, with an active foraging style, and a habit of holding the tail steeply cocked; and the bristle-tyrants, a group of more stolid species, none of which cocks its tail, and all of which have the odd, as yet inexplicable, habit of raising one wing momentarily over the back. This latter group, typified by the* ***Marble-faced Bristle-tyrant****, is returned to the genus* Pogonotriccus.

[*Pogonotriccus ophthalmicus ophthalmicus*, Nariño, Colombia. Photo: Luis Mazariegos]



*The male **Spectacled Tyrant** is unmistakable. He is mostly black with a staring eye surrounded by a swollen rosette of bare yellow skin. His wings are almost entirely white, but this only becomes clear in flight, especially during his impressive somersaulting displays. This species has unusually long legs and often runs about on the ground. Partly due to this behaviour, its position in the sequence has shifted towards the semi-terrestrial negritos* (Lessonia). *However, the pattern of plumage, sexual dimorphism and display suggest a link with the genus* Knipolegus, *with which it has traditionally been associated.*

[*Hymenops perspicillatus perspicillatus*, Depresión del Salado, Buenos Aires, Argentina. Photo: Yves Bilat]

has rough, minutely scaled tarsi, of the "taxispidean" type, whereas the exposed legs of virtually all typical tyrant-flycatchers are enclosed by a "boot" made up of an envelope that almost entirely encircles the leg, a condition known as "exaspidean". The perceived importance of this character reached its zenith in the taxonomic treatments of Ridgway, who excluded a number of otherwise quite typical flycatcher genera from the Tyrannidae strictly on the basis of their tarsal scutes. Tarsal scutellation, however, is variable across the Elaeniinae, and even varies among individuals in a number of flycatcher genera. In modern science, the exaspidean tarsus, although clearly a derived character within the Tyranni, is no longer considered to carry much useful taxonomic information within the Tyrannidae.

All of the twelve species in *Phyllomyias* are extremely similar to one another, but disagreement still exists with regard to the validity of the genus as currently constituted. All are small-bodied, green, treetop-dwelling tyrannulets with a small, rounded bill, which they use for foraging in the manner of vireos (Vireonidae), and they all regularly consume small fruits and berries. They have non-Amazonian distributions, with one group found largely in the Andes and another group in lowlands of north-eastern and south-eastern South America. The Planalto Tyrannulet (*Phyllomyias fasciatus*), the Sooty-headed Tyrannulet (*Phyllomyias griseiceps*) and the Grey-capped Tyrannulet (*Phyllomyias griseocapilla*), the three species constituting the original genus, have both cranial and syringeal features that differ significantly from those of the remaining nine species, a fact that led Lanyon to view the enlarged genus as polyphyletic.

The Yellow-crowned Tyrannulet (*Tyrannulus elatus*), the sole member of its genus, appears closely related to the seven species of *Myiopagis*, and the two genera even share internal features that suggest that they could be merged. Although these eight species look and act like miniature *Elaenia*, to the point that the merging of *Myiopagis* with the latter has been mused over by many taxonomists, internal differences strongly indicate that the two groups are not so closely related as their outward appearances would suggest.

The genus *Elaenia* is one of the largest and most uniform groups in the family. Its 18 members are nondescript, medium-sized olive-green flycatchers with a relatively small bill. Many have slightly elongated crest feathers that are raised during active calling or display, and the adults of slightly more than half of the group have a concealed white, creamy or yellowish crown patch that is revealed only when the crest feathers are erected. Virtually every forest, woodland or scrub habitat from Middle America southwards to central Argentina supports at least one species of *Elaenia*. These tyrannids are ecological generalists, sallying for insect prey both inside vegetation and in short aerial sallies over it. All *Elaenia* species regularly eat fruit. No debate exists with regard to the limits of this genus.

Ornithion, with three species, and *Camptostoma*, with two, are small vireo-like tyrannulets with a sharp, slightly curved bill and lacking rictal bristles, this last character having given rise to the name of "beardless tyrannulet" for the two *Camptostoma* forms. Early taxonomists considered the possibility of merging these genera, and the two do appear to be closely related to one another on the basis of syringeal anatomy and cranial anatomy. Their nests, however, are completely divergent. *Ornithion* builds a typical, small open cup, whereas the nest of *Camptostoma* is a large, globular affair with a side entrance, built within or against a strong support such as a crotch of a tree, a crevice within bark, or a mistletoe (Loranthaceae) or *Tillandsia* clump.

Recent observations have revealed that what was hitherto considered to be the single species in the genus *Suiriri* does, in fact, consist of two species. The Suiriri Flycatcher (*Suiriri suiriri*) has a distinctive display in which members of a pair, on separate perches close together, raise their wings and tail repeatedly while duetting with one another. The discovery of the cryptic species, named as the Chapada Flycatcher (*Suiriri islerorum*), was made when experienced field observers recognized two distinct kinds of display and accompanying duet in a region of the central Brazilian *cerrado* where the two largely allopatric forms meet.

The affinities of *Suiriri* within the Elaeniinae remain uncertain, as the taxon contains an ambiguous suite of anatomical characters, some of which align it with *Elaenia* and others with *Ornithion*. Yet another hypothesis is that this genus is closely related to the scrub-flycatcher genus *Sublegatus*, perhaps so much so that the two should be merged. Both genera are inhabitants of open woodland and dry scrub, and, besides their external similarities, the two resemble each other in certain display characteristics and in dawn song. Intriguingly, *Sublegatus* also consists of a complex of almost identical forms that have been a source of confusion to taxonomists for a century or more. Just as with *Suiriri*, fieldworkers possessing good experience of the vocal



The tyrant-flycatcher assemblage is characterized by a surplus of small greenish and brownish species. Numerically overwhelming, and visually underwhelming, they can cast the aspiring ornithologist into despondency during his or her first trip to South or Central America. With practice, however, even the dullest tyrant-flycatchers can be identified in the field. This bird pauses briefly on a tree-fern, revealing the stubby bill, short tarsus and vireo-like posture of the genus Phyllomyias. *Given that the location is the mountains of coastal Brazil, and the brownish cast to the plumage (including its wing-bars) its identity becomes clear:* ***Planalto Tyrannulet****.*

[*Phyllomyias fasciatus brevirostris*, Itatiaia National Park, Rio de Janeiro, Brazil. Photo: Edson Endrigo]

displays of *Sublegatus* have recently detected yet another, as yet undescribed, cryptic species in this genus, in the region of Guyana and adjacent Venezuela.

It has been hypothesized that *Inezia* is related to *Sublegatus*, with which it shares syringeal and plumage characters, as well as the preference for open scrub and thicket habitats. *Inezia* is yet another genus in which, as with both *Sublegatus* and *Suiriri*, species limits were recently clarified by careful study of vocal behaviour and geography, in this case enabling the Pale-tipped Tyrannulet (*Inezia caudata*) to be separated from the Amazonian Tyrannulet (*Inezia subflava*). The Slender-billed Tyrannulet (*Inezia tenuirostris*), confined to a small area of desert scrub in northern Venezuela, is a peculiar species of uncertain affinities, and with a voice unlike that of the three other *Inezia*. It probably belongs in another genus, possibly of its own.

The three genera *Mecocerculus*, *Anairetes* and *Serpophaga* are usually treated as being closely related, although no definitive evidence for this relationship exists. Indeed, *Mecocerculus* itself has been referred to as a "wastebasket", as it consists of three different species groups that may not even be one another's



Members of the genus Pseudotriccus, *such as the* ***Rufous-headed Pygmy-tyrant****, forage very close to the ground in the understorey of humid montane forests. Given their sedentary lifestyle, they rarely need to flutter more than a few feet, and their wings are very short and rounded. Often highly inconspicuous, many pygmy-tyrants draw attention to themselves with high-pitched vocalizations and, in the case of this genus, a curious habit of producing snapping noises with the bill.*

[*Pseudotriccus ruficeps*, Sierra Sabanilla, Zamora-Chinchipe, Ecuador. Photo: Doug Wechsler/ VIREO]



For decades, the antpipits were included in the gnateater family, Conopophagidae, until studies of their syringeal and cranial morphology showed them to be aberrant tyrannids. Both species in the genus Corythopis *walk about on the floor of rainforest, and sally up to snatch insects from the underside of leaves. This terrestrial lifestyle explains why the legs of the* ***Ringed Antpipit*** *are so robust. Like its congener, its presence is most often betrayed by a loud and distinctive two-note song. Sometimes these species also snap the bill repeatedly in alarm, or in communication between members of a pair near the nest.*

[*Corythopis torquatus sarayacuensis*, Zancudo Cocha, Napo, Ecuador. Photo: Doug Wechsler/ VIREO]

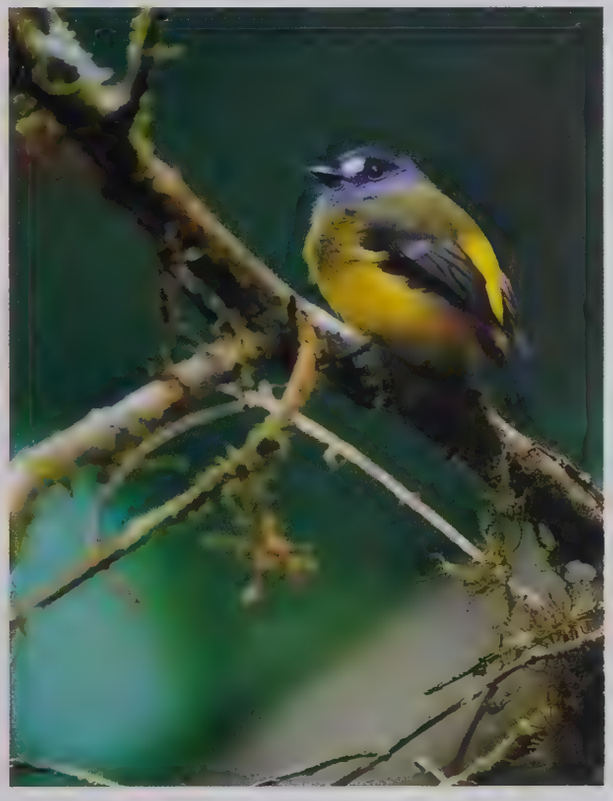
closest relatives. Five of its six species are small, needle-billed, warbler-like tyrannids of the temperate Andean cloudforest, where they are most frequently encountered in mixed-species flocks containing warblers, tanagers (Thraupidae), and other tyrant-flycatchers. Two of these five, the Rufous-winged (*Mecocerculus calopterus*) and Sulphur-bellied Tyrannulets (*Mecocerculus minor*), have syringeal characters that appear to unite them with *Phyllomyias*. The remaining trio of closely related species, the Buff-banded (*Mecocerculus hellmayri*), White-tailed (*Mecocerculus poecilocercus*) and White-banded Tyrannulets (*Mecocerculus stictopterus*), the first two of which form a superspecies, have syringeal and cranial features that, according to some authors, may warrant the placement of all three in a separate genus, closest to *Camptostoma* and *Ornithion*. The White-throated Tyrannulet (*Mecocerculus leucophrys*) stands apart from the other five. More robust than them, it is a long-tailed, upright-perching flycatcher that uses search-and-sally foraging in brushy habitats at the edge of the tree-line, from the high Venezuelan Andes all the way south to Argentina and Chile. Subspecific variation in this species is pronounced, and exhibits a curious pattern in which the northernmost and southernmost forms are almost identical to one another, but are separated geographically by forms that are distinctive in both size and plumage.

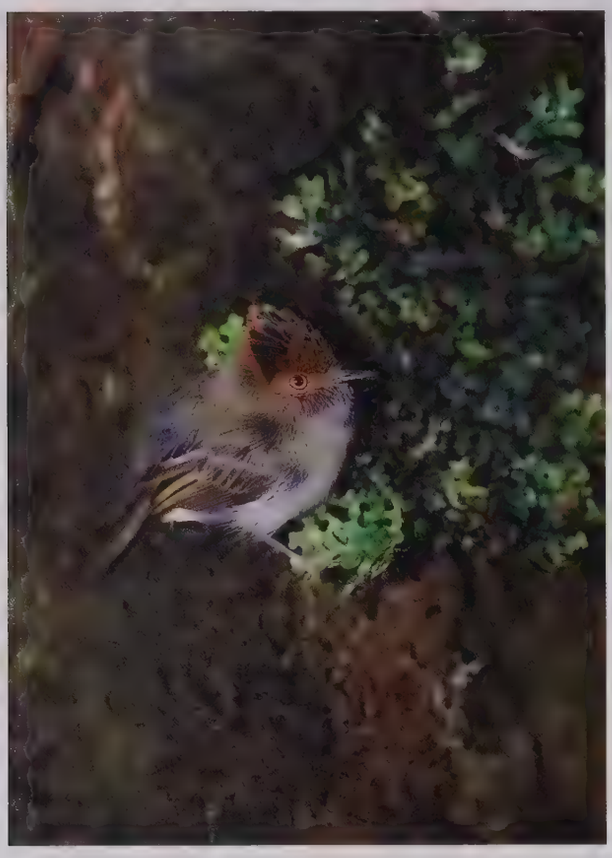
The eight species of *Anairetes* occupy strictly temperate or arid scrub habitats, mainly in the Andes. They are known as tit-tyrants, because their prominent crests and active, perch-gleaning foraging habits are reminiscent of those of many of the true tits and titmice (Paridae). The Agile Tit-tyrant (*Anairetes agilis*) and the Unstreaked Tit-tyrant (*Anairetes agraphia*) have a flatter crest and a longer tail and are sometimes placed in a separate genus, *Uromyias*, but genetic analysis indicates that they represent a clade within *Anairetes*. Syringeal and cranial similarities strongly support a close relationship between *Anairetes* and *Serpophaga*. The latter genus contains five species in two distinct groups. The Torrent Tyrannulet (*Serpophaga cinerea*) is one of a group of three species that are ecologically tied to rivers and streams, where they perch on boulders or muddy banks and make aerial sallies, or sally-glean for prey on other rocks, overhanging vegetation or the water surface itself.

Cocos Island, an isolated tropical Pacific Ocean island located 480 km south of Costa Rica's Osa Peninsula, is the sole home of the Cocos Flycatcher (*Nesotriccus ridgwayi*). This tyrannid occurs in a surprising variety of humid forest and brushy second-growth habitats, exemplifying "ecological release" in the presence of the reduced avifauna on this remote island, which has a surface area of only 24 km². Its bill is unusually long for its body size, and the Cocos Flycatcher's taxonomic position was enigmatic until W. E. Lanyon's studies of cranial and syringeal characters revealed its evident relationship to the aptly named Mouse-coloured Tyrannulet (*Phaeomyias murina*). The latter is a widespread and common inhabitant of lowland and lower montane arid scrub from

With its slaty head, yellow rump and white loral spot the ***Ornate Flycatcher*** *is a delightful creature. In this west Andean race the tail is mostly dark brown, but on the east slope it is fiery orange, producing an even more striking impression. It lives in pairs or small family groups in the understorey of foothill forests, often foraging conspicuously at forest borders and roadside verges. Traditionally placed alongside* Phylloscartes *in the Elaeniinae, its upright posture and active flush-chase foraging technique suggest that it is more closely related to* Myiobius *and* Myiophobus, *in the Fluvicolinae.*

[*Myiotriccus ornatus stellatus*, La Planada Nature Reserve, Colombia. Photo: Patricio Robles Gil/ Auscape]





*The crest of the **Scale-crested Pygmy-tyrant** is hardly visible until it is fanned out and flaunted. Such displays are infrequent, and very little is known about their context. The bright crown-feathering present in many different tyrannid groups is most often directed at rivals during aggressive displays, and at potential mates during courtship. Like most pygmy-tyrants, this species is often abundant but inconspicuous, and much more readily encountered when its distinctive "police-whistle" voice is recognized.*

[*Lophotriccus pileatus squamaecrista*, Río Ñambí Natural Reserve, Nariño, Colombia. Photo: Paul Salaman/ VIREO]

Panama south throughout tropical South America, including the Pacific coast. One hopes that future DNA studies may reveal how long ago some wayward *Phaeomyias* colonized Cocos, subsequently to produce the island's distinctive endemic.

Anatomical evidence, including internal syringeal musculature, attachment of the internal syringeal cartilage, and several characters of the nasal septum, suggests a close relationship between both *Phaeomyias* and *Nesotriccus* and a third monotypic genus, *Capsiempis*, containing the Yellow Tyrannulet (*Capsiempis flaveola*); the affinities of this last, however, continue to defy resolution. Traylor merged the genus with *Phylloscartes*, and it has also been suggested that this form belongs in a group with *Inezia*. Evidence from DNA studies is eagerly awaited, in the hope that it will help to clarify the evolutionary position of *Capsiempis*.

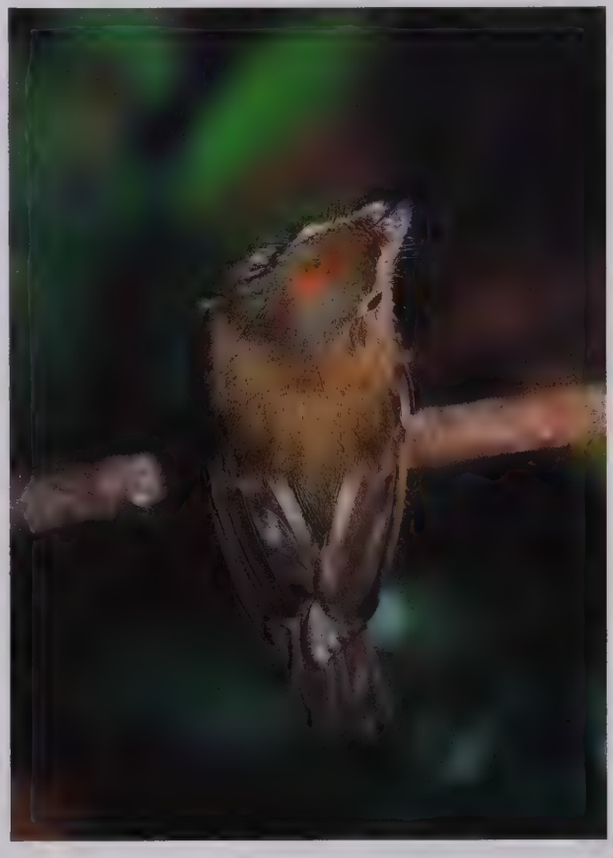
Seven tiny, brownish tyrant-flycatcher species, currently divided among the three genera *Culicivora*, *Polystictus* and *Pseudocolopteryx*, are ecologically distinctive among the Tyrannidae in being restricted to grassland and marsh habitats. One of these, the Sharp-tailed Tyrant (*Culicivora caudacuta*), has a tail with only ten rectrices, which are stiffened and have degenerated barbs, a condition reminiscent of that found in a furnariid genus, the *Synallaxis* spinetails. Because of its distinctive tail, and in the near-absence of anatomical specimens to provide evidence for its relationships, recent authors have considered the Sharp-tailed Tyrant as *incertae sedis*, and have placed it at the end of the subfamily Elaeniinae. *Culicivora* appears to be the only tyrannid genus for which a complete skeletal specimen is lacking in museum collections, but historically it had always been listed adjacent to the two species of *Polystictus*. Until hard evidence to the contrary alters its position, it seems preferable to retain this traditional placement, which acknowledges the fact that these three species exhibit numerous, obviously derived similarities in habits, habitats and plumage colour.

Because of their outward appearance and terrestrial habits, both of which are completely unlike those of other tyrannids, the two antpipits (*Corythopis*) were long thought to be related to the gnateater genus *Conopophaga*, and the two genera were for many years united in the family Conopophagidae. Details of syringeal and cranial anatomy, however, clearly indicate that the two *Corythopis* species are highly aberrant, terrestrial tyrant-flycatchers that belong within the Elaeniinae. The Ringed Antpipit (*Corythopis torquatus*) and the Southern Antpipit (*Corythopis delalandi*) are extremely similar to one another in plumage, behaviour and voice, and could easily be treated as conspecific. Both are completely terrestrial, and while walking along the ground in the deep forest interior they physically resemble the Ovenbird (*Seiurus aurocapilla*), a parulid with a distribution mainly in North America. Rather than picking insects from the litter, however, antpipits sally upwards from the ground to snatch prey from the undersides of leaves (see Food and Feeding).

The peculiar Tawny-crowned (*Euscarthmus meloryphus*) and Rufous-sided Pygmy-tyrants (*Euscarthmus rufomarginatus*) represent another long-standing taxonomic enigma. The genus was at one time excluded from the Tyrannidae altogether, on the basis of its having taxaspidean tarsi, and it was hypothesized that it belonged with the thamnophilid antbirds. Internal cartilage in the syrinx positively identifies *Euscarthmus* as a tyrannid genus, and features of its nasal septum suggest that it belongs within a broad assemblage of *Elaenia* relatives, but other characters place it outside the subfamily Elaeniinae. The only apparently clear thing about these tiny, noisy, scrub-inhabiting flycatchers is that they are not at all closely related to the large assemblage of tody-tyrants and pygmy-tyrants. Besides their internal differences, they build weak cup-shaped nests, as opposed to the long, penduline nests typical of the latter group.

In terms of both internal anatomy and behaviour, the two wagtail-tyrants (*Stigmatura*) stand apart within the Elaeniinae. As the vernacular name implies, these species share the distinctive habit of often carrying the boldly marked tail cocked well over the back as they forage in low vegetation, often near streams. W. E. Lanyon's studies of cranial and syringeal anatomy revealed surprising similarities between *Stigmatura* and another taxonomic enigma, the Grey-and-white Tyrannulet (*Pseudelaenia leucospodia*). The latter is restricted to a small range along the arid Pacific coast of South America. Possessing a bushy crest concealing a large white crown patch, *leucospodia* had floated among several *Elaenia*-like genera, but its bill and external proportions always left doubt. Lanyon's proposal that it is a relictual relative of *Stigmatura*, deserving its own genus, is as good a taxonomic solution as any for this peculiar species.

Understanding of tyrannulet relationships was advanced by Traylor, who realized that a group of species previously placed



*The spadebills are a well-defined group of inconspicuous understorey tyrannids. All have semi-concealed patches of white, yellow or orange on their crowns, as demonstrated by this **Cinnamon-crested Spadebill**. Their most distinctive feature, however, is the shovel-shaped beak, which gives them their name. Bill design relates to foraging strategy, and in this case it is the ideal tool for a bird that darts upwards from low, horizontal perches to snatch insects and spiders from the underside of leaves. Species that feed like this also tend to have prominent rictal bristles.*

[*Platyrinchus saturatus saturatus*, Trinité Natural Reserve, French Guiana. Photo: Olivier Tostain]





*When not displaying, the **Royal Flycatcher** is a retiring and unremarkable inhabitant of the dark forest understorey. It is a short-legged, mouse-coloured bird with a pale rump and a slightly "hammer-headed" look. On closer inspection, the broad-based bill seems unusually long, tipped with a prominent hook and surrounded by lengthy rictal bristles (modified feathers). These almost cat-like whiskers are the longest in the family. Only in display, however, is the bird's real secret revealed. Each feather of the crest is greatly elongated, yellowish-orange in the female, scarlet in the male, and tipped with iridescent violet-black. This crest is fanned out vertically and laterally to produce a peacock-tail of vivid colour. To accentuate the impression, the mouth is usually opened to show a bright orange lining, and the head is tipped from side to side in a steady mechanical fashion. It is postulated that this display occurs in courtship and during intra-sexual competition, but it is very rarely seen in the field. In general day-to-day behaviour, the crest is furled and almost invisible. The Royal Flycatcher is polytypic, and possibly made up of three separate species. The form pictured here is often split as a separate species, then referred to as the "Atlantic Royal Flycatcher" and classified as Endangered because of its low-density population, patchy distribution and the continuing destruction of the Atlantic Forest.*

[*Onychorhynchus coronatus swainsoni*, Marumbi State Park, Paraná, Brazil. Photos: Haroldo Palo Jr.]



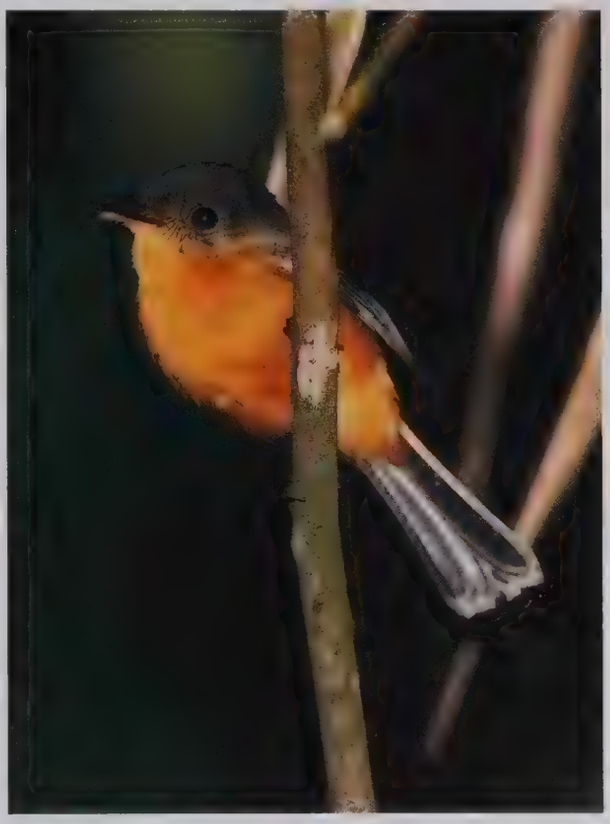
Empidonax *is a North American radiation of small sally-gleaning, upright-perching species with broad-based bills. Several, including the* ***Acadian Flycatcher****, have relatively long wings, as a result of their migratory lifestyle. Although most members of* Empidonax *are notoriously bereft of distinctive morphological characteristics, a good knowledge of subtle field marks, behaviour (especially song) and moult pattern is sufficient to identify all species. A few species are so similar that some individuals cannot easily be distinguished, even in the hand, and are best separated by voice on the breeding grounds.*

[*Empidonax virescens*, Michigan, USA. Photo: Dave Maslowski/ Maslowski Productions]

in "*Tyranniscus*", one of several genera that he subsumed in *Phyllomyias*, displayed both plumage and anatomical peculiarities meriting generic recognition. He named the group *Zimmerius*, in honour of the meticulous taxonomist, J. T. Zimmer, who had first commented on this species group. Anatomically, *Zimmerius* is more closely allied with *Phylloscartes* than it is with the tyrannulets that it superficially resembles, such as those in the genus *Phyllomyias*. In 2001, a distinctive, small-bodied *Zimmerius* species was described from the scrubby, white-sand forest of north-eastern Peru. This odd species, named as the Mishana Tyrannulet (*Zimmerius villarejoi*), appears to be a diminutive relative of the Red-billed Tyrannulet (*Zimmerius cinereicapilla*) of the forested southern Peruvian foothills. The discovery solved a long-standing mystery, as a specimen of this tiny *Zimmerius* had sat for ages in the museum trays of Chicago's Field Museum of Natural History, in the USA, where it had long been suspected to represent an undescribed taxon. Zimmer himself had puzzled over it, and it took the astute hearing of J. Álvarez Alonso and B. M. Whitney to detect an unfamiliar voice in the field and bring to light the identity of this new species.

Treatment of the genus *Phylloscartes* has varied in recent decades. In 1979, with publication of Volume 8 of Peters's checklist, the genus was enlarged to encompass the *Pogonotriccus* bristle-tyrants and even, as mentioned above, the peculiar Yellow Tyrannulet, until then generally placed in the monotypic genus *Capsiempis*. Indeed, when examined in the museum tray, the 24 species involved are surprisingly similar in form and plumage pattern. All are relatively long-tailed and thin-billed, and have rictal bristles that are moderately to well developed; most are bright olive-green above, with prominent wingbars and superciliary stripes, and many have a contrasting facial pattern that includes auricular patches or crescents, as in *Leptopogon*. With the single exception of *Capsiempis*, all are birds of lower montane moist forest. In more recent years, the expanded *Phylloscartes* has been considered universally by specialists in the field as being an unnatural, behaviourally heterogeneous group. Most conspicuously different is *Capsiempis*, consisting of a single, polytypic, locally distributed species occupying dense, tangled, viny or bamboo habitats in tropical lowlands. Its bill is broader, its crown is bushy and occasionally raised into a loose crest, and its tail is occasionally cocked, but otherwise its foraging behaviour is less gnatcatcher-like than is that of typical *Phylloscartes*. *Capsiempis* also has a distinctive social system, with members of the pair often giving a variety of mellow whistled notes and burry, nasal calls that are quite different in quality from the thin, high-pitched chatters uttered by *Phylloscartes* and *Pogonotriccus*. The latter two genera are separated principally on the basis of behaviour, although there seems little doubt that DNA analyses will ultimately bear out the existence of this division within the group.

The 16 species that remain in *Phylloscartes* forage extremely actively, and they do so in the outermost or uppermost vegetation of the forest canopy. The tail is held at or above the horizontal and is occasionally cocked almost vertically over the back, sometimes being flicked upwards once per second and fanned slightly. During active foraging the wings are held out and slightly opened, or flicked outwards repeatedly with the same rhythm as the tail-flicking. The bird itself sometimes flits from side to side as it moves out along a branch, at times even reversing 180 degrees with each flit. Perch-gleans and short-distance outward



The genus Contopus *is one of only four tyrannid lineages whose main radiation is in North or Central America. Seven species breed from Costa Rica northwards, and only three in South America. Their long wings are adapted for aerial prey-capture. The northern forms tend to be migratory, and have even longer wings. The* ***Lesser Antillean Pewee*** *is a resident Caribbean form, with relatively short primaries to match. Like its congeners, it has a very long and broad bill, well-developed rictal bristles, and rather slender tarsi, ideal for a sit-and-wait predator of flying insects. The nominate race is sometimes treated as a separate species.*

[*Contopus latirostris latirostris*, St Lucia, West Indies. Photo: Roland Seitre]

hover-gleans or snatches are frequent. Members of the group recognized as the genus *Pogonotriccus*, comprising the seven bristle-tyrants, forage in a very different manner, typically perching for 10-30 seconds within shaded areas well below the forest canopy, sometimes within a few metres of the ground. These tyrannids, typified by the Spectacled Bristle-tyrant (*Pogonotriccus orbitalis*), appear "large-headed", have an upright stance, and hold the tail pointing vertically downwards; occasionally, they flick one wing high over the back for an instant, a peculiar display shared with *Leptopogon* and *Mionectes*. Bristle-tyrants make upward-directed sally-strikes or upward hover-gleans.

Leptopogon and *Mionectes* share a number of characters that suggest that they are closely related. *Leptopogon* species are not quite so frugivorous as are those in *Mionectes*, but they do regularly eat fruit and have sometimes even been found to have the stomach entirely filled with melastome (Melastomataceae) berries. The two genera also have in common a somewhat unusual nest form (see Breeding). In addition, members of both have the peculiar habit of rapidly lifting one wing straight upwards for an instant while sitting, otherwise motionless, on a perch, a type of behaviour also exhibited by the seven bristle-tyrants in the genus *Pogonotriccus* (see General Habits).

The five species presently constituting the genus *Mionectes* are the most frugivorous of all the tyrant-flycatchers. These are birds of the forest understorey, where they may forage for insects on their own or with mixed flocks, but even more often are found together with manakins around copiously fruiting understorey shrubs or trees, such as melastomes. *Mionectes* is clearly composed of two groups, or subgenera: two species of "true" *Mionectes* that are dark olive overall, with streaked underparts; and three ochraceous-bellied species, typified by the Ochre-bellied Flycatcher (*Mionectes oleagineus*), formerly constituting the genus *Pipromorpha*. Besides sharing numerous characters, both internal and external, the five species in this genus appear to be unique among the Tyrannidae in that the males sing and display at leks (see Breeding).

Yet another monotypic genus of uncertain affinities is *Myiotriccus*. With its black head, bright yellow crest, chestnut tail, and egg-yolk-yellow rump tufts and underparts, the Ornate Flycatcher (*Myiotriccus ornatus*) is one of the most beautiful of all tyrannids. It lives in subtropical Andean forests, where it frequents dark, moist ravines laden with tree-ferns. It is often seen alone or in pairs, making its presence known through the incessant uttering of a loud "pyip" call, but it also moves with mixed-species flocks that pass through its territory. With acrobatic aerial sallies and flush-chases from enclosed perches, it contributes spectacular yellow flashes to some of the darkest interior habitats of the wet Andean foothills. *Myiotriccus* has been allied to the *Phylloscartes* group on the grounds of its syringeal and cranial morphology, but few, if any, fieldworkers find it easy to accept such a grouping. The upright stance, search-and-sally foraging behaviour and concealed bright yellow crown patch of *Myiotriccus* are strongly reminiscent of two genera in the subfamily Fluvicolinae, *Myiophobus* and *Myiobius*, either one of which would appear to be an equally plausible relative of this distinctive species.

One of the most bizarre and most specialized of all tyrant-flycatchers is the Many-coloured Rush-tyrant (*Tachuris rubrigastra*), a species entirely restricted to dense rushes and reeds. It has an extremely slender bill, a slight crest, and quite long legs with strong feet, adapted for perching on the vertical stalks of its marshy habitat. In colour and behaviour, *Tachuris* is unlike any other tyrannid; the bright red crown, blue face, red undertail-coverts, and white flashes on the wings and tail present a startling, harlequin-like pattern of colour among dense reeds. The voice is equally peculiar, consisting of a rapid series of insect-like, unmusical "tic" notes offered from midway up a reed or while the bird flies weakly over the rushes. Internal anatomy provides no insight into the origins or affinities of this most unusual flycatcher, and its nest is equally unique among the Tyrannidae (see Breeding). The evolutionary history and phylogenetic position of *Tachuris* remain mysterious, but the possibility that it represents a colourful offshoot of the marsh-dwelling *Pseudocolopteryx* radiation should be investigated. For the present, *Tachuris* continues to be listed adjacent to other narrow-billed elaeniine genera simply for lack of evidence suggesting any better place within the subfamily.

The smallest-bodied flycatchers make up a remarkable group of 52 species, almost one eighth of the entire family, and the bulk of the tribe Platyrinchini. They are currently treated in eight genera known collectively as the tody-tyrants, which also include the pygmy-tyrants, the tody-flycatchers and the bentbills. These uniformly tiny flycatchers have a disproportionately long bill, in most cases spatulate-shaped, and long, slender tarsi. So far as is

In a family famed for dull coloration, the ***Vermilion Flycatcher*** *stands out from the crowd. The male's crown and underparts are vivid vermilion-red, making him visible from a great distance as he perches prominently and sallies after flying insects. The female is much duller, streaked with brown and white and having only a faint tinge of pink below. This species occurs from the southernmost states of the USA to northern Patagonia, and as far afield as the Galapagos Islands. It usually breeds in open country, but in the non-breeding season it is commonly found over riverbanks and along the brushy shores of ox-bow lakes in Amazonia.*

[*Pyrocephalus rubinus*. Photo: A. & E. Morris/ Birds as Art/Windrush]



known, every one of them builds a purse-like, pendent nest with a side entrance. Their upward-striking foraging behaviour is as stereotyped as that of any tyrannid lineage. Indeed, apart from minor differences in plumage and bill form, the members of this group are all remarkable replicas of one another, a fact that has several ecological implications (see Habitat).

Myiornis, the first of the tody-tyrant genera, contains the world's smallest passerine birds, the closely related Short-tailed (*Myiornis ecaudatus*) and Black-capped Pygmy-tyrants (*Myiornis atricapillus*). They have an average wing length, measured from the bend of the wing to the tip of the longest primary, of about 33 mm. With such tiny, rounded wings and almost no tail, these birds move about with extremely rapid wingbeats in a strange, hovering style of flight that presents the impression of a medium-sized beetle (Coleoptera), rather than a flycatcher.

The Pale-eyed Pygmy-tyrant (*Atalotriccus pilaris*), although placed in a monotypic genus, is closely related to the four *Lophotriccus* species, but it is an inhabitant of scrub and dry woodland, and it lacks the peculiar, laterally orientated crest typical of *Lophotriccus*. Further, it differs from other tyrannids in having its four outer primaries greatly reduced and narrowed, such that they barely resemble wing feathers at all. This structural modification functions, in a still unknown way, in producing the strange wing-buzzing made by this species during its breeding-season display. A similar, and even more specialized, structure of the outer primaries has been shown to be associated with wing-buzzing displays in the doradito genus *Pseudocolopteryx*.

Over the past two decades, the tody-tyrant genus *Poecilotriccus* has undergone considerable enlargement. Originally, the generic name was restricted to the montane Rufous-crowned Tody-tyrant (*Poecilotriccus ruficeps*), a species with a spectacular and anomalous plumage pattern consisting of a bushy, chestnut crown, a yellow wingstripe and a black breastband. Several of these plumage features do also appear in the lowland forms later transferred from *Todirostrum* to *Poecilotriccus*, such as the sexually dimorphic Black-and-white Tody-tyrant (*Poecilotriccus capitalis*) and its close relative the White-cheeked Tody-tyrant (*Poecilotriccus albifacies*). A number of additional species long treated within the genus *Todirostrum* were then moved into the enlarged *Poecilotriccus*, on the basis that they shared the same distinctive syringeal structure; one such example is the Slate-headed Tody-flycatcher (*Poecilotriccus sylvia*). Finally, a beautiful new species, closely related to the Rufous-crowned Tody-tyrant, was described only recently from the slopes of the Marañón Valley, in north-east Peru. It has been named Johnson's Tody-tyrant (*Poecilotriccus luluae*).

The remarkable Black-chested Tyrant (*Taeniotriccus andrei*), still rare in museum collections and until very recently almost unknown in life, had been lumped in the genus *Poecilotriccus* largely on the grounds that it shared plumage similarities and sexual dimorphism with, especially, the Black-and-white Tody-tyrant. *Taeniotriccus*, however, is significantly larger and has an extraordinary, bushy rufous crest with black central feathers, surrounded by a "ruff" of elongated feathers on the nape and sides of the neck. A spray of elongated, stiffened black feathers almost surrounding the eye, and exaggerating its apparent size in life, is unique among the tody-tyrants. K. J. Zimmer and A. Whittaker, who recently discovered this species' presence in eastern Brazil, were able to record that it has a simple, nasal voice, unlike that of all members of *Poecilotriccus*.

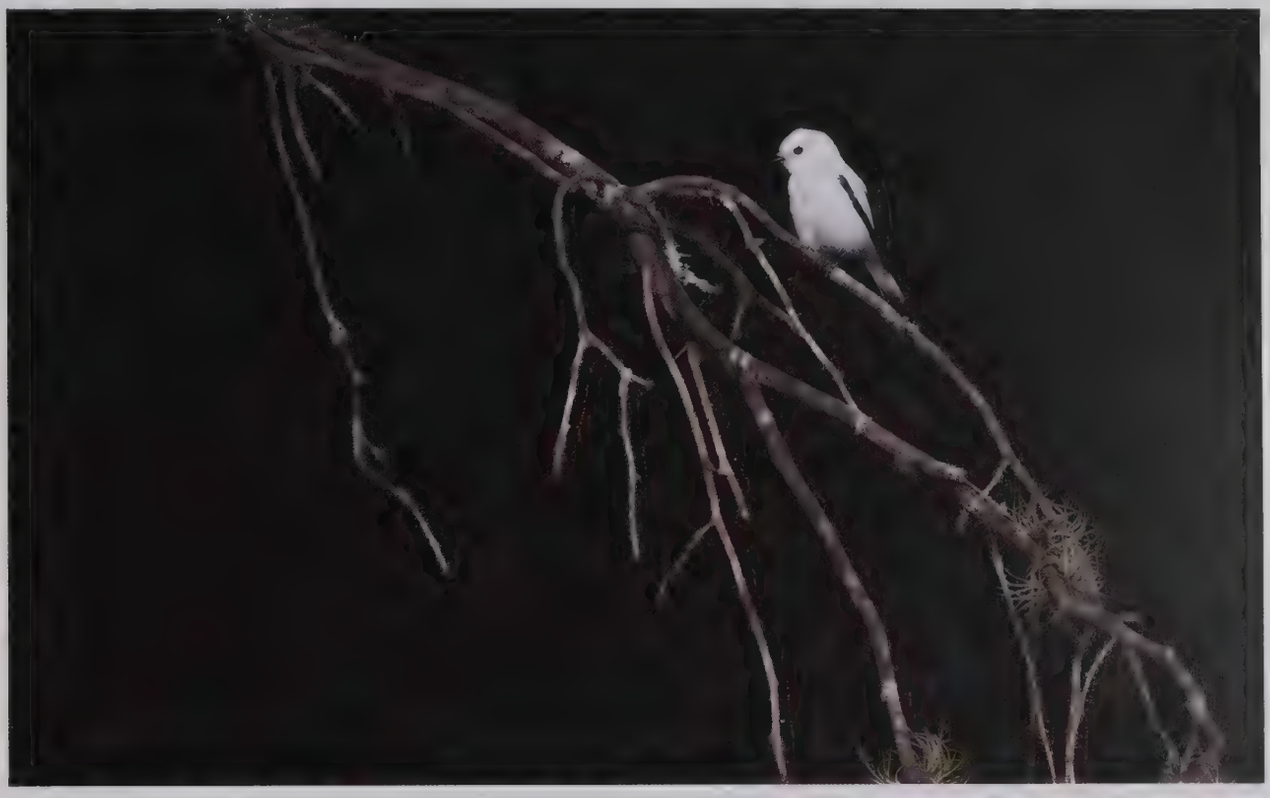
One of the largest genera in the family, *Hemitriccus* numbers 21 species. For a long period, it had been restricted to just three bamboo-inhabiting species with modestly reduced outer primaries, but the genus now encompasses a homogeneous group of pygmy-tyrants many of which, because of morphological idiosyncrasies, had formerly borne generic names of their own. The Boat-billed Tody-tyrant (*Hemitriccus josephinae*), for example, because it has a bill slightly wider than that of the others, was previously placed in *Microcochlearius*. Likewise, Snethlage's Tody-tyrant (*Hemitriccus minor*) was generically separated from the rest on the grounds that its nostrils are distinctively rounded, a character present also in the Yungas Tody-tyrant (*Hemitriccus spodiops*). The Fork-tailed Pygmy-tyrant (*Hemitriccus furcatus*), because of its forked tail with only ten rectrices, all tipped white, was formerly given a separate genus, *Ceratotriccus*. It could be argued that the bentbill genus *Oncostoma*, currently listed next to *Myiornis*, should also be merged with *Hemitriccus*, as its principal generic peculiarity, mentioned in the English name, is simply a minor variation on the pygmy-tyrant theme.

All *Hemitriccus* species are small, brownish-olive to greenish-olive birds with variable striations of olive on the breast, and sometimes washed rusty about the head and throat. The bill is long and slightly spatulate, but not so wide as that of *Todirostrum*. The "brown group" contains six species that have a classic relict



The genus Knipolegus *is a well-defined collection of ten species, most of which are black in the male and brownish in the female. Sexual dimorphism is less pronounced in a few species, such as the* ***Velvety Black-tyrant****, in which the adult female is identical to the male except for the chestnut streaking on her throat, as seen here. Most* Knipolegus *species are conspicuous aerial foragers that perch prominently on low vegetation. Many are migratory: this species undertakes altitudinal movements in coastal Brazil, breeding at the edge of upland forests and descending in winter to open foothill country.*

[*Knipolegus nigerrimus*, Itatiaia National Park, Rio de Janeiro, Brazil. Photo: Edson Endrigo]



The genus Xolmis *is largely restricted to southern Brazil, Bolivia, Paraguay and Argentina. The* ***White Monjita*** *is immaculately, almost luminously, white. It is also known by the name of "ghost bird", not only on account of its ethereal plumage, but because of its habit of perching on headstones in country graveyards. Of course, monjitas will use many perches, including wires, fences, boulders and pylons, indeed any high, open vantage point from which they are able to hunt. They drop to the ground to seize their prey, or snatch it in aerial sallies, often returning to the same perch.*

[*Xolmis irupero irupero*, Río Pilcomayo National Park, Formosa, Argentina. Photo: José & Adriana Calo]

distributional pattern surrounding, but not including, the Amazon Basin. Most remarkable is the complex of three closely related species occupying moist highland forest in three tiny ranges thousands of kilometres apart from one another. These are the Cinnamon-breasted Tody-tyrant (*Hemitriccus cinnamomeipectus*) of the equatorial Andes, the Buff-breasted Tody-tyrant (*Hemitriccus mirandae*), living in the isolated hills of north-eastern Brazil, and Kaempfer's Tody-tyrant (*Hemitriccus kaempferi*), confined to the hills of extreme south-eastern Brazil.

The genus *Todirostrum* is now restricted to a group of seven species that appear to be unquestionably monophyletic. Each has a bill more than one-third the length of the wing, and with long parallel sides and an almost squared tip, producing a spatula-like shape that is indeed convergent on the bill of the true todies (*Todus*). They all forage by making predominantly upward strikes, and their voices are restricted to nasal "tic" notes and chirps. This genus is unusual among small tyrannids in the well-developed vocal duetting performed by members of a mated pair. In parks and shrubby pastures, the Common Tody-flycatcher (*Todirostrum cinereum*) is frequently seen to give an odd display: holding the wings drooped and the tail cocked vertically over the back, the bird hitches sideways along a perch while ut-

The ***Cattle Tyrant*** *is a widespread and familiar South American bird, but it is also a genuine taxonomic enigma. Its plumage resembles the yellow-bellied kingbirds* (Tyrannus)*, even down to the coronal patch, and its display also resembles that of the kingbirds. But unlike kingbirds, it is usually terrestrial, making short flights after insects, or probing in short grass for insects. In rural areas it often feeds around (or on top of) livestock. Of course, this trick predates the arrival of cattle, and presumably was practised on a number of the larger native mammals, such as the capybara* (Hydrochaeris hydrochaeris).

[*Machetornis rixosa rixosa*, Pantanal, Mato Grosso, Brazil. Photo: Fabio Colombini]





Highly elongated rectrices have arisen on at least four separate occasions in the family. In Tyrannus, *for example, the Fork-tailed Flycatcher* (T. savana) *and* ***Scissor-tailed Flycatcher*** *have very long outer tail feathers. This feature led to their separation in the genus* Muscivora, *but they are otherwise typical kingbirds. Both species catch insects in flight, and it is possible that the exceptional outer tail feathers supply extra aerial manoeuvrability, just as it does for swallows. In addition, these fancy tails are shown off during courtship behaviour, and they are presumably favoured to some extent by sexual selection. As in* Hirundo, *tails average much longer in males than in females.*

[*Tyrannus forficatus*, near Amarillo, Texas, USA. Photo: Wayne Lankinen/ DRK]

tering a series of sharp "tic" sounds. Its two allopatric relatives, the Maracaibo Tody-flycatcher (*Todirostrum viridanum*) of the Venezuelan coastal scrubs and the Grey-headed Tody-flycatcher (*Todirostrum poliocephalum*) of south-eastern Brazil, give the same display.

Nine species, collectively known as flatbills, make up two distinctive genera, *Rhynchocyclus* and *Tolmomyias*, which share a number of internal characters, in addition to the distinctively stout, laterally swollen, shovel-shaped bill. These two genera differ in a few syringeal characters and in egg colour, but they also have in common several anatomical features that support the argument that they should continue to be treated as each other's closest relatives. They are species of forest and dense scrubby woodland, and they share several unique behavioural quirks. The nests of both genera, although different in detail, are pendent and ball-shaped, with a recurved, downward-protruding entrance tube, and are regularly placed near active wasp nests. Most peculiarly of all, species in both genera use their nests as temporary roosts or domiciles even outside the breeding season. No other tyrannids are known to utilize their nests in this manner.



With 22 species currently recognized, the genus Myiarchus *is numerically diverse but morphologically homogeneous.* ***La Sagra's Flycatcher*** *is a typical example: brown above, pale below, with a fairly long tail and well-marked pale edges to the wing coverts and inner flight-feathers. Its bill is quite large and slender, an ideal tool for snatching large insects off vegetation in flight or while hovering. Many* Myiarchus *species have longer primaries, but this Caribbean form is resident or only modestly migratory, and its wings are relatively short. Given the extreme similarity across this entire genus, voice and geographical location provide the best clues to identify different species.*

[*Myiarchus sagrae sagrae*, Cayman Islands. Photo: Roland Seitre]



Attilas are unusual tyrannids, and as a result they have spent much of their taxonomic history outside the family. They are robust birds with loud, distinctive songs. The bill is large and strongly hooked. The face is covered with stiff rictal bristles, presumably to protect their eyes against the flapping wings, barbed legs and noxious, urticant hairs of their prey. They are usually found in the middle storey and canopy, but often come low, like this ***Grey-hooded Attila****, to search for food in the understorey or even occasionally on the ground.*

[*Attila rufus rufus*, Intervales, São Paulo, Brazil. Photo: Edson Endrigo]

The legendary T. A. Parker, when he heard an unfamiliar song from the forested river margins along the Amazon River, correctly diagnosed the presence of a previously undetected species of *Tolmomyias*. The new taxon, the Orange-eyed Flycatcher (*Tolmomyias traylori*), was given its scientific name for the great Chicago taxonomist who had comparatively recently completed his exhaustive review of the family. Prior to this discovery, and ironically, two specimens of the new species had been overlooked for decades in the drawers of Traylor's own Field Museum.

It is quite likely that no genus in the Tyrannidae still contains more cryptic species awaiting analysis and detection than does *Tolmomyias*. Special attention should be paid to the Yellow-olive Flycatcher (*Tolmomyias sulphurescens*), in which pronounced variation in vocal behaviour between Middle America and southern Brazil suggests that as many as four or five species could be involved. Although less pronounced, geographical variation in the voices of the widespread Yellow-breasted (*Tolmomyias flaviventris*) and Yellow-margined Flycatchers (*Tolmomyias assimilis*) also warrant careful comparative study.

For a century or so, the exclusively South American genus *Ramphotrigon* was treated as another representative of the flatbill assemblage. Its three species are, however, cavity-nesters, and their internal anatomy, including, for instance, a nearly fully ossified nasal capsule with internal supporting rod, confirms that they are, in fact, members of the *Myiarchus* assemblage in the well-delineated subfamily Tyranninae. The convergence of *Ramphotrigon* with the flatbills with regard to bill morphology attests to the power of evolutionary forces that favour spatulate bills among upward-striking insectivorous birds the world over (see Morphological Aspects).

It is worth emphasizing that the phylogenetic placement of the flatbill and tody-tyrant assemblage as defined by Lanyon remains equivocal. Credible tree-configurations exist whereby this large clade is basal at least to the family Tyrannidae, and possibly to the entire suborder Tyranni (as here defined). Some, though not all, of these species share a largely unossified nasal capsule, and all build distinctive, pendent nests. It is intriguing, too, that the putative phylogeny of Sibley and Ahlquist, based on DNA-DNA hybridization, places at least a portion of this assemblage in its own subfamily, Mionectinae; indeed, these authors felt that this upper-level taxon met their criteria for family status. Nevertheless, as many pygmy-tyrants do have an ossified nasal septum, including a broad trabecular plate, it may be that the loss of this state in certain species and genera carries little phylogenetic information. For the present, placement of the flatbill and tody-tyrant assemblage within the Tyrannidae, adjacent to the more typical Elaeniinae, remains the preferred, conservative treatment, though the acknowledged differences between them are indicated by the recognition of two tribes.

Despite this, if construction of a hanging nest is viewed as a definitive character for the flatbill and tody-tyrant clade, then the remarkable spadebills (*Platyrinchus*) must be excluded, as the three spadebill species for which nests have been documented all build delicate cup-shaped structures at the fork of a branch. On the other hand, syringeal evidence suggests at least a distant affinity with the flatbills, and the spadebills' unique bill shape, with the largest breadth-to-length ratio of all the tyrant-flycatchers, is approached by *Rhynchocyclus* and *Tolmomyias*. Spadebills inhabit the dark forest understorey, where they perch on bare horizontal twigs and, at long intervals, make explosive upward sallies to strike at insects on the undersides of leaves. Typically, most tropical and subtropical forests of Middle and South America support only a single spadebill species, although two species do occur together in tall forest habitats of the western Amazon Basin. The White-crested Spadebill (*Platyrinchus platyrhynchos*) is the largest in the genus, and it forages significantly higher up in the forest understorey than does the smallest species, the Golden-crowned Spadebill (*Platyrinchus coronatus*). The rare Cinnamon-crested Spadebill (*Platyrinchus saturatus*) appears to occur mainly in white-sand forest and scrub.

The highly distinctive Royal Flycatcher (*Onychorhynchus coronatus*) is a slender, buffy-brown flycatcher with unusually short legs, and possesses a very long flattened bill very much like that of a giant tody-tyrant. Its remarkable rictal bristles, the longest in the family, reach the tip of the oversized bill. The feature for which this bird is best known, however, is its elongated and fan-shaped crest, bright scarlet in the male, yellowish-orange in the female, with each feather tipped with iridescent violet-blue. The crest features in a bizarre and unique display (see General Habits).

As species limits of tropical American birds become better understood, the complex of Royal Flycatcher forms currently treated as representing a single, widespread species will prob-



Becards are a distinct group of South and Central American species that only barely sneak into the USA. They are noted for their robust bills, sexual dimorphism, and a highly modified ninth primary. In some species this feather is much shorter than its neighbours and abruptly emarginated near the tip. It presumably functions in sound production during a wing display, but this has not been confirmed. The ***Green-backed Becard*** *is like most of its relatives in that it is a bird of lightly wooded country and the canopy of more extensive forests, it regularly joins mixed-species flocks, and it is most easily tracked down by its voice.*

[*Pachyramphus viridis viridis*,
Intervales,
São Paulo, Brazil.
Photo: Edson Endrigo]

ably be reinterpreted. Most likely to be elevated to the status of a full species may be the subspecies *occidentalis*, restricted to the disappearing dry and semi-humid forests of the Pacific lowlands of west Ecuador and north-west Peru. Both this and the almost unknown Atlantic subspecies, *swainsoni*, confined to a few remnant patches of Atlantic Forest in south-east Brazil, have been treated as full species by several recent authors, and both taxa are listed as globally threatened (see Status and Conservation).

The systematic position of *Onychorhynchus* remains uncertain, as it shares a mosaic of characters with the flatbills, with *Cnipodectes*, with the spadebills and with *Myiobius*. The highly unusual shape of its internal syringeal cartilage is mirrored only by *Platyrinchus*, and the broad bill, unusually long rictal bristles, colourful crown patch and "large-eyed" appearance further suggest that genus. The Royal Flycatcher's remarkably long, hanging nest, however, is totally unlike that of the spadebills, and is most similar to that of the next genus, *Cnipodectes*.

The final member of the subfamily Elaeniinae is the Brownish Twistwing (*Cnipodectes subbrunneus*), alternatively known by the rather less imaginative name of "Brownish Flycatcher". The strange, rotated outer primaries of the adult male (see Morphological Aspects) are its most distinctive feature, whereas there are certainly plenty of flycatchers that are brownish. The taxonomic placement of this odd species within the Tyrannidae is uncertain, but syringeal evidence suggests a relationship with *Onychorhynchus*, and the two also construct the largest hanging nests of any member of the family. Mysteries surrounding *Cnipodectes* have grown considerably with the recent discovery of a highly distinctive new species apparently belonging to this genus. It is a medium-sized, bright cinnamon flycatcher with a bold red-orange iris, and was found in bamboo forest near the Manu River, in south-eastern Peru.

Approximately 130 species comprise Traylor's subfamily Fluvicolinae, a group that differs in only minor detail from Lanyon's "*Empidonax* assemblage". This group is defined primarily by a distinctive, well-ossified nasal septum having a basal trabecular plate bearing an anterior, unossified notch, and ending posteriorly in a V-shaped or Y-shaped fork. This character is found in all but three fluvicoline genera, and nowhere else in the Tyranni.

Fluvicolinae represents by far the most widely varied tyrannid group in terms of the size, form, foraging habits and ecology of its species. Two principal lineages form the bulk of this subfamily. One of these consists of forest and woodland species, most of which are sally-gleaners and aerial hawkers, foraging within the dark interiors or open edges of tall forest, where they use the relatively wide bill bordered by long rictal bristles to snap up arthropod prey. The second lineage contains a wide diversity of species, the centres of radiation of which have been the dry open country south of Amazonia and the temperate grassland of the



Highly migratory tyrannids, such as the ***Western Kingbird****, tend to have long wings. Some of the most impressive migrations are undertaken by kingbirds, and these birds show distinctive morphological adaptations for both powerful aerial sallies and long-distance journeys. Their primaries are markedly notched on the inner web, and the tips of the outer primaries are long and narrow due to sharp attenuation. These characteristics (clearly visible here) echo the wing structure of many raptors, and are believed to improve the efficiency of sustained high-velocity flight.*

[*Tyrannus verticalis*,
North Dakota, USA.
Photo: Dave Maslowski/
Maslowski Productions]



In the avian paradise that is South America, a host of tiny-bodied, short-winged species bear the name "tody-tyrant" or "pygmy-tyrant". In some sites several of these species occur side by side, with finely tuned ecological separation. Most of them are birds of humid forests, and the ***Eared Pygmy-tyrant*** *is no exception. Its range is centred on Brazil's Atlantic Forest, where it occupies most levels from the low understorey to the subcanopy.*

[*Myiornis auricularis auricularis*, Intervales, São Paulo, Brazil. Photo: Edson Endrigo]

southern Andes. Herein, these groups are recognized as two tribes, respectively Contopini (see pages 25-27) and Fluvicolini. Despite the ecological and morphological diversity of the subfamily Fluvicolinae, it does appear to be a well-defined group on the basis of a number of cranial and syringeal characters, and DNA-sequence data now further support the contention that some portions of the subfamily are monophyletic lineages. Comparative analyses of behaviour and body shape reveal several important behavioural and morphological pathways along which this large radiation has evolved.

Myiophobus and *Myiobius* are at present placed at the transition between the flatbills and the *Empidonax*-like tyrannids. The first, *Myiophobus*, is discussed below. Members of the distinctive, enigmatic genus *Myiobius* share numerous characters with *Onychorhynchus*, including unusually long rictal bristles, large eyes, a colourful crown patch, an ossified interorbital septum,



Most tody-flycatchers are birds of brushy country, low, dry forests and shrubland, but the ***Yellow-browed Tody-flycatcher*** *has adapted to the high canopy of humid forests. These birds get their name from a vague similarity to the coraciiform family Todidae. The genus* Todirostrum *is a monophyletic grouping of seven species, all with the same flattened, spatula-shaped bills. Being so small, and living so high above the ground, this particular form very easily passes undetected until its quiet insect-like ticking song is recognized.*

[*Todirostrum chrysocrotaphum*, ExplorNapo Lodge, Iquitos, Peru. Photo: Jordi Bas]

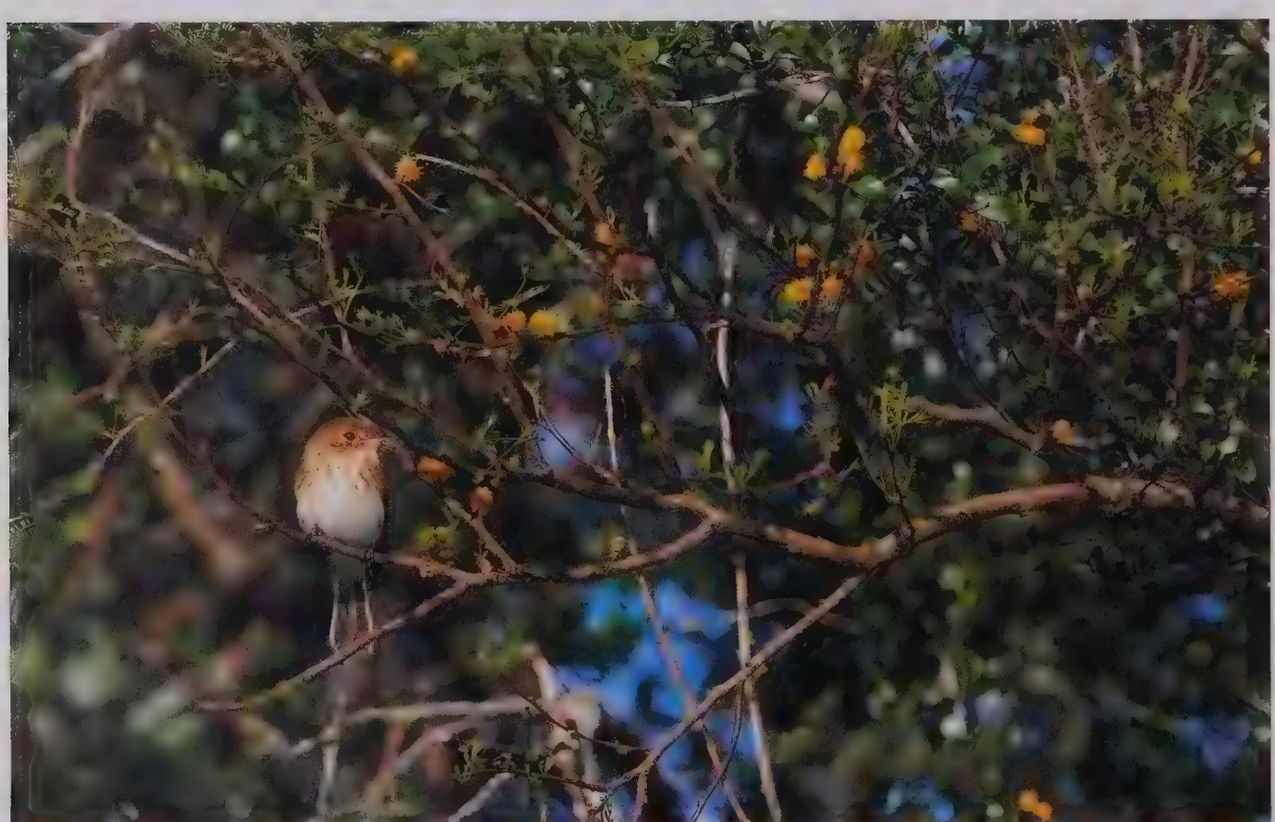


*The **Large-headed Flatbill** is one of more than 80 species of tyrant-flycatcher that co-occur at some sites in south-eastern Peru. This staggering total, the highest congregation of birds belonging to a single family anywhere on the planet, is made possible by narrow niche segregation in a complex habitat mosaic, including mature rainforest, early successional forest along floodplains, and associated wetlands. This species, for example, is locally common in bamboo-dominated forest, and rarely seen away from bamboo.*

[*Ramphotrigon megacephalum bolivianum*, Manu National Park and Biosphere Reserve, Madre de Dios, Peru. Photo: Bernard van Elegem]

and an unusual, derived syringeal character of two fully ossified anterior rings (or A elements) at the head of each bronchus; both genera also build hanging nests. Unlike the Royal Flycatcher, however, all *Myiobius* species practise a mode of foraging that is unique in the Tyrannidae, and reminiscent of that of the American Redstart (*Setophaga ruticilla*). The broad full tail is spread horizontally and the wings are held out from the body, revealing a bright yellow rump patch. A foraging individual rarely stops on a perch for more than a second or two, twitching constantly and fanning the tail. Prey-hunting often begins with an explosive flight at a leaf, knocking an insect off it, this being followed by rapid aerial chases through the open understorey.

With exceptionally long rictal bristles that extend even beyond the tip of its short, broad bill, the Ruddy-tailed Flycatcher (*Terenotriccus erythrurus*) is, in many respects, a miniature *Myiobius*. The syringeal anatomy of *Terenotriccus* is so similar to that of *Myiobius* that Lanyon proposed merging the former into the latter. Such a treatment, however, would disrupt the oth-



*Although the diversity of tyrannids in scrubland and low woodland is lower than in rainforest, a significant proportion of species live in dry or open habitats. The **Bran-coloured Flycatcher** is one example. This widespread form occurs in forest edge, deciduous woodland, degraded habitats and grassland with scattered trees. Southern races migrate to Amazonian riversides during the non-breeding season. Along with the Olive-chested Flycatcher* (Myiophobus cryptoxanthus), *habitat preferences in this species differ from other members of the genus, which are humid-forest birds. Differing also in vocal characters, these two species might merit a separate genus.*

[*Myiophobus fasciatus flammiceps*, El Palmar National Park, Entre Ríos, Argentina. Photo: Julián M. Alonso]

erwise distinctive and cohesive nature of the *Myiobius* genus, as *Terenotriccus* is diminutive, lacks the concealed crown patch, and forages by perching upright with long, deliberate pauses before flush-chasing, sallying or moving. Recently, it has been shown that another diminutive species, long considered to belong in the family Pipridae, is in fact a tyrant-flycatcher closely related to *Terenotriccus*. This is the Cinnamon Tyrant (*Neopipo cinnamomea*), formerly called the "Cinnamon Manakin". Besides having almost identical plumage patterns, both the Ruddy-tailed Flycatcher and the Cinnamon Tyrant also exhibit syndactyly, having the outer two toes fused. This character is rare in tyrannids, although versions of it are common among manakins.

Although the Ornate Flycatcher was discussed above, it bears mention again here. While some features of its internal anatomy suggest an alliance with the *Phylloscartes* assemblage in the subfamily Elaeniinae, in which it is currently placed, others suggest that it belongs in the Fluvicolinae, allied with *Myiobius*, *Terenotriccus*, *Neopipo* and *Myiophobus*. Indeed, its upright posture and active, flush-chase sallies in the forest understorey would appear to make *Myiotriccus* far more "at home" as a member of this group.

Analyses of a number of internal and external morphological characters indicate that the genus *Myiophobus* is probably a sister-group to the foregoing assemblage and the following two genera, *Pyrrhomyias* and *Hirundinea*. It now seems highly likely that this genus is polyphyletic, as virtually every taxonomist who has studied it has puzzled over one or more of the species. Four of these, the Roraiman (*Myiophobus roraimae*), Orange-crested (*Myiophobus phoenicomitra*), Ochraceous-breasted (*Myiophobus ochraceiventris*) and Orange-banded Flycatchers (*Myiophobus lintoni*), may need to be removed to their own genus, as their skulls do not show the typical fluvicoline architecture.

All *Myiophobus* are small, upright-perching flycatchers of humid forest, seven of the nine species being confined to the subtropical zone of the Andes or to isolated tepuis of southern Venezuela. Only three have a continuous range of more than about 650 km. Wide disjunctions in distribution characterize several of the species. The Roraiman Flycatcher, for example, is known from southern Venezuela, two mountains in central Peru and a small region in south-eastern Peru, and two sites in the Andes of Bolivia. Altitudinal segregation is sharply defined among members of this genus, such that as many as four species may occur on the same mountain slope but with no two of them occupying the same elevational zone. The narrowness of some of these altitudinal zones probably explains why some of the species became extinct in certain areas, and why most of them are rare in collections. Their known distributions will no doubt continue to expand as the eastern Andean slopes are explored more fully. So far as their true relationships are concerned, DNA-sequencing will be necessary before it can be determined with any degree of confidence whether one, two or even three different genera are involved in this group.

In sharp contrast to the locally occurring, ecologically narrow subtropical species in this genus, the Bran-coloured Flycatcher (*Myiophobus fasciatus*) is a common, relatively easily observed species in the underbrush of tropical woodland and second growth from Costa Rica south to Argentina. Curiously, however, its apparently closely related allospecies the Olive-chested Flycatcher (*Myiophobus cryptoxanthus*) is very poorly known, and is restricted to the foothills of southern Ecuador and northern Peru. Both species are typical *Empidonax*-like tyrannids, foraging with aerial hawking and sally-gleaning within dense vegetation, especially near openings and edges. They may belong in a separate genus of their own.

The Cinnamon Flycatcher (*Pyrrhomyias cinnamomeus*) and the peculiar Cliff Flycatcher (*Hirundinea ferruginea*) appear to be closely related, and may form a monophyletic assemblage with the aforementioned *Myiobius*, *Terenotriccus* and *Neopipo*. *Pyrrhomyias* has more or less typical tyrannid proportions and upright-perching habits, although, in accordance with its obligate aerial hawking behaviour, its wings are longer than normal and its tarsi shorter. This species has a classic subtropical distribution, occurring at elevations of 1000-2500 m on the steep, moist Andean slopes in a band almost 6000 km long and only a few kilometres wide, from coastal Venezuela south to northern Argentina. It forages at forest openings, at small outcroppings, and along the edges of waterfalls.

Pyrrhomyias shares with *Hirundinea* a unique combination of syringeal and cranial characters, as well as an overall rufous plumage, including unusual patches of rufous on the wings, and an oddly "pinched" tip of an otherwise rather wide bill. The two species' distinctive calls are reminiscent of each other, although that of the Cliff Flycatcher carries much farther. Both build cup-shaped nests on cliff ledges. The Cliff Flycatcher's extremely



*One of the most ecologically specialized tyrannids, the **Sulphury Flycatcher** is seen here on its favourite kind of perch, the frond of a moriche* (Mauritia) *palm. This distinctive plant occurs in low-lying Amazonian sites, and the flycatcher is rarely seen away from large stands of this palm. When it does occur elsewhere, it is usually found in swampy areas which have palms dotted about among scattered trees. In general, this is a scarce and localized species, probably because of its specialized habitat preferences.*

[*Tyrannopsis sulphurea*, Roraima, Brazil. Photo: Arthur Grosset]



The most abundant and widespread species of Anairetes *is the* ***Tufted Tit-tyrant****. Like most of its close relatives it is an open-country bird, most frequently found amidst low shrubs on semi-arid Andean hillsides, or on the plains of Patagonia. The genus as a whole contains eight species, . most of which are known for their tit-like hyperactive perkiness and their prominent crests. Few other small flycatchers occur at such high altitudes or latitudes.*

[*Anairetes parulus*, Neuquén, Argentina. Photo: Darío Podestá]

unusual proportions, with tiny, short tarsi and long, pointed wings like those of a swallow (Hirundinidae), make sense in light of its unparalleled specialization on aerial hawking from perches on cliff faces. It is easy to imagine such a specialized species evolving from a more typical, *Pyrrhomyias*-like ancestor that hawked insects from the cliffs of an emerging Andean mountain chain.

Although currently positioned next to *Sayornis* at the end of the tribe Contopini, *Mitrephanes* appears in fact to be a perfect transitional genus connecting the two distinctive montane species just mentioned and the widespread radiation of pewees (*Contopus*). For hours on end, and day after day, the little buffy-olive Tufted Flycatcher (*Mitrephanes phaeocercus*) sits on leafless perches above the humid forest canopy, sallying into the open air near moist vegetation and returning to the same perch. Anatomically and morphologically, as well as behaviourally, the two *Mitrephanes* species are miniature pewees. They have a remarkable dawn song (see Voice).

Only four major evolutionary radiations of tyrant-flycatchers have occurred in North and Middle America, these being *Contopus*, *Empidonax* and relatives, *Tyrannus* and *Myiarchus*. The *Contopus* pewees include seven species that breed from Costa Rica northwards, four that are exclusively West Indian, and only four in South America, with one doubling up in the first and third groups. This is a well-defined genus of medium-sized to large flycatchers with distinctive, whistled songs, a disproportionately long and wide bill, well-developed rictal bristles, long wings, and short, rather slender tarsi. All have highly stereotyped foraging behaviour, sitting for long periods on conspicuous perches in the open, the head moving rapidly from side to side, and launching into acrobatic aerial hawking manoeuvres after flying prey. The largest species in the genus is the Olive-sided Flycatcher (*Contopus cooperi*), formerly known as *Nuttallornis borealis*, which breeds in Canadian spruce (*Picea*) bogs and in high montane forests of spruce and fir (*Abies*, *Pseudotsuga*) in western North America. The Eastern (*Contopus virens*) and Western Wood-pewees (*Contopus sordidulus*) and the Greater Pewee (*Contopus pertinax*) complete the geographical division of North America, so that almost any patch of forested habitat has one, and only one, pewee species breeding in it.

A large assemblage of *Empidonax*-like genera forming what seems to be a clear, monophyletic clade includes an array of North American species in *Empidonax*, four Middle American flycatchers in the genera *Aphanotriccus* and *Xenotriccus*, and three wide-ranging South American forms in *Lathrotriccus* and *Cnemotriccus*. All are small to medium-sized, large-headed, upright-perching species with a broad bill, and all forage mainly by a mixture of aerial hawking and sally-gleaning within rather open vegetation, such as the lower levels in scrub, open woodland and river-edge forest.

On the basis of both cranial and biochemical evidence, the genus *Lathrotriccus* was erected relatively recently, by the Lanyon father-and-son team, as a means of distinguishing two South American species from the other *Empidonax* relatives. One of these, Euler's Flycatcher (*Lathrotriccus euleri*), is widespread in scrubby lowland forest and dense second growth, whereas the other, the Grey-breasted Flycatcher (*Lathrotriccus griseipectus*), is restricted to western Ecuador and northern Peru, where it occupies semi-arid forests. The widespread Fuscous Flycatcher (*Cnemotriccus fuscatus*) is a large-billed relative, replacing Euler's Flycatcher in tropical scrub and open-forest habitats.

Aphanotriccus and *Xenotriccus* are represented by four species with highly restricted ranges. None is well studied, but all look and act very much like large *Empidonax* species. The two members of *Xenotriccus* are restricted to arid brush in the highlands of southern Mexico; one of them, the Pileated Flycatcher (*Xenotriccus mexicanus*), sports a bushy crest, a feature unique within the *Empidonax*-like assemblage. *Aphanotriccus* contains two even more localized forms, one found in Nicaragua and Costa Rica and the other in Panama and northern Colombia.

The discovery that the two South American tyrannids once classified in the genus *Empidonax* did, in fact, merit a genus of their own, *Lathrotriccus*, included the hypothesis that they are closest to *Cnemotriccus* and *Aphanotriccus*. This finding clarified the evolutionary history of the large genus *Empidonax*, which is now seen as a strictly North and Middle American group. *Empidonax* represents another of the notorious flycatcher complexes of extremely similar-looking species that have befuddled birdwatchers and taxonomists alike for more than a century. Ten species are primarily or exclusively North American breeders and five are mainly Middle American, but not a single species breeds south of Costa Rica. These numbers change considerably during the non-breeding season, when all of the North American species migrate to tropical habitats (see Movements).



Once grouped with the other bush-tyrants (Myiotheretes), *the* ***Red-rumped Bush-tyrant*** *has a very distinctive plumage pattern and a smaller, finer bill. These, along with several other anatomical features, explain its placement in its own genus,* Cnemarchus. *Like other bush-tyrants, it is usually found perching boldly on top of shrubs, rocks and stunted trees at high altitudes. It probably ventures higher than any other non-terrestrial tyrannids because of its association with the highest of Andean trees,* Polylepis. *It is not restricted to this habitat, however, and often forages on other types of stunted vegetation, as well as in adjacent* puna *and* páramo. *With a strikingly white crown, a white patch on its tertials, and a bright rusty belly and tail, it is one of the most beautiful of tyrant-flycatchers. This species occurs at very low densities, and can be difficult to find, even in the ideal elevational zone.*

[*Cnemarchus erythropygius erythropygius,* Peru. Photo: Günter Ziesler]

Species differentiation in *Empidonax* has occurred almost exclusively through the development of vocal and behavioural isolating mechanisms, with almost no significant changes in structure or plumage pattern. The North American Willow (*Empidonax traillii*) and Alder Flycatchers (*Empidonax alnorum*) represent one of the most classic cases, in which long-confused sibling species were finally sorted out through careful study of their distinctive songs across their full geographical ranges. R. C. Stein showed that, of two well-known song types, individual birds sing only one, either "fitz-bew" or "fee-bee-o", and that those singing one type rarely respond to songs of the other type. He also found habitat, nesting and distributional differences between birds of known song type, despite noting only slight, statistical plumage differences that could be discerned between large series of each species. A more recent, similar example is the splitting of the "Western Flycatcher" into two species, the Cordilleran Flycatcher (*Empidonax occidentalis*) and the Pacific-slope Flycatcher (*Empidonax difficilis*), following a comprehensive study by N. K. Johnson of geographical variation in morphology, vocal behaviour, ecology and genetics of the two forms. The two species can be distinguished mainly by the primary advertising song, but they also occupy quite different habitats on each side of the Cascade and Sierra Nevada mountain ranges inland from North America's Pacific coast. The story is still unfolding, as many experts familiar with these tyrannids across their ranges suspect that the subspecies *insularis* of the Pacific-slope Flycatcher, confined to the Channel Islands, off south-west California, may itself warrant recognition as a full species.

Most *Empidonax* species are widespread, occupying major biomes of North or Middle America, but a few are more restricted in distribution. The Grey Flycatcher (*Empidonax wrightii*), for example, breeds only in the arid scrublands and deserts of the Great Basin, in extreme south-west Canada and the western USA. The Buff-breasted (*Empidonax fulvifrons*) and Pine Flycatchers (*Empidonax affinis*) breed locally in relatively narrow zones of montane pine-oak (*Pinus-Quercus*) woodland from the USA-Mexico border south to southern Guatemala, the Buff-breasted Flycatcher also having an isolated population in Honduras. Taxonomic limits within the Pine Flycatcher could possibly require some revision, as vocal differences between populations on each side of the Isthmus of Tehuantepec, in Mexico, suggest that more than one form is involved; the implications of these, however, have yet to be assessed. The most localized species in this genus is the Black-capped Flycatcher (*Empidonax atriceps*), resident only in the cloudforests of Costa Rica and western Panama.

All three phoebes (*Sayornis*) are North American breeders, but the Black Phoebe (*Sayornis nigricans*) has a continuous breeding range approaching 10,000 km in length, stretching from California southwards through the Andes to Tucumán, in northern Argentina. Morphologically, *Sayornis* clusters only loosely with the rest of the *Empidonax*-like tyrants of the tribe Contopini, and along with *Pyrocephalus* represents a transitional genus between them and the large assemblage of ground and near-ground specialists in the tribe Fluvicolini.

The Vermilion Flycatcher (*Pyrocephalus rubinus*) is the most brightly coloured member of the entire family. This striking species also has an enormous range, stretching from the south-western USA through most of Middle America and southwards to northern Patagonia. It does not breed in heavily forested areas, as, for instance, in Costa Rica and Panama, and in the Amazon Basin, but it does appear as a non-breeding migrant across large areas of Amazonia. The male has a brilliant, vermilion-red crown and underparts, except in the vicinity of Lima, in Peru, where one of two local colour morphs is a solid sooty brown, with no trace of red. The species is similar to the phoebes in behaviour, generally foraging in open areas, especially near water, and frequently sallying to the ground. This is one of only two tyrant-flycatchers to have reached the Galapagos Islands, where the two subspecies present are orange-red, rather than bright red.

The remainder of Fluvicolinae consists of a large cluster of relatively closely related genera with remarkably diverse body forms and foraging habits. These are the ground-tyrants, shrike-tyrants, chat-tyrants, black-tyrants and their relatives, an assemblage that may be referred to broadly as the "ground-tyrant radiation". This group of 23 genera includes many of the most peculiar plumage adaptations and body forms in the Tyrannidae. The vast majority of these species are associated with open country, from arid scrub and open woodland to unbroken grassland and even barren terrain. Occupation of open, non-forested habitats goes hand-in-hand with ground-related foraging in several genera, and explains features of their speciation patterns as well



In common with most other members of its genus, the ***Black-billed Shrike-tyrant*** *is a solitary bird that lives in open, stony country. Some shrike-tyrants inhabit the windswept plains of Patagonia, but most live on the slopes of the high Andes. This species, the commonest and best known of the group, often perches on stone walls and low roofs in tiny settlements. It prefers to forage from a high vantage point. Some* Agriornis *species thrive in some of the driest parts of the central Andes, where vegetation is very sparse. The Patagonian race,* maritimus, *seen here, has an almost black iris. In this species, iris colour lightens progressively towards the north, and through most of the northern Andes it is white.*

[*Agriornis montanus maritimus*, Laguna Blanca National Park, Neuquén, Argentina. Photo: Julián M. Alonso]

as in their behaviour and morphology. For example, the lineage as a whole is weighted towards species with southern South American distributions. Of the 71 species and 23 genera represented, only 15 species, in eight genera, occur in Venezuela, whereas 17 genera and 43 species are found in Bolivia, and 18 genera and 44 species in Argentina.

Several authors have hypothesized a plausible scenario by which ecological, behavioural and morphological radiation occurred within the ancestry of these open-country tyrants. An apparent evolutionary track exists within the group, from generalized, arboreal foliage-gleaners in coastal or temperate scrubland and elfin forest, as typified by the chat-tyrants in the genus *Ochthoeca*, through intermediate forms occupying more wide-open country but still perching in shrubbery, such as the *Myiotheretes* bush-tyrants, the *Xolmis* monjitas and the *Knipolegus* black-tyrants, to purely terrestrial birds of steppe and barren ground, of which the *Muscisaxicola* ground-tyrants and the field-tyrant *Muscigralla* are examples. This evolutionary pathway is closely linked with gradually increasing morphological and behavioural specializations, the transitional, intermediate steps of which are remarkably well "preserved" among modern-day species. While this evolutionary scenario remains conjectural, a recent phylogenetic analysis by J. Birdsley, using anatomical, behavioural and plumage characters, does in fact corroborate the overall hypothesis reasonably well; it should, however, be noted that, in Birdsley's analysis, the *Empidonax*-like flycatchers fall within the shrub-foraging, basal clades of this assemblage, and not outside it as in the currently accepted sequence. Although a number of anatomical characters serve to unite the group as a whole and to clarify a few relationships among genera, many other relationships still remain ambiguous. It is worth mentioning that as many as 14 of the 23 genera are monotypic, and the precise order in which they are at present listed will almost certainly change as new evidence emerges. A DNA-sequencing analysis may shed further light on this fascinating assemblage.

Ecologically and behaviourally, the two species of negrito (*Lessonia*), long-legged, ground-foraging flycatchers of wet grassland and marshy surfaces, would seem to belong near the ground-tyrants, where they were placed for a century by numerous systematists. Birdsley's recent analysis supports this treatment. W. E. Lanyon, however, found syringeal characters suggesting that *Lessonia* is united with *Pyrocephalus*, and proposed that these two genera cluster together with two other sexually dimorphic genera, *Knipolegus* and *Hymenops*. The remarkably long, straight hind claw of *Lessonia* is presumably an aid when perching on and sallying from wet, marshy vegetation.

The robust-bodied, long-legged Spectacled Tyrant (*Hymenops perspicillatus*) is one of the most distinctive of all tyrant-flycatchers. It is named for its large, fleshy yellow wattle surrounding the eye, a feature found in no other member of the family. The male is jet-black with large white wing patches, and has an oversized, bright yellow bill that matches the wattle in colour. Females are dull, streaky brown, cryptically coloured to match the grassy habitat in which they live. This species breeds in marshes in Uruguay, Paraguay and northern Argentina, where it forages both with aerial sallies and by running along the ground or floating vegetation. The male's white wing patches are barely visible except when the bird flies and, especially, when it engages in its spectacular aerial courtship display (see Breeding).

Of the ten distinctive black-tyrants in the genus *Knipolegus*, many are sharply sexually dimorphic, others less obviously so, and still others not at all. Most are conspicuous aerial hawkers that perch atop shrubs or small trees bordering open country. About half occur in southern Brazil and Patagonia, but two quite uncommon species, the Riverside Tyrant (*Knipolegus orenocensis*) and the Amazonian Black-tyrant (*Knipolegus poecilocercus*), have colonized much farther north, where they are restricted to shrubby riverbanks, the edges of creeks and pools, and shrubby river islands along the Orinoco and Amazon drainages. Reduction or loss of sexual dimorphism is presumably a secondary, derived condition that has occurred independently among several species in the genus. The Rufous-tailed Tyrant (*Knipolegus poecilurus*) occurs in Andean forest openings such as cliff faces and landslides, and the male, in reverting to monomorphic plumage, a primitive trait in the Tyrannidae, has converged on the cryptic, brown female pattern; the female still has somewhat brighter, more conspicuous wingbars. Interestingly, and for unknown reasons, the females of two species, the Velvety (*Knipolegus nigerrimus*) and Crested Black-tyrants (*Knipolegus lophotes*), have taken on an all-black, male-like plumage.

The chat-tyrants in the genus *Ochthoeca* represent a fascinating, exclusively Andean radiation of medium-sized, sallying



The largest member of its genus, the ***White-fronted Ground-tyrant*** *occurs in a relatively small range in Peru, Bolivia and Chile. Within this region it appears to be virtually restricted to cushion bogs, where ice-melt trickles across level ground between humps of tough short-stemmed grass. Fortunately, while this habitat specialization might seem unusually narrow, cushion bogs are a frequent feature of the high-Andean zone. Most other ground-tyrants are adapted to dry, grassy plains, or patches of turf on rocky slopes. Many are birds of exceptionally high altitudes, though one species has colonized low-elevation sandy beaches in the Amazon Basin.*

[*Muscisaxicola albifrons*, Chivas, Peru. Photo: Marc Guyt/AGAMI]



Many tyrant-flycatchers reach their highest population density at the margin of rivers and wetlands, and the ***Torrent Tyrannulet*** *is especially closely associated with the edges of fast-rushing streams. This species spends much of its life perched on boulders, boughs, pebbly beaches, or muddy banks within a metre or two of montane or foothill waterways. In the same genus, the Sooty Tyrannulet* (Serpophaga nigrescens) *and the River Tyrannulet* (S. hypoleuca) *are waterside birds in other parts of South America. They all forage by flitting out to catch insects in flight, and by snatching them off nearby vegetation, rock faces, or the water surface itself.*

[*Serpophaga cinerea grisea*, Tapantí National Park, Cartago, Costa Rica. Photo: Marco Saborío]

tyrannids. Several distinct species groups are involved, one of which has been proposed as constituting its own genus, *Silvicultrix*. The largest and most "chat-like" of the chat-tyrants are distributed through the misty, treeless *páramo* and *puna* zones, where they include the Brown-backed Chat-tyrant (*Ochthoeca fumicolor*), and the arid western ridges, where the White-browed Chat-tyrant (*Ochthoeca leucophrys*) is a representative. Slightly lower in elevation, in the brushy elfin forest at and just below the tree-line, the four members of the "*Silvicultrix* group" are found. These are either dark sooty, as typified by the Crowned Chat-tyrant (*Ochthoeca frontalis*), or dark olive, as is the Yellow-bellied Chat-tyrant (*Ochthoeca diadema*), and all have sharply contrasting, even colourful loral spots. Farther down the slopes live the remaining two species, one of which, the Slaty-backed Chat-tyrant (*Ochthoeca cinnamomeiventris*), is often found perched at the edge of dark, moss-covered ravines and rocky waterfalls.

A recent DNA-sequence analysis strongly supports the monophyly of the chat-tyrants, with the species composing "*Silvicultrix*" embedded in the midst of it. The same study excludes the distinctive Tumbes Tyrant (*Tumbezia salvini*) as basal to this group, supporting its continued recognition as a monotypic genus, sister to *Ochthoeca*. With this phylogenetic position, and as a lowland taxon restricted to the arid Pacific coast of Ecuador and northern Peru, *Tumbezia* is plausibly viewed as a relict of the lowland ancestor that gave rise to the chat-tyrants during the Plio-Pleistocene uplifting of the Andes.

The Patagonian Tyrant (*Coloramphus parvirostris*) is among the few tyrant-flycatchers inhabiting the southern temperate forests of Chile and Argentina. It was briefly lumped in the genus *Ochthoeca*, but it has distinctive internal anatomy warranting its separate generic status. In addition, and unlike *Ochthoeca*, it may make seasonal movements. Certainly, it is a species that deserves further study.

Observant visitors who travel by boat anywhere in the Amazon Basin soon become familiar with the Drab Water-tyrant (*Ochthornis littoralis*), a common inhabitant of brushy river margins and debris-strewn shorelines throughout the Amazonian lowlands. During low-water seasons it nests on clay ledges immediately above the rushing waters of the river. *Ochthornis* has been lumped with *Ochthoeca* in the past, but it differs from the latter in internal characters and, as an ecologically unique species, it remains distinctive enough to warrant separate recognition.

Presumably because both the family as a whole and its component major lineages date back to ancient origins in South America, the tyrant-flycatchers are filled with monotypic genera that have no obvious close relative. The Yellow-browed Tyrant (*Satrapa icterophrys*) is a classic example. This species has been enigmatic to systematists for more than a century, and even modern studies have yielded few clues as to its relationships. An uncommon but conspicuous bird of brushy, open country south of the Amazon, and an austral migrant to the Venezuelan *llanos*, it perches high in the shrubs, where it makes aerial sallies, sally-gleans against leaves, and frequently eats fruit. The Yellow-browed Tyrant has been viewed by some as a distant relative of the *Ochthoeca* chat-tyrants. It is one of the species that is most in need of detailed DNA studies, in the hope that these will help to solve the mystery of its relationships within the fluvicoline tyrannids.

Internal anatomical characters indicate that the three *Fluvicola* water-tyrants and the White-headed Marsh-tyrant (*Arundinicola leucocephala*) form a clade. They also share a close ecological attachment to marsh and lakeside habitats, and species of both genera build a large, messy, globular nest of grass and bird feathers, with a side entrance. The sexually dimorphic marsh-tyrant perches in reeds or at the top of low shrubs and fence posts, sallying into the air or against grass stalks. The striking, bicoloured plumage pattern of the male is highly distinctive among the Tyrannidae, and curiously convergent with that of several independent lineages of marsh-dwelling New World blackbirds (Icteridae) in which the colour of the head contrasts boldly against an all-black body. The water-tyrants, on the other hand, exhibit minimal sexual plumage dimorphism and are, moreover, essentially terrestrial, perching on the ground, on rocky shorelines, or on floating vegetation and sallying actively for spiders and insects near the water surface. The Black-backed (*Fluvicola albiventer*) and Pied Water-tyrants (*Fluvicola pica*), formerly treated as conspecific, replace one another geographically on each side of the Amazon drainage and are almost identical in habits. The third member of the genus, the lovely Masked Water-tyrant (*Fluvicola nengeta*), is much longer-legged and behaves much





Two genera tightly linked with aquatic habitats are Arundinicola *and* Fluvicola. *In this case, the association is not with flowing water, but with stagnant pools, oxbow lakes and marshes. Shared features of plumage, internal anatomy and nesting behaviour strongly support a close relationship between these two genera.* Arundinicola *is a monotypic genus, and in parts of its range the* ***White-headed Marsh-tyrant*** *overlaps with all three species of* Fluvicola. *Although they may occasionally be found side by side at the margins of wetlands, they differ notably in habitat choice and feeding technique. In the Brazilian Pantanal, for example, the marsh-tyrant usually perches on taller vegetation such as reeds and small shrubs adjoining the edges of wetlands, whereas the* ***Black-backed Water-tyrant*** *typically perches on low floating vegetation, often far out onto the water surface. The marsh-tyrant is sexually dimorphic, but the water-tyrants are not.*

[Above: *Arundinicola leucocephala*, Pantanal, Mato Grosso, Brazil.

Below: *Fluvicola albiventer*, Miranda, Mato Grosso, Brazil.

Photos: Edson Endrigo]



One of the most delightful tyrant-flycatchers is almost entirely restricted to reedbeds. The ***Many-coloured Rush-tyrant*** *is unlike any other tyrannid in its striking pattern and gaudy coloration. It is quite common wherever reedbeds fringe the shores of high-altitude lakes in the central and southern Andes and in the lowlands of Argentina. As with many species that habitually perch on vertical stems, the tarsi are long and slender. The bill is fine and has a needle-tip, like a tiny pair of tweezers, for picking minute prey items from the reeds. Like most insectivorous birds that forage while perched, it has lost its rictal bristles. Its true taxonomic position is unclear, but it may be related to the doraditos* (Pseudocolopteryx)*, a group of similar-sized birds that also live in marshy habitats.*

[*Tachuris rubrigastra rubrigastra*,
Boca Budi, Araucanía, Chile.
Photo: Andy & Gill Swash]



While the Great Kiskadee (Pitangus sulphuratus) *is a common and widespread generalist, the* ***Lesser Kiskadee*** *is more of a specialist. Strictly tied to the margins of wetlands, it is captured here in characteristic pose, perched on the stem of a water hyacinth* (Eichhornia crassipes)*, above a floating mat of water lettuce* (Pistia stratiotes)*. It tends to avoid the banks of larger rivers, and prefers slow moving or stagnant waters, where it usually forages in pairs or small family groups and sallies to pick insects and spiders from plants or the water surface, often with a short hover.*

[*Philohydor lictor lictor*, Pantanal, Mato Grosso, Brazil. Photo: Hernán Rodríguez Goñi]

more like a ground-tyrant. This species has one of the most anomalous distribution patterns of any tyrannid, with a widespread population inhabiting open marshes of south-eastern South America and a locally distributed population west of the Andes, in the coastal zone of western Ecuador and northern Peru. Genetic and behavioural studies of the latter would be fascinating, as the subspecies concerned, *atripennis*, almost certainly merits full species status.

Alectrurus is a genus of two black-and-white tyrants ecologically confined to grassland and marshy habitats, and clearly related to the preceding two genera. As with *Arundinicola*, the two *Alectrurus* are sexually dimorphic. Females are cryptically coloured in brown and white, while the boldly patterned males are among the strangest of all the flycatchers. The extremely unusual tail modifications of the males appear to be associated with displays directed at rivals when competing for mates, such behaviour being typical of grassland and marsh-dwelling birds all over the world. Males of the Strange-tailed Tyrant (*Alectrurus risora*) also have the unique characteristic of losing the throat feathers entirely during the breeding season, revealing a patch of bare skin that becomes bright orange.

The ground-tyrant genus *Muscisaxicola* is largely a radiation of high-Andean tyrants, all strikingly convergent on Old World chats, especially wheatears (*Oenanthe*). They are entirely terrestrial, alternately running and stopping on long, slender legs as they search the ground and surrounding air for insect prey. Many of the 13 species are inhabitants of treeless countryside and barren, rocky terrain, where they live side by side with, and can even be confused with, sympatric furnariids such as the miners (*Geositta*). Three species live as far south as Tierra del Fuego, and all of the southernmost species are long-distance migrants (see Movements). One, the Little Ground-tyrant (*Muscisaxicola fluviatilis*), has invaded the Amazon Basin, where it forages along the larger muddy and sandy beaches of slow, meandering rivers and streams.

The genus *Agriornis* contains five species, including the heaviest-bodied tyrant-flycatcher, the Great Shrike-tyrant (*Agriornis lividus*). These are big, robust birds with huge, powerful legs and a shrike-like bill with a severe hook at the tip. Shrike-tyrants, which are found mainly in the high Andes, feed on large terrestrial insects and, occasionally, small birds, but they prefer to hunt from elevated perches such as the brick rooftops of rural houses. The four bush-tyrants in the similar genus *Myiotheretes*, also Andean, inhabit mainly upper cloudforest and the stunted, mossy brush near the timber-line known as elfin forest. They perch on exposed twigs or outcrops, sallying into the air, to vegetation or to the ground for insect prey. Many species of both *Agriornis* and *Myiotheretes*, because they occur in upper-elevation habitats on a variety of separate mountain massifs from Venezuela south to Argentina, exhibit considerable intraspecific variation.

Two spectacular bush-tyrants of the very high Andes are placed in monotypic genera. Both occur well above the tree-line, and are often found as high as 4500 m on dry, rocky cliff faces with scattered cacti, puya or *Polylepis* shrubs. The Rufous-webbed Bush-tyrant (*Polioxolmis rufipennis*) has in the past been placed variously in the genera *Cnemarchus*, *Myiotheretes* and *Xolmis*, but it warrants its own genus on the basis of its unique skull and syringeal characters. This species appears entirely grey when perched, but it flashes brilliant rufous patches in its wings and tail while foraging, sometimes "hang-gliding" or hovering with the tail widely spread, in the manner of a kestrel (*Falco*). The Red-rumped Bush-tyrant (*Cnemarchus erythropygius*), with a striking white crown, large white wing patch, and bright rusty tail and underparts that show brilliantly during foraging, is clearly a candidate for the title of the most beautiful tyrant-flycatcher. Like *Myiotheretes*, in which it has sometimes been included, this is a predatory perch-to-ground specialist hunter.

The monjitas (*Xolmis*) represent a remarkable southern South American radiation. Ecologically, most of these eight species are lowland replacements of the closely related, largely Andean genera *Agriornis* and *Myiotheretes*. Like their relatives, the monjitas are medium-sized to large-bodied birds of open, grassy and brushy terrain and rely heavily on perch-to-ground sallying from low shrubs, fences and utility poles. Four of the species have broadly overlapping ranges from southern Brazil to northern Argentina, and a fifth, the Black-crowned Monjita (*Xolmis coronatus*), migrates to this region from southern Argentina. In contrast to their highland counterparts, monjitas show little range fragmentation or intraspecific variation. Many are strikingly patterned with black and white, especially in the wings, the Grey Monjita (*Xolmis*

cinereus) being a typical example. The various harlequin patterns are dazzling and highly visible as the birds move from perch to perch with long overhead flights. The White Monjita (*Xolmis irupero*) is pure white, with jet-black wings. Its local name of "ghost bird" refers as much to its seeming preference for perching atop gravestones as to its ghostly plumage. The Fire-eyed Diucon (*Xolmis pyrope*), formerly placed in a monotypic genus *Pyrope*, is distinctive within the group, having an all-grey back, whitish underparts and a spectacular, brilliant red iris. Unlike its congeners, which are perch-to-ground foragers, this species is more of an aerial hawker.

Two monotypic genera of southern Brazil and adjacent countries, both having an elongated tail, are of uncertain affinities within the Fluvicolinae. The Streamer-tailed Tyrant (*Gubernetes yetapa*) is among the most spectacular of tyrannids. A very large tyrant of open country, it has a voluminous bill with which it captures very large insect prey mainly on the wing, but also in long, angled sallies to the ground, where it also seizes small vertebrates. Its exceptional tail is convergent with that of two members of the subfamily Tyranninae, the Scissor-tailed (*Tyrannus forficatus*) and Fork-tailed Flycatchers (*Tyrannus savana*), the fork clearly serving to aid aerial manoeuvring during long acrobatic sallies after flying prey. *Gubernetes* differs from all other tyrant-flycatchers in having a conspicuous white "bib" bordered below by a bright chestnut breastband; mated partners engage in elaborate duets accompanied by wing-flapping and tail-raising (see Voice, Breeding). The Shear-tailed Grey Tyrant (*Muscipipra vetula*) perches atop tall trees and sallies into the air for flying prey. It breeds high in the south-eastern Brazilian mountains, but migrates to the lowlands and becomes largely frugivorous during the austral winter. The taxonomic affinities of this peculiar, little-studied tyrannid have long been in dispute, but Lanyon succeeded in assigning it unambiguously to the Fluvicolinae on the basis of characteristics of its nasal septum and syrinx. Its relationships within the subfamily are unknown.

Completing the list of the Fluvicolinae are three monotypic genera the relationships of which are unknown. The Long-tailed Tyrant (*Colonia colonus*) is another black-and-white fluvicoline, but its distinctive internal anatomy, its cavity-nesting habits and its uniquely elongated central rectrices provide few clues as to its relationships within the subfamily. It is an obligate aerial-hawking species of lowland forest openings and clearings, returning time after time to the same perch after long sallies to snatch flying insects, among which it apparently favours bees and wasps (Hymenoptera) in particular (see Food and Feeding). This species has tiny feet, and virtually always perches high on an exposed dead or nearly leafless tree within a clearing, or on an isolated dead limb emerging from the forest edge. It is tempting to speculate that this strong preference for tall, isolated and leafless perches might explain its evolution into a cavity-nester, as this trait is otherwise absent in the Fluvicolinae.

One of the most terrestrial of all tyrannids is the bizarre little Short-tailed Field-tyrant (*Muscigralla brevicauda*), which has unusually long legs, very short, rounded wings, and an extremely short tail. Its legs are so long that the scutellation extends about 10 mm above the tarsal joint, making the legs look like those of a shorebird (Scolopacidae). The species is confined to the arid coast between south-west Ecuador and north-west Chile. In its ecology, its behaviour and its nondescript, grey plumage this species is highly reminiscent of an extreme version of the *Muscisaxicola* ground-tyrants, representing the final stage in the evolutionary pathway towards specialization on ground-foraging. Surprisingly, however, its anatomical characters are unlike those of *Muscisaxicola*, and are so ambiguous that this odd, long-legged flycatcher is currently placed at the end of the Fluvicolinae in a grab-bag of genera of uncertain affinities, all awaiting detailed genetic analysis.

The Cattle Tyrant (*Machetornis rixosa*) is a genuine taxonomic enigma. In plumage it is extremely similar to the yellow-bellied kingbirds in the genus *Tyrannus*, even sharing the same bright orange, semi-concealed crown patch so common among the large, yellow-bellied tyrannines described in the paragraphs immediately below. *Machetornis* forages in wide-open settings, where, like the kingbirds, it often perches high on treetops or utility poles. Even its courtship display is similar to that of the Tropical Kingbird (*Tyrannus melancholicus*). The Cattle Tyrant, however, also routinely rides on the backs of livestock in search of dislodged insects, and even more frequently it walks along the ground, probing and gaping for insects among grass tufts in a manner much more like that of a meadowlark (*Sturnella*) than that of any other tyrant-flycatcher. Its wings are rounded, unlike those of the kingbirds, although it does, like the latter, have pointed primaries. To date, the most important clue as to the evolutionary



All four species of Pseudocolopteryx *are associated with wetland habitats, favouring beds of reeds and sedges. Unlike some other reedbed tyrannids, however, they are inclined to venture into adjoining shrubs. The* ***Warbling Doradito*** *breeds in Chile, Argentina, Uruguay and southernmost Brazil, with some northward movement in the austral winter, when small numbers reach Paraguay and Bolivia. All doraditos are ecologically and morphologically similar, and it is very rare for more than one species to breed at any given site.*

[*Pseudocolopteryx flaviventris.*
Photo: Yves Bilat/Ardea]



Some of the larger tyrant-flycatchers are pugnacious birds. In most cases their aggression is directed to their own kind during fights for territories or mates. At other times it spills over into interspecific behaviour: this ***Great Kiskadee*** *is trying to oust a* ***Tropical Kingbird*** *from its perch. Many tyrannid species live in open country, where they prefer to forage from the tops of bushes.The fearless attitude of tyrant-flycatchers manifests itself most conspicuously in their anti-predator responses, and a Great Kiskadee or kingbird may attack a raptor, crow or vulture so vigorously that it ends up riding briefly on the back of its fleeing enemy. The common tendency for kingbirds to mob larger birds gave rise to their tyrannical reputation, and thus their English name.*

[*Pitangus sulphuratus maximiliani*, *Tyrannus melancholicus melancholicus*, Pantanal, Mato Grosso, Brazil. Photo: Günter Ziesler]



*This **Long-tailed Tyrant** is taking a break between aerial forays to rearrange its plumage. As in all birds, plumage maintenance is vital to tyrant-flycatchers. Because of its aerial foraging strategy, this tyrant perches with its tiny legs on high, prominent twigs, to which it regularly returns after a sally. In many places it seems to specialize on stingless bees. Its most peculiar features are a pair of elongated, blade-shaped central rectrices. The position of these feathers in the central rather than at the sides of the tail, along with their flexibility, suggests that their function is ornamental rather than aerodynamic.*

[*Colonia colonus colonus*, Iguazú National Park, Misiones, Argentina. Photo: Julián M. Alonso]

position of the mysterious *Machetornis* within the Tyrannidae is that its skull appears to be typically fluvicoline, hence its inclusion at the end of this subfamily.

The third subfamily, Tyranninae, is considerably more uniform morphologically than is either of the preceding two. A variety of analyses of this subfamily provide evidence for its monophyly within the Tyrannidae. In particular, a recent comprehensive analysis of the cytochrome *b* and ND2 mitochondrial-gene sequences, carried out by J. Mobley, corroborates the earlier conclusions of monophyly by Lanyon, whose findings were based mainly on cranial morphology, and McKittrick, whose work focused on forelimb musculature.

Tyranninae contains 75 medium-sized to large flycatchers currently divided into 20 genera, eight of which are monotypic. All members of this subfamily are comparatively large-headed but, with the exception of two *Tyrannus* species possessing greatly elongated "scissor" tails, they otherwise have typical tyrannid proportions. The subfamily includes the only successful radiation of open-country flycatchers within North America, the genus *Tyrannus*. It also contains a disproportionately large number of successful species with extensive geographical ranges. Some of these extend from the USA or northern Mexico southwards all the way to central or southern South America. The ecological success of this subfamily is probably a consequence of the tendency among this group to favour well-lit, open habitats and forest edge. In effect, the Tyranninae are distributed along the edges and even "over the top" of most tropical vegetation types, from desert to rainforest. Many of the species are sympatric over large areas, and a good lakeshore or brushy pasture in the tropics can easily harbour up to ten large resident tyrannine flycatchers, most of them among the noisiest and most conspicuous birds in the area. Only a few species live in the deep interior of tropical forest. Presumably as a result of the preference for open country and the migratory habits of many of its species, Tyranninae has successfully colonized the West Indies and produced an endemic radiation there.

Two quite different, evidently monophyletic lineages, each containing a major North American component, make up the Tyranninae. One group consists of the kingbirds (*Tyrannus*) and their allies, including a remarkable array of species and genera that exhibit variations on an unusual colour pattern of bright yellow belly, olive or brownish back, and a bold head pattern of grey or black and white stripes. The other lineage contains the large, widespread genus *Myiarchus* and a collection of smaller, strictly tropical genera, the taxonomic affinities of which were clarified relatively recently. These two groups are herein separated as the tribes Tyrannini and Attilini, respectively.

The kingbirds and their allies are conspicuous, large-bodied, comparatively large-headed tyrannids with a robust bill. Genetic



*In forests, most tyrant-flycatchers are notably absent from the afternoon assembly of understorey birds bathing at streamsides and puddles. They seem to avoid these static bathing sites, preferring instead to make use of the occasional downpour. Heavy rain will often send them to a prominent perch, where they shake out their feathers and ruffle their wings in wet foliage, as demonstrated by this **Rusty-margined Flycatcher**.*

[*Myiozetetes cayanensis cayanensis*, Le Larivot, Matoury, French Guiana. Photo: Olivier Tostain]

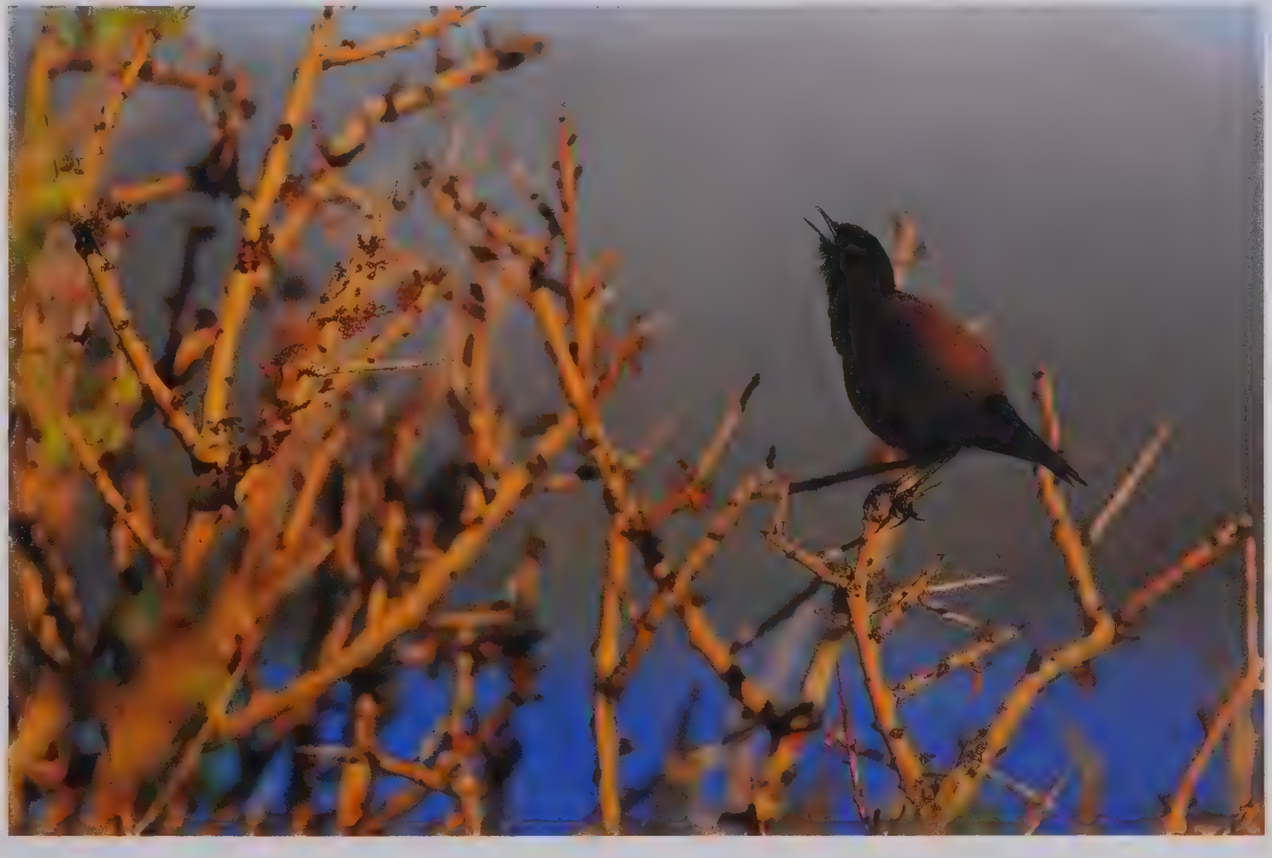
and anatomical studies strongly indicate that the group is monophyletic, and for the most part even the generic and supergeneric affinities are now reasonably clear. All species have a semi-concealed yellow, orange or red crown patch that is revealed as the ample crown feathers are raised during active courtship or aggressive display (see Breeding). Wingbars are absent almost throughout, and several distinctive plumage patterns found only in this assemblage recur across the group. The most frequent of these is typified by the Great Kiskadee (*Pitangus sulphuratus*), which has bright yellow underparts, black and white head stripes, and dull olive to brownish upperparts. This pattern appears also in the genera *Myiozetetes*, *Phelpsia*, *Philohydor*, *Conopias*, *Megarynchus* and, in part, *Myiodynastes*. In a common variant of this pattern, the crown and head are more uniformly grey, sometimes with a whitish eyestripe; this occurs in *Myiozetetes*, *Conopias*, *Tyrannopsis* and *Tyrannus*. A third recurring plumage pattern, found in *Legatus*, *Myiodynastes* and *Empidonomus*, is that of bold stripes of brown and white both below and above, with varying amounts of rufous in the wings, rump and tail.

The Piratic Flycatcher (*Legatus leucophaius*) is an unusual species. It is highly frugivorous throughout the year, and spends much of its time sitting high above cacique and oropendola (Icteridae) colonies, calling incessantly, and occasionally flying off to a fruiting tree to fill up on ripe fruit before returning to its watchpost. Its association with cacique colonies is related to its habit of forcibly appropriating the nests of the larger icterids (see Breeding). The Piratic Flycatcher is highly migratory, moving from both ends of its range into the equatorial latitudes in response to changing availability of fruit within these regions. Several biologists have speculated that individuals of this species may breed at both ends of their migratory routes, but this remains to be confirmed (see Movements).

In open-country settings of the tropics from Middle America southwards to Bolivia and Argentina, species of the genus *Myiozetetes* are among the most conspicuous of tyrant-flycatchers, often living just outside the front doors of human dwellings. Anatomical and DNA studies strongly indicate that this group of four species is monophyletic, and in some parts of the Amazon Basin three of the four may be found together. This is a fruit-eating genus, and all of its members are frequently encountered in the company of parrots (Psittacidae), doves (Columbidae), toucans (Ramphastidae) and tanagers at large fruiting trees, such as figs (*Ficus*) and members of the families Lauraceae and Anonaceae, along the edges of forest or exposed in man-made clearings. By far the most conspicuous and widespread is the Social Flycatcher (*Myiozetetes similis*), one of the first birds encountered in any visit to tropical South America. Despite its English name, this species does not live in social groups but, rather, as endlessly chattering territorial pairs, often nesting in close proximity to one another, with frequent arguments taking place. The rarest and most enigmatic in the genus is the Dusky-chested Flycatcher (*Myiozetetes luteiventris*), much smaller than the others, lacking the conspicuous white supercilium so common throughout this assemblage of genera, and with a much tinier bill and small feet. It is very poorly known, with a spotty distribution across the Amazonian lowlands. At various times it has been switched to the genus *Tyrannopsis*, but recent discoveries of its bulky, grassy nest and its typical *Myiozetetes* syrinx have confirmed its place in this genus.

The nest of the White-bearded Flycatcher (*Phelpsia inornata*) is so distinctive within the kingbird assemblage that, along with an unusual syringeal morphology, it served as a diagnostic generic character. The nest closely resembles those built by the pewees in the genus *Contopus*, a large, neat cup covered with lichens and bound together by cobwebs, and saddled on a horizontal branch. This species was previously placed in the genus *Conopias*, which it resembles physically, but the latter nests in cavities and has quite a different syringeal structure.

No tyrant-flycatcher matches the Great Kiskadee in foraging versatility. This, the sole member of the genus *Pitangus*, is the supreme ecological generalist of the family, and in its behaviour and morphology, with robust body proportions, a large and slightly hooked bill and strong legs and feet, the kiskadee exhibits convergences with the New World jays. Even its loud voice, the most raucous and carrying of any species in the family, bears some resemblance to that of the jays. For a long time believed to be closely related to this species, and formerly treated as congeneric, the Lesser Kiskadee (*Philohydor lictor*) is, by comparison, a much more retiring bird, found almost exclusively low down along the grassy and brushy margins of slowly moving or still water, such as marshes, ponds and oxbow lakes. The sy-



Probably because of the simplicity of their syrinx structure, most tyrannids have very simple songs. This situation is taken to its extreme in the terrestrial, open-country tyrannids, many of which are barely vocal at all. The ***Austral Negrito****, for example, hardly ever utters a sound. It is known to produce quiet alarm notes and a high-pitched twitter on rare occasions, but no true song is known. The negritos are a pair of medium-sized terrestrial species that are distantly related to the ground-tyrants, but probably closer to the sexually dimorphic genera* Pyrocephalus, Knipolegus *and* Hymenops.

[*Lessonia rufa*, Laguna Blanca National Park, Neuquén, Argentina. Photo: Julián M. Alonso]



*The **Southern Beardless Tyrannulet** is a tiny, entirely drab bird. It is widespread and generally common in the forest borders, drier woodland and open shrubland of tropical South America. As with many other small tyrannids, awareness of its distinctive vocalizations reveals that this species is quite common in many areas. Also typical of many tyrannid species, geographical variation exists in its voice, perhaps indicating that more than one species is involved.*

[*Camptostoma obsoletum obsoletum*, El Palmar National Park, Entre Ríos, Argentina. Photo: Julián M. Alonso]

ringes of the two kiskadees have internal cartilages that are utterly dissimilar, and their voices are quite unlike one another, the most common call of the Lesser Kiskadee being a soft, guttural mew. Their nests also differ: that of the Great Kiskadee is a large, bulky ball with a side entrance, whereas the Lesser Kiskadee builds a saucer-shaped cup of twigs and vine tendrils. These dissimilarities led Lanyon to propose the new genus *Philohydor* for the smaller species. The DNA analyses by Mobley supported the contention that the affinities of *lictor* lie well away from *sulphuratus* within the Tyranninae, thus making recognition of *Philohydor* mandatory, despite the striking physical similarities between these two species.

Only two genera closely allied to the kingbirds nest in holes, but whether this behaviour reflects common ancestry or, as Mobley's DNA-sequence data suggest, arose independently remains unknown. *Conopias* contains four small, generalist flycatchers that resemble *Myiozetetes* physically, but generally occur in small openings within more forested habitats. *Myiodynastes* comprises five large-bodied, large-billed species that cover almost the entire range of plumage diversity found across the kingbird assemblage as a whole. Members of the latter genus forage in open forest canopy and understorey, where they snatch large insect prey from leaves, from the air and even from the ground. They also eat large quantities of fruit, especially during the non-breeding season. They have a remarkably wide ecological and latitudinal span. The Sulphur-bellied Flycatcher (*Myiodynastes luteiventris*) breeds in the cottonwood-lined river courses of Mexico north to the USA border, and the very similar Streaked Flycatcher (*Myiodynastes maculatus*) breeds across the lowlands of South America southwards to central Argentina. A third streaked species in this group, Baird's Flycatcher (*Myiodynastes bairdii*), is confined to the arid Pacific lowlands. The remaining two species are much yellower, with less body streaking but retaining the bold head stripes, thereby representing a transition to the kiskadee plumage pattern. The Golden-crowned Flycatcher (*Myiodynastes chrysocephalus*) occupies cloudforest at lower and middle elevations in the eastern Andes, and is replaced in Panama and Costa Rica by the Golden-bellied Flycatcher (*Myiodynastes hemichrysus*).

The Boat-billed Flycatcher (*Megarynchus pitangua*) has the distinction of possessing the largest bill of any tyrannid. Extremely similar to the kiskadees in plumage and body form, this species is widespread throughout tropical forest and forest edges. It lives high in trees, and snatches very large prey, from moths to arboreal snakes and lizards, from the undersides of leaves.

The relatively poorly known Sulphury Flycatcher (*Tyrannopsis sulphurea*), an inhabitant of the Amazon and southern forests, is almost certainly a kingbird ally, and its inclusion within *Tyrannus* has been proposed by some authors. This species, however, differs in many respects, both internally and externally, from the typical kingbirds. It has a very short, squared tail, a relatively short and broad bill, and unusually short legs. Its syringeal structure vaguely suggests a relationship with *Megarynchus*, but it clearly deserves its own genus. This interesting species, much in need of further study, appears to occur mainly in *Mauritia* palm stands, although it is possibly nomadic.

Two peculiar, highly migratory South American species constitute the genera *Empidonomus* and *Griseotyrannus*. These are kingbird-like in aspect and behaviour, being medium-sized, treetop flycatchers that sally for aerial prey and also regularly eat fruit. The Variegated Flycatcher (*Empidonomus varius*) is easily mistaken for the smaller Piratic Flycatcher or the larger Streaked Flycatcher, but is recognized by its bright rusty rump and tail. It migrates from the open country of southern Brazil and Argentina northwards to the *llanos* of Venezuela. The Crowned Slaty Flycatcher (*Griseotyrannus aurantioatrocristatus*), with the longest scientific name of any bird species, has an unusual syrinx and very distinctive slate-grey plumage with a black crown and fiery gold concealed crown patch. Despite the remarkable differences between the two, however, both Lanyon's anatomical analysis and Mobley's DNA-sequence data indicate that the early taxonomists were correct in their assessment that they are closest relatives, and indeed they are still commonly placed together in *Empidonomus*. The DNA data are highly suggestive that this pair of species represents a basal "out-group" to the rest of the kingbird-like assemblage.

Thirteen species make up *Tyrannus*, the type genus of the family and one of the most widespread and familiar flycatcher groups in the New World. These are the kingbirds, so named for the ample crown feathers that give every member of this group a distinctively rear-crested profile. When raised in active display, these bushy crown feathers split into two flanking crests and reveal a fiery red, orange or yellow coronal patch. This genus includes two species, the Scissor-tailed and Fork-tailed Flycatchers, which for a long time were separated in their own genus, *Muscivora*, on the basis of their having an exceptionally long, forked tail. Internal, behavioural and genetic evidence, however, prove that these two species are indeed kingbirds, and their elegant tails appear, moreover, to be independently evolved from two different origins within the genus.

All kingbirds are aerial-hawking specialists inhabiting open country and woodland or forest edges, where they sit on exposed perches, often high overhead, on the lookout for flying insects. They have long pointed wings and a forked tail, both features facilitating powerful aerial sallies and agile flying manoeuvres in pursuit of prey. Many species are highly migratory (see Movements).

Members of the genus *Tyrannus* occur from northern Canada south to southern Argentina and throughout the West Indies, making this the most widespread genus of tyrant-flycatchers and one of the few tyrannid groups to have a centre of radiation in western North America. Eight species breed at least marginally within the USA, although four of these do so just at the northern edges of large tropical distributions. Two are restricted to the West Indies, and one of these, the Giant Kingbird (*Tyrannus cubensis*) of Cuba, has by far the largest bill within this genus of large-billed birds. The Grey Kingbird (*Tyrannus dominicensis*) breeds throughout the Caribbean, including the mainland margins from Florida and Mexico around to Venezuela, and frequently is one of a small handful of bird species inhabiting the tiniest islands of the Bahamas or the Antilles. Only two kingbird species are restricted to South America. These are the Snowy-throated Kingbird (*Tyrannus niveigularis*) of the Pacific lowlands and the White-throated Kingbird (*Tyrannus albogularis*), patchily distributed in grassland from Venezuela to south Brazil.



*The **Grey Monjita** is a bird of scattered tall trees in the* cerrado *and* pampas *of Brazil, Bolivia, Paraguay, Uruguay and Argentina. It is a conspicuous bird, usually perching on the uppermost branches of trees, and often is the largest passerine in the sparsely vegetated habitats of its range. As with its congeners, its voice is entirely unremarkable. It spends the vast majority of its time silent, but during the breeding season it will break into a simple whistled rendition of "peeee, preeu", sounding unexpectedly quiet given the size of the bird. As it sallies into the air or to the ground in pursuit of insects, or passes from perch to perch with strong wingbeats, intermittent glides and dangling legs, it can resemble a small raptor. The Grey Monjita is often mobbed and harassed by smaller passerines, perhaps because it may occasionally take baby birds, as some of its relatives in the genus* Agriornis *are known to do.*

[*Xolmis cinereus pepoaza*, El Palmar National Park, Entre Ríos, Argentina. Photo: Julián M. Alonso]



The evolutionary radiation of the tyrant-flycatchers occurred through many successful modifications of a simple "search-and-sally" foraging mode. Most species are insectivores, and the various discrete foraging modes provide an ecological index by which to subdivide the family. Several genera, including Hemitriccus, *use a technique called the "upward sally-strike". This involves scanning the underside of leaves until prey is spotted, then darting upwards explosively, to snatch the item from the leaf. For this reason, species such as the* ***Pearly-vented Tody-tyrant*** *incessantly peer upwards while they forage.*

[*Hemitriccus margaritaceiventer margaritaceiventer*, El Palmar National Park, Entre Ríos, Argentina. Photo: Julián M. Alonso]

Eight further genera in the subfamily Tyranninae seem to be less close to the preceding twelve, and are grouped together in the tribe Attilini. The phylogenetic affinity between the genera *Rhytipterna*, *Sirystes* and *Casiornis* and the large genus *Myiarchus* is now overwhelmingly supported by both anatomical and behavioural evidence. Indeed, in certain respects, even the generic boundaries within this assemblage are open to question. For the greater part of the twentieth century, *Casiornis* and *Rhytipterna*, along with the genus *Attila*, were treated by taxonomists as belonging in the Cotingidae, excluded from the Tyrannidae on the basis of their tarsal scutellation. Members of both genera are forest and woodland inhabitants that perch for long periods and make bold sallies to snatch or hover-glean very large prey in the dimly lit mid-storey and subcanopy. They often follow mixed-species foraging flocks. Together with the two *Laniocera* species, discussed below, the *Rhytipterna* mourners share with the morphologically similar cotingid genus *Lipaugus* a striking pattern of plumage variation among sister-species. Each has a widespread Amazonian species and a closely related representative in Central America and western Colombia. In each case, the Amazonian form is grey-green and the Central American one is bright rufous. It is not known whether this parallel plumage variation among such ecologically and morphologically similar species is coincidental convergence or a case of mimicry among close competitors. The Pale-bellied Mourner (*Rhytipterna immunda*), although extremely poorly known, is apparently widespread in scrubby white-sand woodland within the Amazon Basin and out into the *cerrado* woodlands to the south, where it sings a peculiar dawn song resembling that of a finch (Fringillidae). This species so closely resembles members of the genus *Myiarchus*, especially the Short-crested Flycatcher (*Myiarchus ferox*), that only its serrated tarsi provide positive confirmation of its generic identity.

For a century or so, the highly distinctive black-and white Sirystes (*Sirystes sibilator*) floated as a flycatcher of unknown affinities, but the discovery of its hole-nesting habits and *Myiarchus*-like internal characters made it much clearer that it is closely related to the latter genus. Indeed, were it not for the striking uniformity otherwise characteristic of the *Myiarchus* flycatchers, argument could be made that *Sirystes* belongs inside that genus, as its only interior-forest representative. As its specific name of "*sibilator*" suggests, the Sirystes is heard far more often than it is seen. It lives almost exclusively in the highest, emergent trees of the tropical forest canopy, but its ringing call (see Voice) gives away its presence.

With 22 currently recognized species, *Myiarchus* is the largest and one of the most widespread of all tyrant-flycatcher genera. Two species, the Great Crested Flycatcher (*Myiarchus crinitus*) and the Ash-throated Flycatcher (*Myiarchus cinerascens*), breed entirely in North America. Two others have a very broad distribution, extending from the south-western USA south to Bolivia and Argentina; these are the Brown-crested (*Myiarchus tyrannulus*) and Dusky-capped Flycatchers (*Myiarchus tuberculifer*). A further six are strictly West Indian, representing the most numerous tyrannid radiation among the Caribbean islands. One species even reached the Galapagos Islands, where it became much longer-legged that its mainland congeners; ecological release appears to be causing the Galapagos Flycatcher (*Myiarchus magnirostris*) to begin converging on the ground-tyrants both morphologically and behaviourally, as this species frequently sallies to the ground for insect prey. The genus as a whole is astoundingly uniform in plumage and structure, and it required painstaking, career-long studies by W. E. Lanyon before species limits within it were adequately determined. A number of species had been "hiding" within other forms, and were revealed only through careful study of their vocalizations. For example, the locally distributed Panama Flycatcher (*Myiarchus panamensis*) and Venezuelan Flycatcher (*Myiarchus venezuelensis*) had for many decades masqueraded as races of the widespread Short-crested Flycatcher, which has a totally dissimilar vocal repertoire. All *Myiarchus* flycatchers build nests inside cavities, and line them with fragments of snake or lizard skin and with mammalian hair.

Discovery that a confusing Mexican endemic, the Flammulated Flycatcher (*Deltarhynchus flammulatus*), nests in holes helped to resolve its systematic position as another member of the *Myiarchus* assemblage. Moreover, details of its syringeal structure and its plumage pattern, characterized by diffusely streaked underparts and distinct wingbars, features otherwise absent among *Myiarchus* and its relatives, pointed to a surprising relationship with the South American genus *Ramphotrigon*. The latter had long been assumed to be related to the other flatbills in



Most tyrant-flycatchers are able to snatch flying insects on the wing, and a few groups are specialized in this foraging mode. Their agility and aerial manoeuvrability are remarkable, for they are often able to surprise the speediest of prey, such as dragonflies and dipteran flies. More commonly, however, they aim for slower-moving targets. This admirable portrait shows a ***Say's Phoebe*** *in flight with its catch. This familiar bird of the western USA has a long, triangular bill designed to trap insects in flight, an action that is often accompanied with an audible snapping of the mandibles. It is most often encountered perched on rock faces and flitting out over open spaces or down to the ground, occasionally hovering motionless in search of a prey item.*

[*Sayornis saya saya*, California, USA. Photo: Dave Maslowski/ Maslowski Productions]

the elaeniine genera *Rhynchocyclus* and *Tolmomyias*, but the cranial anatomy and hole-nesting habits of its three members reveal them as tyrannines related to *Myiarchus*. *Ramphotrigon* is restricted to Amazonia. All three of its morphologically similar species use primarily the upward-strike foraging mode, and their daytime songs are distinctive but plaintive whistles that can easily go unnoticed, although they also have strident dawn songs (see Voice). The widespread, but retiring, Rufous-tailed Flatbill (*Ramphotrigon ruficauda*) is a bird of *terra firme* forest and tall floodplain-forest, where it perches 4-10 m up in the dark, relatively open understorey and whistles its soft, undulating "whooooo-are-you". The other two species have much narrower habitat requirements. The Large-headed Flatbill (*Ramphotrigon megacephalum*) occurs mainly in dense canebrakes and bamboo thickets, often singing its plaintive "coo-koo"; although still rare in museum collections, this species is in fact rather common in its specialized habitat. The Dusky-tailed Flatbill (*Ramphotrigon fuscicauda*), similarly rare in collections, inhabits vine tangles and dense, often swampy, broken forest openings in the western Amazon Basin. Its rapidly falling whistle is accented with an abrupt, upward ending, "peeeeeew-wérp". The plaintive, whistled song of *Deltarhynchus* is reminiscent of these three, adding vocal evidence for its relationship to this group.

The final genus that falls clearly within the Tyrannidae is *Attila*, a remarkable group of seven large-bodied, tropical species formerly placed outside the family because they lack the booted tarsus of typical tyrant-flycatchers. In behaviour and general aspect, *Attila* seems to belong to the *Myiarchus*-like assem-





The most advanced terrestrial foragers are found in the fluvicoline assemblage. Foremost amongst these are the ground-tyrants in the genus Muscisaxicola. *Almost all their foraging occurs on the ground and they are behaviorally and morphologically similar to pipits* (Anthus) *or thrushes* (Turdus). *In fact, all ground-tyrants feed in roughly the same manner, and their foraging style most closely approaches that of the Old World wheatears* (Oenanthe). *They make rapid hopping runs, then suddenly stop and stand erect, often on a small rock, whereupon they may briefly shiver the tail. If they happen to see an insect within range, they pounce towards it and snatch it from the ground. The larger species are sufficiently nimble to catch a lizard on the run. An impressive radiation of* Muscisaxicola *species occurs in the barren-looking mountains of Bolivia, Chile and Argentina, and their diversity is enhanced by ecological partitioning of habitats. As seen here, the* ***Ochre-naped Ground-tyrant*** *is usually found in wet areas such as moist grassland and along the shores of high-Andean lakes, while the* ***Cinnamon-bellied Ground-tyrant*** *prefers dry grassy hillsides strewn with boulders.*

[*Muscisaxicola flavinucha, flavinucha*, Aconcagua Provincial Park, Mendoza, Argentina.

Muscisaxicola capistratus, Meseta del Lago Buenos Aires, Santa Cruz, Argentina.

Photos: José & Adriana Calo]





In the large genus Myiarchus, *many species, such as the* ***Great-crested Flycatcher****, prey on a wide variety of arthropods, even including stinging wasps, bees and ants (Hymenoptera). An extensive survey of this species across the USA during the breeding season revealed that its diet comprised 21% butterflies and moths (Lepidoptera), 17% beetles (Coleoptera), 16% grasshoppers, katydids and so on (Orthoptera), 14% bugs (Hemiptera) and 14% Hymenoptera.*

[*Myiarchus crinitus*, Everglades National Park, Florida, USA. Photos: Rob Curtis/ The Early Birder]

blage within the Tyranninae, and the fact that its members nest in tree cavities supports this notion. Its cranial characters, however, are ambiguous. Many species of *Attila* appear to lack the ossified nasal capsule that unites the *Myiarchus*-like assemblage, including *Deltarhynchus* and *Ramphotrigon*. Nevertheless, Birdsley recently located one specimen of the Cinnamon Attila (*Attila cinnamomeus*) that possesses this character, suggesting that it may vary individually or with age in this genus, and lending some supportive evidence for the inclusion of *Attila* in the *Myiarchus* assemblage.

Attilas are powerful birds of the middle storey of tropical forest and deciduous woodland. The long, powerful, hooked bill is convergent with that of the high-Andean shrike-tyrants and, in common with that group, the attilas often attack and subdue very large prey (see Food and Feeding). The bright yellow iris and the copious growth of stiff, protective feathers around the face add to the menacing look that is characteristic of this genus, thus explaining its scientific name. The Bright-rumped Attila (*Attila spadiceus*) is distributed from southern Mexico southwards through Amazonia, with an isolated subspecies in the Atlantic Forest of Brazil. Its ringing song, a series of sharply rising single or double notes with a final downward-slurred note, is among the most characteristic sounds of a variety of Neotropical forest and open-woodland habitats. This species is one of the very few tyrannids to occur as several distinct colour morphs, bright rufous, dark olive and olive-grey, all having a yellowish belly and a sharply contrasting yellow rump.

The systematics and evolutionary history of the genus *Laniocera* remain utterly confusing. This genus has ridden along with the other "mourners" of the superficially similar genus *Rhytipterna* in being moved back and forth between the Cotingidae and the Tyrannidae, but the recent discovery that one of its two members, the Cinereous Mourner (*Laniocera hypopyrra*), builds a messy, cup-shaped nest indicates that the genus is not a member of the *Myiarchus* assemblage. Fieldworkers familiar with its behaviour and vocalizations have long suspected that, unlike *Rhytipterna*, *Laniocera* is indeed a cotingid, perhaps close to *Laniisoma* in that family. Detailed anatomical studies by Prum and Lanyon recently revealed a number of cranial and syringeal characters supporting the membership of *Laniocera* in a hypothesized monophyletic group of primitive tyrannoids, referred to as the "*Schiffornis* group"; besides *Schiffornis*, which is currently treated in the family Pipridae, this also includes two other tyrannid genera, *Xenopsaris* and *Pachyramphus*, and the two cotingid genera *Laniisoma* and *Iodopleura*. The higher-order relationship of this group to the rest of the tyrannoids, however, remains ambiguous, and evidence from allozyme and DNA-sequence data does not even corroborate the monophyly of such a group. What does seem clear is that *Laniocera* does not belong in the family Tyrannidae. Nevertheless, in the absence of sufficient relevant information, it is retained here for the time being, even though it is recognized that this placement is almost certainly erroneous.

Placed at the end of the family sequence are three genera the systematic position of which is far from clear. For convenience, they are combined in the subfamily Tityrinae, but further research is likely to demonstrate such treatment to be inappropriate. The expanded genus *Pachyramphus*, with 17 species, contains the taxonomically confusing group known as the becards, and includes the three larger-bodied, more uniformly plumaged species formerly treated in a separate genus, *Platypsaris*. While *Pachyramphus* is a well-defined genus, the becards are odd birds, the swollen, bicoloured bill being unique in the Tyranni. Most species are sexually dimorphic, a rare phenomenon in the Tyrannidae; the black, black-and-white or grey plumage of males is replaced with brown in the females. The ninth primary of the male is highly modified, being only about half as long as those on each side of it and abruptly emarginated at its tip. All becards build a huge, bulky stick nest with a side entrance, and the nests are either suspended from an overhanging branch, as in the "*Platypsaris* group", or braced on to the fork of a horizontal limb or crotch of a tree. As mentioned in several places above, the systematic position of *Pachyramphus* appears to be basal to the rest of the family. Morphological evidence and DNA-DNA hybridization data suggest relationships with a so-called "*Schiffornis* group", but the validity of that group has been questioned by the findings of other studies, and both its composition and its placement with respect to the traditional families Tyrannidae, Pipridae and Cotingidae remain murky.

The peculiar and little-known White-naped Xenopsaris (*Xenopsaris albinucha*) occurs in marshy and shrubby, river-edge habitats in northern Argentina and Paraguay and in similar, open habitats in central Venezuela. Over the past hundred years, the genus has been transferred back and forth numerous times be-



Like the Myiarchus *flycatchers, members of the genus* Casiornis *tend to select an open perch overlooking dense vegetation. They slowly bob and swivel their heads, peering around in search of prey. When a suitable morsel has been detected, they usually sally outwards or downwards, snatching it during a brief hover-glean. Because it uses this technique, the bird regularly crashes into vegetation at the point of contact with the victim, then retreats to a nearby perch. In this case the bird is a* ***Rufous Casiornis****, the perch is a tree stump, and the victim is a moth.*

[*Casiornis rufus*, Minas Gerais, Brazil. Photo: Anita Studer]

tween the tyrant-flycatchers and the cotingas. The tarsal scutellation of *Xenopsaris* is of a type found primarily in the cotingas, and its plumage pattern, including a glossy black cap in the male, is similar to that of many *Pachyramphus*. Its compact, cup-shaped nest, built of grasses, is unlike the huge nest built by the becards, but, as a cup-shaped nest is presumably a primitive character in the Tyranni, this factor bears little information about relationships. Anatomical data support the hypothesis that this odd species represents a sister-group to *Pachyramphus*, but the fact that it possesses a unique second pair of internal syringeal cartilages, coupled with its primitive nest structure, argues for its retention in a separate genus.

The three species in the genus *Tityra* are completely unlike the rest of the Tyrannidae, and their systematic position remains as unclear as does that of *Pachyramphus*. They are chunky, sluggish, white-bodied, black-crowned birds of the tropical forest treetops. Allozyme and DNA-DNA hybridization data suggest that these two genera are closely related, perhaps representing their own subfamily within the Tyrannidae. Although this configuration, or a variant that places the group as basal to the rest of the Tyrannidae, is supported by some anatomical data, it is contradicted by others. Most importantly, *Tityra* was excluded from the putative "*Schiffornis* group" on the basis of its more primitive, cotingid-like syringeal characters; it lacks the internal cartilages present in *Pachyramphus* and other tyrannids. *Tityra* does, however, have an enlarged femoral artery, a highly unusual character that is absent in the Tyrannidae *sensu stricto*, but present in *Pachyramphus*, the "*Schiffornis* group", all piprids and most cotingids. Thus, the tityras do seem to belong within a group of tyrannoid genera that "float" in an intermediate, presumably basal systematic position outside any of the three narrowly defined families Tyrannidae, Pipridae and Cotingidae.

One may assume that, at the time of the separation of South America from Africa and Antarctica, early in the Tertiary, the principal passerine elements were ancestors of the present nonoscine families. Today, these families make up about 60% of the perching-bird fauna of South America. Early in the evolutionary history, the ancestral suboscines gave rise to two major independent radiations within the varied habitats of the Neotropics, especially in the great tropical forests. One lineage was to evolve into the complex of families now often classified as the Furnarioidea, or, as in the present work, the suborder Furnarii, which, in turn, is divided into two ecologically and morphologically distinct radiations: the first of these consists of the ovenbirds (Furnariidae) and the woodcreepers (Dendrocolaptidae), totalling 288 species; and the second comprises the two antbird families, Thamnophilidae and Formicariidae, the gnateaters (Conopophagidae) and the tapaculos (Rhinocryptidae), with a combined total of 335 species. This huge suboscine radiation is made up largely of foliage-gleaning insectivores that gather food by actively searching through vegetation and perch-gleaning, probing, tearing, and making short-distance sallies for relatively large prey.

The second major suboscine lineage to radiate during the Tertiary was the group that is usually referred to today as the Tyrannoidea, or, as herein, the suborder Tyranni, consisting of the modern Pipridae and Cotingidae, together containing 129 species, mostly specialized frugivores, and the huge family of Tyrannidae, which currently comprises 429 species, including its peripheral relatives. The Tyrannidae probably evolved from a generalized, partially frugivorous forest bird resembling today's tyrant-like manakins of the genera *Piprites*, *Schiffornis*, *Neopelma* and *Tyranneutes*. Many tyrant-flycatchers also include fruit in the diet, but the family achieved its success by expanding into the sallying-insectivore niche unoccupied by the Furnarii. Thus, flycatchers could spread into virtually all habitats that contained both insects and places in which to sit and search for them. The tyrannid search-and-sally foraging style was suited to well-illuminated forest edges more than to the forest interior. As a result, tyrannids today dominate in scrublands, forest canopies, forest clearings and lake and river margins far more than in the dark interior of the forest, where the Furnarii prevail. Despite a predisposition towards open habitats, however, the Tyrannidae did also succeed as forest-dwelling birds. Indeed, the family's species diversity reaches its global peak in the tropical forests of Amazonia and the Guianas, the coastal forests of south-eastern Brazil, and the subtropical forests of eastern Ecuador and Peru.

The suboscines obviously locked up most of the possible niches for avian insectivores and frugivores, and in the modern Neotropics they continue to co-exist in spectacular diversity. The major suboscine families have each a slightly different ecological focus with regard to foraging modes and food habits. All families established areas of peak diversity in the lowland rainforests,



*The **Pied Water-tyrant** is a conspicuous and easily identified species that spends much of its time on floating vegetation foraging for insects. In this instance, it has caught an aquatic insect from the water's surface and carried it to the nearest convenient perch, the raised bud of a lily flower. Unlike marsh-tyrants* (Arundinicola), *water-tyrants rarely sally into open airspace, instead usually nabbing their prey during quick sallies or darting runs. They also differ from marsh-tyrants in being sexually monomorphic, with both sexes sharing the same harlequin black-and-white pattern. Females incubate their eggs within a messy, globe-shaped nest in which she is entirely concealed. This species is a familiar sight in the low-lying hinterland of the Orinoco River in Venezuela, where individuals can be seen at most wetlands foraging amongst the herons and ibises.*

[*Fluvicola pica*, River Irakomkapi, Amana Natural Reserve, French Guiana. Photo: Thierry Montford/ Bios]

and only two of them, Furnariidae and Tyrannidae, successfully invaded the open habitats south of Amazonia and above the tree-line, exploitation of the latter being possible only after the relatively late rising of the Andes. Once South America and North America were connected, late in the Tertiary, oscine birds invading from the north could radiate widely in the Neotropics, either as fruit-eaters or as seed-eaters; as examples, the region now holds over 180 species of tanager, and 190 finches, buntings (Emberizidae) and grosbeaks (Cardinalidae). At the same time, the insectivorous families were, in contrast, limited by competition from the great suboscine radiations already present; South America has only 33 parulid warblers, 21 vireos, 57 New World blackbirds, 38 wrens, and 28 thrushes.

Morphological Aspects

Given the numerical dominance and ecological diversity of the Tyrannidae throughout the New World, it is not surprising that the family contains a wide assortment of morphological variations. A few specializations in the feathers of the wing, tail or crown are associated with social display, but the vast majority of the differences in body size, bill size and form, wing length and shape, tail structure, and leg and foot size are associated with different behavioural adaptations for foraging throughout the complete range of habitats of two continents. A detailed evaluation of the relationship between foraging mode and body form across the Tyrannidae, conducted by J. W. Fitzpatrick, provides background data for the observations summarized below.

Tyrant-flycatchers range in body size from the world's smallest passerine bird, the Short-tailed Pygmy-tyrant of the Amazon forest, weighing no more than 5 g, to the Great Shrike-tyrant, a hook-billed predator of the high southern Andes with a weight of 100 g. The family as a whole exhibits about the same distribution of body sizes as that found within the entire order Passeriformes, with most species falling in the weight range 10-30 g. The smallest tyrannids are members of the pygmy-tyrant and tody-tyrant group, birds that forage in dense vegetation and leap or flit explosively upwards to snatch prey; some of these weigh 6-10 g and have a wing chord measuring 45-55 mm. In this same size class are several wren-like species, such as the *Pseudocolopteryx* doraditos and the *Polystictus* tachuris, that live in tall grass and reedbeds. Only slightly larger are numerous genera of warbler-like and gnatcatcher-like tyrannids in the subfamily Elaeniinae, most of which actively forage high in forest canopy, *Ornithion*, *Zimmerius* and *Phylloscartes* being typical examples. As body size increases, pace of movement through the vegetation or across the landscape becomes more deliberate. The large number of middle-sized tyrannids forage with variations on the search-and-sally technique within vegetation of medium to low density, or by alternately running and stopping on open ground (see Food and Feeding). Examples of the former are the elaeniine genera *Pogonotriccus* and *Leptopogon*, and *Empidonax*, *Contopus* and their relatives in the Fluvicolinae, while the fluvicoline *Lessonia* and *Muscisaxicola* are typical of the latter strategy.

Two groups have evolved the largest bodies, and both live predominantly in open woodland or non-forest habitats. One of these is the fluvicoline radiation of *pampas*-dwelling monjitas, *Myiotheretes* bush-tyrants of the Andean tree-line and shrike-tyrants of the Andean *puna* and Altiplano, all of which search patiently on slightly elevated perches, sometimes for minutes on end, before sallying down or pouncing on prey. This predatory technique also typifies the Great Kiskadee in the Tyranninae, but most members of this large-bodied subfamily sally into the air for flying prey or, as in the case of, for instance, *Myiarchus*, *Megarynchus* and *Myiodynastes*, against leaves for large arthropods and fruit.

Because the bill of a tyrant-flycatcher is its primary tool for securing food, variation in size and shape of the bill within the family corresponds tightly with foraging mode. The most common bill type is broad at the base and roughly triangular in shape when viewed from above, and has a pointed and very slightly hooked tip. Relatively long versions of this bill shape typify most aerial hawkers, such as the genera *Tyrannus*, *Contopus*, *Mitrephanes* and *Hirundinea*, while species that sally into the air or outwardly against leaf surfaces within open vegetation, such as *Myiobius*, *Myiophobus*, *Empidonax*, *Cnemotriccus* and *Myiodynastes*, have somewhat shorter, wider versions of the basic triangular bill. Among those tyrannids that practise hover-gleaning, frequently hovering at the moment of prey capture following a sally, the triangular bill is somewhat deeper and narrower or more elongated, with a well-developed hook. Examples of species possessing this type include the *Leptopogon* and *Myiarchus* flycatchers.

The breadth of the triangular bill is developed to extremes among the flycatcher groups that specialize in "upward strik-



As it forages in open country from an elevated perch, ***Say's Phoebe*** *is often seen perching on man-made structures, such as utility wires and fence posts. It launches hawking flights from these perches in pursuit of airborne insects, including bees, wasps, ants, flies, beetles and butterflies. It often sallies over ponds and streams, attracted to the abundance of insects around aquatic habitats. Like many tyrant-flycatchers, it is so swift and manoeuvrable that even dragonflies are at risk. More often than not, the successful phoebe returns to the same perch with prey safely grasped between the mandibles.*

[*Sayornis saya saya*, New Mexico, USA. Photo: B. R. Hughes/ Windrush]

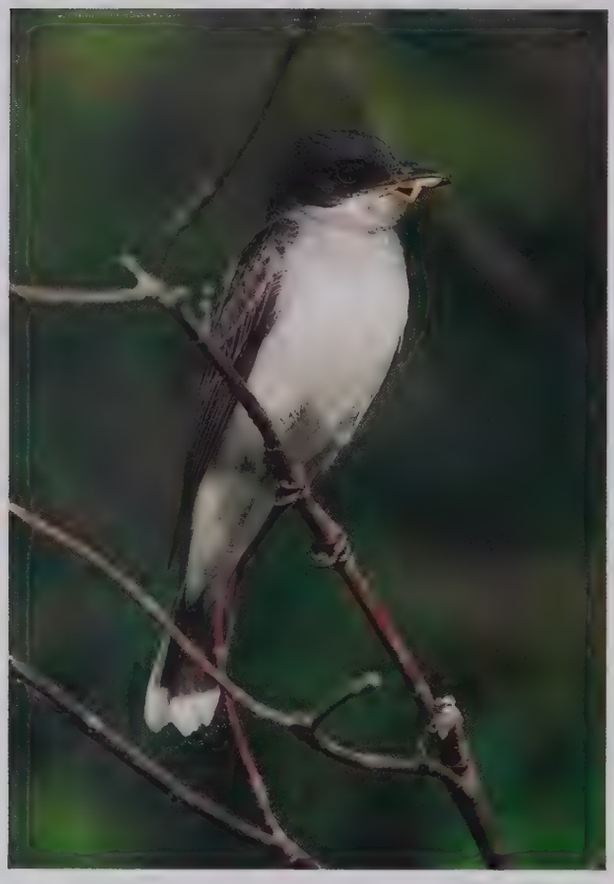


Manipulating large insects before swallowing them often involves beating the item against a branch, sometimes until the toughest body parts are broken, softened or removed. The prey item is then orientated lengthwise for easy swallowing. In tyrant-flycatchers the feet play no role in this process, and all manipulation is carried out using the bill. This ***Grey Kingbird*** *is dealing with a cicada, a robust homopteran with tough wings and carapace. This insect is so unwieldy that it cannot be swallowed backwards or sideways, and the kingbird needs to align it head first before attempting to swallow it.*

[*Tyrannus dominicensis dominicensis*, National Key Deer Refuge, Florida Keys, USA. Photos: Rob Curtis/ The Early Birder]

ing", in which the sallying bird flies upwards with a rapid burst to strike prey from an overhead substrate, usually the underside of a leaf, without hovering or pausing during the capture. Bills of upward strikers are all extremely broad farther out towards the tip, creating a spatula-shape with parallel edges, as in the *Todirostrum* tody-flycatchers, or a spade-shape in which the length of the bill is exceeded by its width, as in the *Platyrinchus* spadebills. In some cases, the bill is dorso-ventrally enlarged, often with a swollen-looking lower mandible, as exhibited by the flatbills in the genera *Rhynchocyclus* and *Tolmomyias*. Rictal bristles are quite pronounced among all these upward-striking species, and the extreme form both of the spatulate bill and of rictal-bristle development is found in *Onychorhynchus*, the Royal Flycatcher.

Contrasting with the broad bill of hawkers and strikers is the thin warbler-like bill of the perch-gleaners. These species have a bill shaped so as to act like tweezers, providing precision for picking prey items, often cryptic ones, from close range in hidden places. This bill shape is usually accompanied by little or no rictal-bristle development, as in the aptly named beardless tyrannulets and in the wren-like Many-coloured Rush-tyrant. A long, relatively thin bill is also a feature of larger-bodied, perch-



The larger tyrant-flycatchers are by no means restricted to insect prey. This ***Eastern Kingbird*** *is eating a tiny frog, and other kingbirds and relatives have been recorded consuming tadpoles, lizards, small snakes and even fish. The species that eat the largest prey, such as the genera* Attila *and* Agriornis, *tend to have a stronger hooks at the tip of the bill, this being used to prevent strong prey from escaping.*

[*Tyrannus tyrannus*, Dryden, New York, USA. Photo: Marie Read]

to-ground feeders such as the monjitas, which require the same kind of precision as the perch-gleaners as they pick prey from the surface of the ground or ground-cover vegetation after sallying down from above.

Tyrant-flycatchers that eat fruit most regularly, especially those that do so in all months of the year, have a short, slightly broadened bill somewhat convergent with those of the extensively frugivorous manakins. Examples include the Piratic Flycatcher and members of the related genus *Myiozetetes*, as well as most species of *Elaenia*. The rounded bill of the peculiar Sharp-tailed Tyrant may be associated with some degree of seed-eating in the species' grassland habitat (see Food and Feeding).

A few tyrannid genera regularly capture very large prey items, up to the size of small reptiles (see Food and Feeding). Irrespective of whether they snatch their prey from leafy vegetation in forests, as do the attilas, for example, or in open, temperate grasslands, as do the the shrike-tyrants, these species have a relatively long, strong bill with a well-developed hook at the tip.

The maxim that a jack-of-all-trades is a master of none can be applied to the shape of flycatcher bills. Species that use a variety of prey-capture techniques without specializing on any one have a bill that is of perfectly average dimensions when compared with the family as a whole. Perhaps the best example is the corvid-like bill of the Great Kiskadee.

Rictal bristles are very well developed in most tyrant-flycatcher groups, especially among those that sally hard into vegetation to snatch their prey. Proportionally the longest, most delicately curved bristles are those of the genera *Onychorhynchus*, *Myiobius* and *Terenotriccus*, a group with uncertain affinities but possibly monophyletic (see Systematics). Densely clustered, stiff bristles protrude around the face, eyes and bill of all species in the genus *Attila*, and of several of the larger *Agriornis* shrike-tyrants, including the related Chocolate-vented Tyrant (*Neoxolmis rufiventris*). This unusual condition presumably provides protection for the eyes against the flapping wings, sharply barbed legs or claws and noxious hairs of the very large food items taken by these predatory species. Indeed, in the case of the Willow Flycatcher, a sally-gleaning *Empidonax*, rictal bristles have been shown experimentally to reduce the contact between foreign objects and the eyeball. The tyrannids with the least developed rictal bristles are those that do little sallying but, instead, gather food by perch-gleaning in the manner of warblers. They include, among others, the genera *Camptostoma*, *Phyllomyias*, *Zimmerius* and *Inezia*.

Wing shape, as well as the ratio of body mass to wing area (wing-loading), varies considerably within the Tyrannidae. As with bill shape, this variation has been shown to correlate closely with foraging mode, but migratory behaviour adds a further, independent correlate. Short, rounded and highly cambered wings with high wing-loading are typical of birds that rarely or never engage in sustained flight but routinely require short, quick bursts of flight from the ground or a perch, as is typical of, for example, quails (Odontophoridae, Phasianidae) and grouse (Tetraonidae).



Many tyrant-flycatchers eat fruit, and a few are obligate frugivores. The ***Social Flycatcher*** *eats insects, but spends much of its time consuming berries. This is one of the most abundant and widespread birds in South America, almost constantly in sight or earshot in most humid lowland regions where open country or forest edge exists. This individual has been foraging on mistletoe (Loranthaceae) berries, which are large enough to be worth carrying away from the host plant, and which contain sticky seeds that adhere to a branch when regurgitated by the bird. This is a dispersal adaptation specifically aimed at frugivorous birds.*

[*Myiozetetes similis*, São Paulo, Brazil. Photo: Edson Endrigo]



*The **Great Kiskadee** is the supreme ecological generalist of the family. An opportunistic omnivore, it occupies a massive spectrum of foraging niches from downtown utility wires to the shores of ox-bow lakes in pristine Amazonian wilderness, from southern Texas to northern Patagonia. Its raucous and distinctive voice is one of the familiar sounds of the Neotropics. Adults visit ripe palm fruit, as shown here, but they also catch beetles, millipedes and reptiles. They will consume nestlings, carrion and municipal waste, and in parts of their range they forage in the style of kingfishers, plunging from a low perch to pluck a small fish or tadpole from water. Returning to the perch, the kiskadees then beat their prey senseless until it can be swallowed. One individual was seen to batter a 5 cm cichlid fish for over 13 minutes.*

[*Pitangus sulphuratus guatimalensis*, San José, Costa Rica. Photo: Marco Saborío]



*The **Ash-throated Flycatcher** in this photograph may have just quenched its thirst with a billful of water from a shrinking puddle, or, alternatively, it might just be poised to attack prey along the water's edge. It has been hypothesized, though not yet proven experimentally, that flycatcher species such as this, which live in arid habitats, consume all the necessary moisture through their diet of insects and fruit, as is the case with several other bird groups.*

[*Myiarchus cinerascens cinerascens*, south Texas, USA. Photo: Joe McDonald/DRK]



*The **Fork-tailed Flycatcher** occurs in large, harmonious flocks during the non-breeding and migration periods, but on their breeding grounds they are much less social and much more aggressive. They often chase rivals or prospective partners from perch to perch, as seen here, and males perform dramatic aerial displays. During such a display, the male flies upwards at an angle until he stalls, then he parachutes down in a spiral with wings held out and tail fanned, before regaining height once again. The remarkable outer tail feathers, elongated like old-fashioned shear-blades, no doubt assist in executing these spiral displays.*

[*Tyrannus savana savana*, Depresión del Salado, Buenos Aires, Argentina. Photo: Yves Bilat]

In the Tyrannidae, this lifestyle typifies the pygmy-tyrants, the tody-tyrants and the tody-flycatchers, as these species habitually sally upwards to snatch prey from the undersurfaces of leaves and, while foraging, make only short-distance movements between perches. All of these species, of which the Scale-crested Pygmy-tyrant (*Lophotriccus pileatus*) and the Common Tody-flycatcher are good examples, live in very small, permanent territories throughout the year and do not migrate. Possessing some of the smallest and most rounded wings in the avian world, these 52 species have the most limited dispersal ability of any group in the Tyrannidae. As a consequence, most of them have comparatively small ranges and exhibit pronounced local intraspecific differentiation, and many species groups show evidence of relictual distribution patterns, as is the case with, for example, the Buff-breasted, Cinnamon-breasted and Kaempfer's Tody-tyrants in the genus *Hemitriccus*.

At the other end of the spectrum in wing shape are the aerial-hawking specialists, for which rapid, sustained flight in the open air is essential for successful pursuit of fast-flying insects. Extreme examples occur in both the Fluvicolinae and the Tyranninae. Although no tyrant-flycatcher practises the "screening" foraging mode typical of swifts (Apodidae) and swallows, the generic name of the Cliff Flycatcher, *Hirundinea*, accurately implies that this species comes the closest, *Hirundo* being a well-known genus of swallows. Cliff Flycatchers are highly specialized aerial salliers, with tiny legs and feet and proportionally the longest wings in the Tyrannidae. As its English name implies, this species occurs almost exclusively in areas with high, exposed cliff faces, from which it sallies out as far as 100 m to snatch large flying insects. On occasion, it pursues these in protracted, acrobatic flight, and at such times, with its long, pointed wings and forked tail, it does resemble a swallow in both behaviour and form.

Proportionally long and pointed wings, with low wing-loading, also characterize the *Contopus* assemblage of pewees, which includes many species that engage in stereotyped aerial hawking from exposed perches and also migrate. The largest, longest-winged pewee is the Olive-sided Flycatcher, which moves between breeding grounds in the spruce bogs and high-elevation forests of northern North America and non-breeding quarters in the moist, forested slopes of the South American Andes. In both places, and along the way in between, this species characteristically perches atop the highest, most exposed treetop or snag, from which it launches upwards or outwards for up to 100 m to snap large flying insects. In mid-elevation montane forests of Central and South America, Olive-sided Flycatchers often share habitat with several smaller members of the genus *Contopus*, and with two allopatric species in the closely related genus *Mitrephanes*. These latter two, the Tufted Flycatcher and the Olive Flycatcher (*Mitrephanes olivaceus*), are, in effect, miniature pewees, with which they share both the aerial-hawking foraging mode and the unusually long and pointed wingtips.

The variously notched outer primaries of the kingbirds may have evolved from aerodynamic "slotting" of the wingtips, a feature typical of many groups of strong-flying birds. Among the 13 kingbird species, the most sedentary ones, such as the Loggerhead Kingbird (*Tyrannus caudifasciatus*), have normal-shaped primaries that lack notches altogether. Sharply attenuated outer primaries occur in some of the most migratory forms, such as the Scissor-tailed Flycatcher and the Western Kingbird (*Tyrannus verticalis*). Several species have deep notches in the outer two, five or six primaries, and the four subspecies of the Fork-tailed Flycatcher differ quite markedly from one another in the pattern of notching. In virtually all these cases, the notches are much more pronounced among males than among females, suggesting that they play either an aerodynamic or a sound-producing role in the males' fluttering aerial courtship displays (see Breeding).

A recurring feature in the wing design of many tyrant-flycatchers is that of oddly shaped flight-feathers within an otherwise structurally normal-looking wing. The affected feathers may be narrow and blade-shaped, narrow and pointed, reduced to half their normal length, slightly to deeply notched at the tip, notched subterminally on the inner webs, truncated at the tip, or even twisted. For the most part, these modifications are near the tip of the wing, in the outer primaries, and they are very often, although not always, confined to males. In the black-tyrant genus *Knipolegus*, most species have normal wings, but males of Hudson's Black-tyrant (*Knipolegus hudsoni*) and of the Amazonian Black-tyrant have three narrowed outer primaries, while males of the Cinereous Tyrant (*Knipolegus striaticeps*) have all ten primaries modified. Several other species possess single-feather modifications, as with the ninth primary of the Cock-tailed Tyrant (*Alectrurus tricolor*) and the tenth primary of the Black-and-white Monjita (*Xolmis dominicanus*). Modified inner primaries, with normal outer ones, are present in the genus *Mionectes*. The most extreme feather reduction, however, occurs in males of the monotypic genus *Atalotriccus*, the Pale-eyed Pygmy-tyrant, the



*The name "**Social Flycatcher**" is something of an exaggeration, as the species lives in pairs or small family parties, rather than flocks, and quickly repels intruders to its local territory. "Antisocial Flycatcher" might have been more accurate, especially given the racket it often makes from dawn till dusk around rural dwellings! At intervals throughout the day, pair members break into an unmusical and uncoordinated mutual calling, often accompanied by a frantic flapping of wings as shown here. These duets, which occur in a number of different tyrant-flyatcher groups, appear to serve both as a territorial signal and for strengthening the pair-bond.*

[*Myiozetetes similis*, São Paulo, Brazil. Photo: Edson Endrigo]

four outer primaries of which are so greatly reduced that they barely resemble flight-feathers at all; this species makes a peculiar, insect-like buzz with its vibrating wings. The Crested Doradito (*Pseudocolopteryx sclateri*) has two similarly reduced inner primaries, P6 and P7 being shortened and pointed, and micro-structural modifications of the barbules on primaries P6-P9, and this is a rare case in which the structural modifications of the flight-feathers have been shown to be associated with a wing-buzzing and popping sound that plays a role in the advertising song (see Voice). In the Brownish Twistwing, the basal portion of the primary shaft is uniquely stiffened, causing the distal portion to curve upwards and outwards, in addition to which the outer portion of the webbing flares upwards, owing to a weakening in the barbs. The function of this peculiar configuration remains unresolved, but it evidently plays a role in the mechanical-sounding display performed by the males. Clearly, there is much still to be learned about both the mechanical function and the biological significance of all these flight-feather modifications. High-speed videography will no doubt be required in order to resolve these mysteries.

Tail length varies more or less uniformly with body size within the Tyrannidae, but tail shape does differ somewhat according to foraging mode. The most deeply forked tail characterizes the aerial hawkers, such as members of the genera *Tyrannus*, *Contopus*, *Mitrephanes*, *Pyrrhomyias* and *Hirundinea*, as elongated outer rectrices assist the bird in making sharp turns and aerial manoeuvres in the open air. The most extreme versions, in which the outer rectrices may be three times longer than the wing chord, have evolved independently at least four times in species that forage mainly with aerial manoeuvres: twice in the genus *Tyrannus*, involving the Scissor-tailed Flycatcher and the Fork-tailed Flycatcher, and on separate occasions in two monotypic fluvicoline genera represented by the Streamer-tailed Tyrant and the Shear-tailed Grey Tyrant. In at least the first three cases, the exaggerated tail is used actively in courtship display (see Breeding), as well as during aerial sallies. A surprising additional example of the forked tail is provided by the little-known Fork-tailed Pygmy-tyrant, but its function is completely unknown, as this is a small, upward-striking *Hemitriccus* species that forages in dense vegetation. Finally, the greatly elongated, blade-shaped central rectrices of the Long-tailed Tyrant, similarly unmatched by any other member of the family, are unusual for any passerine bird. This is an obligate aerial-hawking flycatcher, but neither the central position of its elongated rectrices nor the relatively weak structure of these specialized feathers is consistent with an aerodynamic function. They trail behind the sallying bird more as a streamer than as a pair of "rudders", and they are highly variable in length from one individual to another. As females have shorter streamers than males, it appears that these elongated rectrices are utilized in advertisement, rather than as mechanical aids during foraging.

The peculiarly tiny tail exhibited by several genera appears to be virtually vestigial. Members of the genus *Myiornis*, especially the superspecies formed by the Black-capped and Short-tailed Pygmy-tyrants, accomplish foraging manoeuvres by means of a peculiar flight that approaches hovering, in which the tail plays no aerodynamic role. The appropriately named Short-tailed Field-tyrant, in the monotypic genus *Muscigralla*, has a very short tail and is exclusively terrestrial. It forages by alternately running and standing in an upright posture, and in behaviour and morphology it is typical more of a shorebird than of a flycatcher.

What must be the oddest tail structures in the family belong to the two species in the genus *Alectrurus*. The explorer W. H. Hudson described that of the Cock-tailed Tyrant in the following words: "the two outer tail-feathers have remarkably stout shafts, with broad coarse webs, and look like stumps of two large feathers originally intended for a bigger bird, and finally cut off near their base and given to a very small one". These feathers are often held cocked at a sharp angle, resembling the tail of a miniature rooster, hence the English name for this species. In the other member of this genus, the Strange-tailed Tyrant, the outer tail feathers of the male, and to a lesser extent those of the female, are greatly elongated but, in contrast to the Shear-tailed Grey and Streamer-tailed Tyrants, not in an aerodynamically strengthening fashion. Instead, the greatly elongated shaft is bare at the base and carries a terminal pennant. In both cases, the peculiar tail is employed in elaborate aerial displays by the black-and-white males, as the cryptically brown females remain barely visible within the grass or reeds below. The extreme sexual selection evident in these two grassland species makes it virtually certain that they have a polygynous social system (see Breeding).

Among the tyrant-flycatchers, the Sharp-tailed Tyrant is unique in having only ten rectrices, each of which is stiffened and bears degenerated barbs. This tiny elaeniine lives exclusively in open grassland, where it perches on grass stems and small

shrubs. The tail is held vertically downwards and often in contact with the grass stalk below the perched bird, suggesting that its stiffness perhaps serves a bracing function.

Tarsus length and the size and strength of the foot correlate extremely closely with foraging mode. The longest legs in proportion to body size belong to those species that forage predominantly on the ground or regularly fly to the ground from an elevated perch. This ecomorphological condition has arisen a number of times independently across the family, as demonstrated by, among others, the genera *Corythopis*, *Machetornis*, *Muscigralla* and *Muscisaxicola*. The most powerful legs and feet are those of the monjitas, the bush-tyrants in the four genera *Myiotheretes*, *Cnemarchus*, *Polioxolmis* and *Neoxolmis*, and the *Agriornis* shrike-tyrants, all of which are predatory perch-to-ground specialists. The Galapagos Flycatcher, a *Myiarchus* species, illustrates the selective pressure for increased tarsus length with increasing use of the ground. Its proportionally long legs and its tendency to sally to the ground both stand out within an otherwise morphologically and behaviourally uniform genus. Other examples include the Torrent Tyrannulet and the three phoebes. Two tyrannids, the Austral Negrito (*Lessonia rufa*) and the Strange-tailed Tyrant, have extraordinarily long hind claws, closely resembling those of certain Old World pipits and longclaws of the family Motacillidae. The mechanical function of these claws is not known conclusively, but they presumably provide considerable extra support for walking on mats of wet or floating vegetation, as these two groups regularly do.

Long, slender legs and toes are associated with the habit of frequently using vertical or near-vertical perches, and represent a morphological convergence with the wrens. Examples include the two wagtail-tyrants in the genus *Stigmatura*, the *Todirostrum* tody-flycatchers, the two tachuris in *Polystictus*, and the Many-coloured Rush-tyrant. Short, slender legs and rather weak feet are typical of the aerial hawkers, and once again the Cliff Flycatcher, the Cinnamon Flycatcher and the pewees present the most extreme examples.

Habitat

Tyrant-flycatchers are found in every terrestrial habitat in the New World with the exception of the high-Arctic tundra. They occur as far north as the stunted black spruce bogs near the Arctic Circle, and as far south as the rocky, treeless terrain of Tierra del Fuego. The enormous evolutionary success of the Tyrannidae is at least in part a consequence of the myriad adaptive variations that its species have made from the "search and sally" foraging style typical of the family as a whole. This hunting strategy gives access not only to aerial prey, but also to prey substrates that include the ground as well as leafy vegetation, and makes the undersides of leaves just as accessible as their upper surfaces. Thus, whether the habitat is rainforest, deciduous woodland, coniferous woods, arid scrub, sagebrush (*Artemisia*) or cactus desert, open *campo*, or mountaintop grassland, tyrant-flycatchers have adapted their foraging styles to enable them to gain access to whatever arthropod and small-fruit resources these habitats provide.

Across the Neotropics, tyrant-flycatchers are especially diverse within micro-habitats where light intensity is highest, and they dominate the "outer edges" of resource-rich habitats such as forest canopy, forest edge, scrub and second growth. In contrast to the Tyrannidae, the other two major Neotropical radiations of suboscine insectivores, the formicariids and thamnophilids, and the furnariids and dendrocolaptids, predominate in forest understorey, dense thickets, vine tangles and leaf litter, where foliage density is higher, light intensity is lower, and prey are best located and captured by probing, picking or pouncing.

Tyrannid diversity is proportionally highest in desert and scrub habitats of western North America, Middle America and tropical South America, where the total avian species diversity is low. Flycatchers can comprise up to half of the passerine avifauna in the most arid, species-poor lowland deserts. Across the desert scrubs of northern Venezuela, for example, where the most barren landscapes have just a few widely scattered, knee-high shrubs and low cacti, four of the ten resident passerines are tyrant-flycatchers; these are the Southern Beardless Tyrannulet (*Camptostoma obsoletum*), the Northern Scrub-flycatcher (*Sublegatus arenarum*), the Brown-crested Flycatcher and the Vermilion Flycatcher. As soil moisture and density of scrub vegetation increase within this region, the flycatcher community steadily becomes more diverse as species are added in quite predictable sequence. First to join are the tiny Slender-billed Tyrannulet, the Mouse-coloured Tyrannulet, the Pearly-vented Tody-tyrant (*Hemitriccus margaritaceiventer*), the Cattle Tyrant and the Great Kiskadee. Where scattered taller *Acacia* bushes and small trees appear in the arroyos, they are colonized by further species, including the Maracaibo Tody-flycatcher, the Pale-eyed Pygmy-tyrant, the Fuscous Flycatcher and the Tropical Kingbird. Where arroyo vegetation becomes tall and dense, still others are added to the tyrannid community with the appearance of the Pale-tipped Tyrannulet, the Yellow-breasted Flycatcher, and the Bran-coloured and Dusky-capped Flycatchers. Finally, in areas where scrub vegetation is tall and dense with an overstorey of deciduous trees, as many as ten additional tyrannids join the passerine community, which now includes the White-throated Spadebill (*Platyrinchus mystaceus*), the Olivaceous Flatbill (*Rhynchocyclus olivaceus*), the Bright-rumped Attila, several elaenias, and a number of large tyrannines such as the Streaked Flycatcher. In these semi-deciduous woodlands, tyrant-flycatchers comprise about 25% of the total passerine community.

High in the Andes, in the arid Altiplano, the *puna* and *páramo* zones, and rocky cliffs above the tree-line, the tyrannids are represented only by the *Muscisaxicola* ground-tyrants, a few bush-tyrants and shrike-tyrants. The high-Andean *Polypepis* woodlands also occasionally harbour tit-tyrants, and the rare and globally threatened Ash-breasted Tit-tyrant (*Anairetes alpinus*) is restricted to a few patches of this most distinctive, highly endangered habitat at elevations above 4000 m (see Status and Conservation).

At slightly lower elevations, in the shrubby interface where composites, *Lupinus*, *Berberis* and other low shrubs interlace with tussock grasses and elfin forest on the humid Andean slopes, the tyrant-flycatcher community quickly diversifies. Here, several species of warbler-like *Mecocerculus* tyrannulets, high-elevation elaenias such as the White-crested (*Elaenia albiceps*) and Sierran Elaenias (*Elaenia pallatangae*), up to four species of *Ochthoeca* chat-tyrants and up to four *Myiotheretes* bush-tyrants, the beau-



Displays of tyrant-flycatchers often contain useful taxonomic information, as was recently shown by studies of the Suiriri Flycatcher (Suiriri affinis). *It has long been known that pairs of this species sometimes perch side-by-side to give a duet, accompanied by a raising and flapping of the wings, and a spreading of the tail. Only very recently, however, was it noticed that some pairs performed these displays and others did not. This intriguing discovery, and the intensive field research that ensued, led to the description of a new species: the* ***Chapada Flycatcher***.

[*Suiriri islerorum*, Das Emas National Park, Goiás, Brazil. Photo: Johannes Ferdinand]

tiful Ochraceous-breasted Flycatcher, and even a high-elevation tody-tyrant, the Black-throated Tody-tyrant (*Hemitriccus granadensis*), can occur together.

The mid-montane cloudforests of the eastern Andes support mainly small-bodied flycatchers, with a number of genera represented by "elevational series" in which species replace one another up the elevational gradient. In southern Peru, for example, the genus *Myiophobus* is represented at low elevations of 250-1450 m by the Bran-coloured Flycatcher, and in lower cloudforest at 1000-2150 m by the little-known Unadorned Flycatcher (*Myiophobus inornatus*). Above these, the Handsome Flycatcher (*Myiophobus pulcher*) is found in full cloudforest at 1500-2600 m, and, highest of all, the Ochraceous-breasted Flycatcher lives at 2200-3400 m in upper cloudforest and elfin forest. The genera *Phyllomyias* and *Zimmerius* of small, perch-gleaning, treetop tyrannulets together contain a similar series of elevational replacements across the same gradient: the Slender-footed Tyrannulet (*Zimmerius gracilipes*) occupies tropical elevations, the Red-billed and Rough-legged Tyrannulets occur from 500 m to 1500 m, the Bolivian (*Zimmerius bolivianus*) and Ashy-headed Tyrannulets (*Phyllomyias cinereiceps*) live in the middle cloudforest zone at 1200-2000 m, and the Tawny-rumped Tyrannulet (*Phyllomyias uropygialis*) occupies the upper cloudforest zone at altitudes of 1800-3000 m. The Bronze-olive Pygmy-tyrant (*Pseudotriccus pelzelni*) lives in dense understorey thickets of lower cloudforest, and is replaced in similar habitats above 1800 m by the spectacular little Rufous-headed Pygmy-tyrant (*Pseudotriccus ruficeps*). Throughout the eastern Andes, the Slaty-capped Flycatcher (*Leptopogon superciliaris*) is a common tyrannid in mixed-species flocks at lower to medium-elevation cloudforest, and is abruptly replaced above 2000 m by the Inca Flycatcher (*Leptopogon taczanowskii*) in Peru, and by the Rufous-breasted Flycatcher (*Leptopogon rufipectus*) in Ecuador and Colombia. In contrast to these sequential elevational replacements, up to four species in the *Pogonotriccus* and *Phylloscartes* bristle-tyrant complex sometimes occur together in the humid upper tropical forests of the eastern Andes, at elevations of around 1000 m.

Peak diversities among tyrant-flycatcher communities occur at elevations below 1000 m in South America. In the Amazonian lowlands, more than 80 flycatcher species can be found at a single locality. Such staggering diversity occurs where a variety of resource-rich habitats come together, including floodplain-forest and *terra firme* forest, river edges, beaches and early-successional *Tessaria* thickets, canebrakes, *Heliconia* swamps, oxbow lakes, grassy marshes, bamboo stands, and *Mauritia* palm swamps. Tyrannid communities of the interior forest across the Amazon Basin can include up to 30 species, mainly in the 20 genera *Leptopogon*, *Mionectes*, *Elaenia*, *Myiopagis*, *Tyrannulus*, *Corythopis*, *Todirostrum*, *Myiornis*, *Hemitriccus*, *Myiobius*, *Onychorhynchus*, *Terenotriccus*, *Tolmomyias*, *Ramphotrigon*, *Attila*, *Rhytipterna*, *Sirystes*, *Myiarchus*, *Pachyramphus* and *Tityra*. Along river margins and Amazonian lakeshores, up to 15 species of large-bodied, omnivorous tyrannine flycatchers of ten different genera can occur together. These are augmented along brushy margins of rivers, accreting beaches and oxbow lakes by an additional 20 tyrant-flycatcher species representing a further 17 genera.

Ecological and geographical segregation is extremely finely developed within the tody-tyrants and pygmy-tyrants, a numerically rich assemblage of small-bodied species that are remarkably similar to one another in both morphology and behaviour. In south-eastern Peru, where avian diversity reaches its peak, nine different species in this lineage can be found within a single square kilometre, yet few of them are likely to see one another because each occurs in a different micro-habitat. Highest in the canopy of tall, even emergent trees is the Yellow-browed Tody-flycatcher (*Todirostrum chrysocrotaphum*). The Short-tailed Pygmy-tyrant inhabits the dense, viny edges of old blowdown openings midway up in tall forest canopy, while the White-eyed Tody-tyrant (*Hemitriccus zosterops*) forages in the darker mid-storey of the forest interior. Occupying seasonally flooded, leafy thickets at the river margins is the Spotted Tody-flycatcher (*Todirostrum maculatum*). Where the slow-moving rivers sweep around wide bends, dense stands of the tall cane *Gynerium sagittatum*, known locally as "*caña brava*", produce an impenetrable understorey habitat for the Rusty-fronted Tody-flycatcher (*Poecilotriccus latirostris*). In places where primary succession is further advanced, older cane stands become overshadowed by *Cecropia* trees, interspersed with *Heliconia*, and filled with dense, viny openings caused by the ravages of rainy-season floods. This productive and heterogeneous *matorral* zone is the habitat of



*The **Streamer-tailed Tyrant** is a distinctive species with a dark breastband, cinnamon wing panels, and an elongated tail. These features, and also its internal anatomy, have led to its placement in a monotypic genus of uncertain affinities within the Fluvicolinae. Pairs often engage in a magnificent display which might be to do with territorial signalling as much as with courtship and pair-bond maintenance. They perch together prominently, facing either in the same or directly opposite directions, and produce a volley of piercing whistles, warbles and bill-popping sounds. This vocal outpouring is accompanied by a raising and flapping of the wings and a rhythmical raising and fanning of the tail.*

[*Gubernetes yetapa*, Serra da Canastra, Minas Gerais, Brazil. Photo: Edson Endrigo]



Most species in the genus Knipolegus *engage in a spectacular back-flipping display initiated from an open branch. Here performed by a* ***White-winged Black-tyrant****, it begins with a quick vertical flight, usually 1-3 m in height, at the summit of which the male stalls upright, with his head at the top, his tail pointing vertically downwards and his feet held out. Then he topples over with half-closed wings (as seen in the right-hand photo) and drops back down, opening his wings just before he reaches the perch. He executes this charming performance every half-minute or so, usually producing a small grating "*erk*" note during the flight.*

[*Knipolegus aterrimus aterrimus*, Talampaya National Park, La Rioja, Argentina. Photos: José & Adriana Calo]

Johannes's Pygmy-tyrant (*Hemitriccus iohannis*). Finally, no fewer than three species of pygmy-tyrant, in three different genera, occupy different types and sizes of *Guadua* bamboo stands. These are the Flammulated Pygmy-tyrant (*Hemitriccus flammulatus*), which occurs in large, pure stands of dense bamboo; the White-cheeked Tody-tyrant, found in taller, older stands; and the Long-crested Pygmy-tyrant (*Lophotriccus eulophotes*), which appears to occupy transitional habitats that include both bamboo and leafy thickets, sometimes occurring in river-edge forest lacking bamboo altogether.

Tyrant-flycatchers are well represented among the many bird species that have become ecological specialists in *Guadua* bamboo thickets of the southern Amazon and in south-eastern Brazil. Besides the two bamboo-restricted species just mentioned, the Yellow Tyrannulet and the Large-headed Flatbill occur mainly in bamboo over much of their Amazonian ranges, while in south-eastern Brazil the Brown-breasted (*Hemitriccus obsoletus*) and Drab-breasted Pygmy-tyrants (*Hemitriccus diops*) are found largely in bamboo thickets. Similarly, in the eastern Andes, two distinctive *Anairetes* species, the Agile and Unstreaked Tit-tyrants, are found mainly in association with *Chusquea* bamboo stands high in the cloudforest.

Two of the five species of *Serpophaga* have specialized in living at the edges of streams and small rivers. One of these, the Torrent Tyrannulet, occurs in the middle and lower elevations of the Andes along rocky streams, where it flits actively from the tops of rocks to snatch both flying and stationary prey at the edges of fast-flowing water. The other, the Sooty Tyrannulet (*Serpophaga nigricans*), lives along the brushy edges of slower-moving streams and the edges of ponds in southern Brazil and northern Argentina. The Drab Water-tyrant, a widespread flycatcher of the Amazon Basin, is restricted to debris-covered and rubble-strewn banks of larger, seasonally flooding rivers where clay or mud banks are exposed. The Riverside Tyrant and the Lesser Wagtail-tyrant (*Stigmatura napensis*) occur along the Amazon itself and, in the former case, also the Orinoco River, where they are confined to regularly flooded, early-successional vegetation along the larger river islands. Like the Riverside Tyrant, the congeneric Amazonian Black-tyrant is similarly restricted to Amazonian and Orinoco river-edge habitats, but it forages deeper in the recesses of seasonally flooded forest and often sallies to the water's surface.

A handful of tyrant-flycatchers have specialized on open grassland and marsh habitats, and many of these represent some of the most unusual species in the family. The monotypic Sharp-tailed Tyrant is restricted to the few areas where large expanses of dry *campo* grassland still exist in central Brazil, eastern Bolivia, eastern Paraguay and northern Argentina. It shares these open grassland habitats with another peculiar tyrannid, the Cock-tailed Tyrant. Both species are becoming increasingly rare as agricultural conversion continues throughout their native habitats (see Status and Conservation). The beautiful Many-coloured Rush-tyrant is widely but locally distributed in southern South America, occurring in both coastal and temperate-zone marshes from Andean Peru southwards through Argentina and Chile, and in marshy lowlands from southern Brazil to Patagonia. Another southern species, the Spectacled Tyrant, breeds in Patagonian marshes and reedbeds, and feeds in adjacent open flats and floating vegetation; during migration and winter, it occurs irregularly in similar habitats high in the Andes of Chile, Argentina, Bolivia and Peru. The four doraditos in the genus *Pseudocolopteryx* and the two tachuris in *Polystictus* are locally distributed in wet grass habitats, mainly in southern South America.

The open *Prosopis* scrub and woodland of Mexico and the south-western USA, on the one hand, and those of central Argentina, on the other, harbour ecologically similar but taxonomically very different passerine communities. Tyrannid diversity is low in the Mexican arid scrublands, although up to four species in the genus *Myiarchus* may be found together, these being the Ash-throated, Brown-crested, Nutting's (*Myiarchus nuttingi*) and Dusky-capped Flycatchers. In the Argentine *monte* deserts, this scrub habitat holds a disproportionately high number of Tyrannidae, with several monjitas, and tyrannines such as the Fork-tailed Flycatcher and Crowned Slaty Flycatcher, along with the Vermilion Flycatcher and a number of arboreal perch-gleaners, including the Greater Wagtail-tyrant (*Stigmatura budytoides*). In this distinctive habitat, the dense, deciduous chanar tree (*Geoffroea decorticans*) provides nest-sites for many of the



*This male **Black-crowned Tityra** is carrying a leaf, probably intended as nesting material. Tityras do not build nests as such, but they do line the floor of natural cavities with scraps of vegetation, bark and dead leaves. In most tyrant-flycatchers the female takes sole responsibility for nest building and incubation, although often the male looks on with interest throughout the process. It is not uncommon, however, for males to bring supplementary nest material or food for the female during the incubation period.*

[*Tityra inquisitor inquisitor*, Iguazú National Park, Misiones, Argentina. Photo: Julián M. Alonso]

tyrannids. As an example, 98% of the nests of White-bellied Tyrannulets (*Serpophaga munda*) found in various studies were in chanar trees.

Many savanna-inhabiting flycatcher species have discontinuous ranges in South America, occurring both in the *llanos* and grasslands of the Guianan Shield and in the larger stretch of open country stretching from north-eastern Brazil south-westwards to the Argentine *pampas*. A few of these widespread open-country tyrannids are austral migrants in the southern portion of their range or are highly migratory and move great distances, the Cattle Tyrant and the Fork-tailed Flycatcher being two respective examples, and such movements help to explain their occurrence on both sides of the vast Amazon forest. Other open-country tyrannids, however, are sedentary and not known to migrate at all, the Tawny-crowned Pygmy-tyrant being a typical example. The distributions of these are presumed to reflect large-scale historical changes in the vegetation of South America, as may have occurred, for instance, during global cool spells (glacial maxima). During such dry periods, savanna habitats are thought to have penetrated, and possibly severed, the Amazonian forest, thereby allowing grassland birds such as the Bearded Tachuri (*Polystictus pectoralis*) to disperse across the South American lowlands. As climate changed and the forests returned, these specialized species became isolated in the discontinuous regions of open habitat that exist today.

Temperate grasslands of North America, the "Great Plains", support the largest radiation of kingbirds, although it is rare to find more than two species in any one spot. The widespread Eastern Kingbird (*Tyrannus tyrannus*) occupies the most mesic habitats, and even breeds along forested creeks and beside beaver (*Castor*) ponds, as well as in open grassland. The Western Kingbird is the common kingbird across the wide-open, northern Great Plains, while the very similar Cassin's Kingbird (*Tyrannus vociferans*) occurs in drier, more southerly prairie habitats where trees dot the landscape along creek beds. The Scissor-tailed Flycatcher is the kingbird of the southern Great Plains where open, shrubby grasslands prevail. Couch's Kingbird (*Tyrannus couchii*), virtually restricted to Mexico, inhabits the dry scrubland and scrubby savannas of eastern Mexico, extending north to the USA border.

A four-species assemblage of tyrant-flycatchers, representing four different genera, is ubiquitous across the deciduous forests of eastern North America, being joined in certain habitats by "extra" species of *Empidonax*. The core quartet consists of the Great Crested Flycatcher, hover-gleaning in the treetops, the Eastern Wood-pewee, practising aerial hawking in the open middle storey, the Eastern Phoebe (*Sayornis phoebe*), which feeds by aerial hawking and perch-to-ground gleaning near cliff faces and man-made structures, and the Least Flycatcher (*Empidonax minimus*), sally-gleaning in forest openings, edges and abandoned orchards. In addition, the Willow Flycatcher lives in open brush, second growth and riparian zones, and its northerly replacement, the Alder Flycatcher, breeds in alder (*Alnus*) swamps, while the



*As in most tyrant-flycatchers, the female **Grey-capped Flycatcher** is the only member of the pair to build the nest, while her mate watches from a nearby perch. This species builds an untidy ball of grasses with a side entrance, lodging the whole structure in a forked branch or cavity, usually in open situations and often over water. Very often, the female may steal nesting material from other active bird nests, and occasionally the pair will actually take over another bird's nest entirely, in the manner of their close relative the Piractic Flycatcher* (Legatus leucophaius).

[*Myiozetetes granadensis granadensis*, Cachí de Cartago, Tapantí National Park, Costa Rica. Photo: Marco Saborío]



*The **Common Tody-flycatcher** is a familiar bird of mature gardens, shrubland and patchy woodland in tropical Central and South America. Like all species in the tody-tyrant and pygmy-tyrant lineage, it builds a hanging pouch-shaped nest with a side entrance. This individual is putting the finishing touches to the long strap by which the pouch is attached to a twig. Typical characteristics of this species are that it incorporates random articles into the outer surface of its nest, and that it binds the structure together with spiders' webs. This technique tends to produce a messy effect, which presumably helps conceal the nest from predators. In this case, the camouflage is rather decorative as the bird has chosen to stitch some bright flowers into the walls of its home. Some members of the genus* Todirostrum, *including this species, have a strange display in which they hitch sideways along a perch with the wings drooped, and the tail cocked almost vertically over the head and waggled enthusiastically from side to side, all the while delivering a series of metallic "tic" sounds. Note the markedly rounded wings typical throughout the tody-tyrant and pygmy-tyrant lineage.*

[*Todirostrum cinereum wetmorei*, Panama. Photo: Marie Read]



The design of tyrant-flycatcher nests reveals evolutionary relationships and can help to resolve taxonomic issues. The ***Lesser Kiskadee*** *was traditionally placed in the genus* Pitangus, *but several unique features led to its reassignment to a monotypic genus,* Philohydor. *In addition to the substantial differences in syringeal structure and voice, the two kiskadees build very different nests.* Pitangus *builds an untidy spherical affair, while* Philohydor *builds an open cup often made of vine tendrils. This adult is in the process of nest construction, apparently making use of a spider's nest as a foundation. Many species of tyrant-flycatcher in most taxonomic groups encompass spider webs and spider egg sacs into their nest walls.*

[*Philohydor lictor lictor*, Alta Floresta, Mato Grosso, Brazil. Photo: Edson Endrigo]

Acadian Flycatcher (*Empidonax virescens*) occupies the dark interiors of southern hardwood forests and, in the north, ravines dominated by hemlock (*Tsuga*).

The vast coniferous-forest zone that stretches from coast to coast across North America supports only a few tyrannids. The Olive-sided Flycatcher occurs throughout and, in the west, extends southwards through the higher elevations of the Rocky Mountains and the Sierra Nevada. The Yellow-bellied Flycatcher (*Empidonax flaviventris*) breeds in eastern coniferous habitats, especially black spruce bogs, while Hammond's Flycatcher (*Empidonax hammondii*) is found throughout western spruce-fir habitats from northern Alaska south to the central Rockies. The latter's replacement in more open and mixed hardwood-conifer habitats is the Dusky Flycatcher (*Empidonax oberholseri*), and in the arid juniper (*Juniperus*) and sagebrush of the Great Basin its place is taken by the rare Grey Flycatcher.

Tyrant-flycatchers in a variety of groups benefit from habitat alterations associated with agriculture and grazing. Orchards and nurseries, for example, are home to Least Flycatchers in North America. Brushy second growth and overgrazed scrublands in the tropics support dozens of tyrannids, and have probably enabled such species as the Mouse-coloured Tyrannulet, the Tawny-crowned Pygmy-tyrant and the Fuscous Flycatcher to become more common today than they ever were in the past.

The Great Kiskadee has greatly expanded its geographical range, elevational tolerance and overall abundance across much of Central and South America, mainly as a consequence of forest clearance. This conspicuous tyrannid, likely originally to have been mainly a river-edge and lakeshore species, now occurs even in densely forested regions wherever man-made clearings of sufficient size exist. Besides using a variety of naturally open habitats and water margins, the kiskadee will forage in agricultural lands, along roadsides and hedgerows, and in suburban gardens and city parks, and it often nests in such areas, too. The Great Kiskadee is now common in a variety of suburban settings in Bermuda, where it was introduced in 1957. Similarly, the Common Tody-flycatcher is a regular inhabitant of ornamental shrubbery planted alongside houses, garden borders and plazas in the tropics.

Another tyrannid that is growing increasingly common as a commensal with man is the Cliff Flycatcher. This inhabitant of exposed cliff faces is now seen frequently around human habitations, even in some of the most bustling cities of South America, such as São Paulo, where it regularly perches and occasionally even nests on window or roof ledges, and frequently uses utility poles and wires as foraging posts.

General Habits

Because tyrant-flycatchers are so numerous and diverse, only a few general habits can be said to characterize the family as a whole. So far as is known, all species are diurnal and, although they wake up very early in the day, they appear to begin active foraging somewhat later in the dawn hours compared with some other avian groups. As described below (see Voice), many species of tyrant-flycatcher are among the first birds to sing in the pre-dawn light, and a large proportion of these early singers do so with a specialized "dawn song". The family's roosting habits are poorly documented, but most species spend the night perched quietly within dense vegetation. Those tyrannids that nest in cavities, such as members of the genera *Myiarchus* and *Myiodynastes*, may roost in these same cavities even when no eggs or young are present, but only one genus that builds an external nest, *Rhynchocyclus*, is known to use it as a dormitory for roosting outside the breeding period.

Most tyrannids spend a good part of the day actively foraging. As with most birds, peaks of activity occur during several hours just after dawn and in the late afternoon. Because most tyrant-flycatcher species use some version of the search-and-sally foraging style (see Food and Feeding), for much of the time a typical tyrannid is sitting still, with just the head actively moving around in search of prey, and occasionally either sallying to attempt a prey capture or moving to a new perch. Most species have a rather upright perching position, with the head held high and the bill at or slightly above the horizontal, and with the tail held nearly vertically downwards, although there are numerous exceptions to this general rule. While otherwise sitting still on a



Elaenias build relatively small and beautifully neat cup-shaped nests. They usually balance them on top of horizontal branches in large bushes or low trees, but this ***Plain-crested Elaenia*** *has placed it in an upright fork, maintaining stability by using narrow twigs as stanchions, and fixing the nest to them with spiders' webs. This species inhabits open* cerrado *habitats, where trees are infrequent, and most of its nests are placed in low shrubs. The two mouths inside this nest reveal the commonest size of clutches and broods for tropical tyrant-flycatchers.*

[*Elaenia cristata cristata*, Maranhão, Brazil. Photo: Anita Studer]

perch, many tyrannid species flick or pump the tail in characteristic rhythms or patterns. These tail movements are variously upwards, as typified by, for instance, the *Sayornis* phoebes, downwards, as in the case of certain *Empidonax* species, for example, or from side to side, as with the *Knipolegus* black-tyrants and some others; in some cases, the tail feathers are alternately fanned and closed, a habit typical of the *Stigmatura* wagtail-tyrants and a few other genera. Many species vocalize at regular intervals throughout the day while they are foraging or resting.

The social systems of tyrant-flycatchers are uniformly simple. Indeed, for a family as diverse and ecologically variable as the Tyrannidae, the lack of diversity in social organization is somewhat surprising. Virtually all species breed as territorial pairs (see Breeding), and most of the non-migratory tropical species appear to live throughout the year as simple pairs or small family groups on defended territories. Even when paired, many of these same species are as likely to forage solitarily as they are to feed together with the mate and offspring. A large proportion of the smaller-bodied, treetop-dwelling flycatcher species in the tropics and in forested habitats of the mountains regularly or always forage in mixed-species flocks, typically joining other species of tyrannid, along with tanagers, warblers, antbirds, furnariids, dendrocolaptids and woodpeckers (Picidae). Tyrant-flycatchers that live in the forest understorey also forage in mixed flocks, but seemingly less often than do those that live in the treetops. No tyrannid is gregarious throughout the year, but a number of species, especially in the genus *Tyrannus*, do travel in flocks containing dozens to hundreds of individuals during the migration and non-breeding periods (see Movements).

Nocturnal roosting is generally solitary, although the young fledglings of many species may roost in close proximity to, or even in physical contact with, one another. The Eye-ringed Flatbill (*Rhynchocyclus brevirostris*), and presumably its congeners, often roosts in the nest outside the breeding season, and apparently even builds "dormitory nests" for this purpose. This behaviour is unique within the family, although females of most of the cavity-nesting species will roost in the nest for several nights prior to egg-laying. A number of the large-bodied, yellow-bellied flycatchers in the subfamily Tyranninae frequently roost and, at times, nest in the same shrub or tree, usually an isolated, dense tree in a clearing or along a lakeshore. One large shrub beside a south-eastern Peruvian lake, for example, contained a roosting pair of Great Kiskadees, three Lesser Kiskadees, two Social Flycatchers, two Grey-capped Flycatchers (*Myiozetetes granadensis*) and a Tropical Kingbird. A large fig tree (*Ficus insipidus*) overhanging the same lakeshore held simultaneously active nests of the first four of these species.

Many species of tyrant-flycatcher engage in conspicuous display behaviour, most often in association with courtship interactions within a pair or aggressive encounters between two males. A number of species in different tyrannid groups have a concealed or semi-concealed crown patch, which may be white, as, for example, in the genus *Elaenia*, yellow, as in *Myiopagis*, *Tyrannulus*, *Myiotriccus*, *Myiophobus* and others, orange, as in many of the large-bodied tyrannines such as *Tyrannus*, *Pitangus*, *Myiozetetes* and relatives, or red, as in the Many-coloured Rush-tyrant. A few have a conspicuously shaped, bushy or flattened crest or "helmet", a distinctive feature of, among others, the Royal Flycatcher and the Helmeted Pygmy-tyrant (*Lophotriccus galeatus*). In all these cases, display behaviour regularly includes raising of the crown feathers vertically and somewhat laterally, exposing the colourful mid-crown patch, while facing the other individual, and is usually accompanied by active vocalizing and often by raising, spreading, fanning or fluttering of the wings. Some species engage in complex vocal duets during such displays (see Voice).

Perhaps the most amazing performance is that of the Royal Flycatcher. This species erects its crest feathers into a full semi-circle around the head, opens its bill wide to reveal a bright orange mouth-lining, and rotates its head about the axis of the neck, alternately in one direction and then in the other, in a very deliberate mechanical fashion, as if it were a wind-up toy. Presumably, this display is associated with courtship, territorial encounters or anti-predator behaviour, but few biologists have seen the display under natural conditions. Virtually all observations of the Royal Flycatcher with its crest raised have been by amazed biologists as they remove this species from the mist-net.

Species in the genera *Leptopogon*, *Mionectes* and *Pogonotriccus* have a peculiar habit of rapidly raising and lowering one



Here we are offered a rare glimpse into the private life of a widespread but easily overlooked species. An adult ***White-throated Spadebill****, a tiny sprite of the dark forest understorey, is about to feed a spider to its brood. Nest architecture is quite distinctive in this species: it builds a deep cup out of dry bamboo leaves and fine fibres, including, where available, the dark hyphae of "horsehair fungus"* (Marasmius). *It wraps this structure with spiders' webs, both to keep it firm, and to ensure a secure attachment to the supporting branches. The choice of prey is not surprising given the usual foraging mode adopted by this species: it is an expert at sally-striking to the underside of leaves. Also nicely revealed here are the characteristic short tail, large eyes, substantial rictal bristles and shovel-shaped bill.*

[*Platyrinchus mystaceus neglectus*, Monteverde Forest Reserve, Costa Rica. Photo: Michael & Patricia Fogden]

or, more rarely, both wings while foraging. The raised, open wing is held only momentarily in a vertical position high over the back, and is then snapped back into place as if it were a mechanical toy. This odd display can occur repeatedly every few seconds, and often takes place in the absence of conspecifics. Its function is unknown.

Numerous tyrant-flycatchers actively mob potential avian predators such as crows (Corvidae), hawks (Accipitridae) and owls (Strigiformes). In open country across North America, a common sight during the summer months is that of up to three or four Eastern Kingbirds closely pursuing an American Crow (*Corvus brachyrhynchos*) across a field, calling actively over the corvid and periodically diving at it and striking it with the bill. In tropical latitudes, the Great Kiskadee and the Social Flycatcher regularly mob and attack potential nest predators, including capuchin monkeys (*Cebus*), toucans and araçaris, hawks and falcons, and snakes. In one instance, a Great Kiskadee was observed as it vigorously attacked a Collared Forest-falcon (*Micrastur semitorquatus*), during which it rode on the falcon's back for several seconds. Phoebes, many species of *Myiarchus*, the two beardless tyrannulets, *Elaenia* species, the Vermilion Flycatcher and a good number of other tyrannids often participate in multiple-species mobbing aggregations, attracted by the predators themselves or by avian alarm calls.

The alarm response of a tyrant-flycatcher to snakes with aposematic coloration, such as coral snakes (Elaphidae), has been shown by S. M. Smith to be a genetically inherited trait. Smith raised young Great Kiskadees in isolation, prohibiting any contact with adult kiskadees or other birds. When she exposed these naive kiskadees to uniformly coloured wooden dowels, the birds showed no interest. When the dowels were painted with ring patterns typical of poisonous coral snakes, however, the kiskadees retreated to the far end of the cage and uttered scolding calls.

Anting behaviour has been reported for a variety of tyrant-flycatchers in all three of the typical subfamilies. The function of this peculiar behaviour, which involves the rubbing of the feathers of the belly, underwing and tail with the mutilated body of an ant held at the bill tip, remains unknown. As ants appear in the diets of many tyrannids (see Food and Feeding), the behaviour may serve in part as a means of reducing the amount of chemical defence, such as formic acid, in the body of an ant before its consumption.

Voice

With few exceptions, tyrant-flycatchers are vocally undistinguished. They share with the other suboscine passerines a relatively simple syrinx, lacking the more elaborate vocal apparatus of the oscine songbirds. All suboscines generally utter simple phrases, chirps or trills, many of which sound unmusical. In general, the daytime songs of tyrant-flycatchers are higher-pitched and significantly more variable than are the monotonous series of ascending or descending whistles and clucks typical of the furnariids, the dendrocolaptids, the antbirds and the tapaculos. Tyrannid songs consist mostly of one or a few whistled, warbled or modulated notes. Sometimes these are arranged into phrases or trills, but rarely do they have a complicated pattern and hardly ever would they be described as beautiful. It bears emphasis, however, that even the simple songs of tyrant-flycatchers are crucial species-specific isolating mechanisms, many of which allow clear differentiation, both by the birds themselves and by human observers, between what are otherwise exceedingly similar and closely related species. As with the other suboscine groups, it is generally assumed that the vocalizations of tyrant-flycatchers are entirely innate, although rather little research has been done to prove or refute this hypothesis.

Vocal qualities vary considerably among tyrannid groups. Insignificant, variably twittering peeps and trills are offered by many of the smaller species in the Elaeniinae, such as members of the genera *Phyllomyias*, *Zimmerius*, *Pogonotriccus* and *Phylloscartes*. Soft whistles, given singly or in ascending series, characterize most flatbills in the genera *Tolmomyias* and *Rhynchocyclus*. The *Elaenia* and *Myiopagis* elaenias typically utter a single, short, melodic phrase, examples being the burry "wher-cheeeer" of the Mottle-backed Elaenia (*Elaenia gigas*) and the soft "pil-dooeet" of the Forest Elaenia (*Myiopagis gaimardii*). Most fluvicolines have slightly louder and more recognizable primary songs. The "pee-o-weeee" song of the Eastern Wood-pewee is quite different from the high, burry "pt-cheeeeer" of its close relative, the Western Wood-pewee, and the ringing "quick-three-beers" of the largest pewee, the Olive-sided Flycatcher.

By far the most vocally raucous of all tyrant-flycatchers is the Great Kiskadee. Its harsh, loud "kis-ka-dee!" calls are often shouted boldly and repeatedly by both members of the pair in



*The nest of the **Many-coloured Rush-tyrant** is a tiny cone-shaped cup, a bit like an ice-cream cone attached to a single reed stalk, and the outer surface of the nest is coated with a strange gum. The female constructs the cup alone, using wet material which dries and hardens to form a cardboard-like crust. This rigidity helps to maintain the shape of the nest despite the constant movement of the swaying stem to which it is attached. This image shows how the species earned its local name of "Siete Colores", or seven colours. The dramatic red crest is often invisible in the field, but is flared conspicuously during aggressive interactions and courtship display, especially around the nest.*

[*Tachuris rubrigastra rubrigastra*, Provincia de Cardenal Caro, Cahuil, Chile. Photo: Manuel Marín]



*The **Cliff Flycatcher** is one of few tyrannids that habitually nest on rock faces. It commences the nest-building process by building a ring of stones on a ledge, which helps to increase stability once the nest is built. The nest itself is an untidy cup of plant fibres and grasses. Because of its cliff-nesting habits, the Cliff Flycatcher is pre-adapted to man-made structures, such as bridges and buildings. In some cities, such as São Paulo, it has learnt to nest on blocks of flats and commercial high-rises.*

[*Hirundinea ferruginea sclateri*,
La Trampa, Táchira,
Venezuela.
Photo: Peter Boesman]

territorial declaration as they perch together atop a tall tree. In their most animated sequences, both pair-members alternately raise and lower the wings stiffly above the back in time with the loud calling. The same birds often intersperse their "kis-ka-dee" displays with a single, long phrase of similar quality, "keeeeeeeerrrrr".

Pygmy-tyrants and tody-tyrants share a distinctive vocal quality unlike that of any other flycatcher group. They utter mechanical "pip" notes, some metallic and others quite nasal, and often as a rapid series or trill. These notes may ascend the scale in a series of separately uttered, piping notes, as in the case of, among others, the Black-throated Tody-tyrant. Alternatively, they may remain at the same pitch in a rapid trill, such as that given in the Central American and Andean montane forests by the Scale-crested Pygmy-tyrant, the distinctive voice of which sounds like a police whistle. In complete contrast, the short, extremely high-pitched trill of the Short-tailed Pygmy-tyrant cannot easily be separated from insect sounds in the tropical forest.

Although the Sirystes can be difficult to see, as it spends almost the entire time in the highest part of the forest canopy, its distinctive call enables the observer to locate it. This species' ringing "wher-péw…wher-péw-péw-péw-péw" can be heard from the human vantage point on the forest floor up to a kilometre away.

The Ochre-bellied Flycatcher is silent over most of the year, but certain males take up and defend calling stations within the forest during the breeding season. Within these small areas, measuring 100-750 m² in extent, individual males perch usually at heights of 3-10 m and call incessantly, throughout the day, for weeks and even months on end. The typical call at these leks (see Breeding) is a deliberately paced series of paired, piping notes, "whip whit, whip whit", repeated up to ten times, followed by a more animated series of "chit" notes in more rapid succession.

In addition to primary, daytime advertising songs, the majority of tyrant-flycatchers also produce very simple, single-note or double-note contact vocalizations, or position-calls, that are species-specific. Most of these are short "chip" or "peep" notes of varying pitch, intensity and timbre. Some are uttered apparently as contact notes between members of a pair or within a mixed-species flock, whereas others are given each time a foraging flycatcher changes its perch.

A number of tyrannids, especially in the subfamily Fluvicolinae, sing elaborate, even melodious songs in conjunction with courtship or territorial displays (see Breeding). A well-studied example is that of the Vermilion Flycatcher, the male of which sings a long jumbled series of sweet whistles and warbles during its long display-flights over open fields. The Streamer-tailed Tyrant, on the other hand, displays from a perch, where piercing whistles, warbles and bill-popping sounds are made in a mutual display between male and female.

Most pygmy-tyrants and tody-tyrants sometimes produce audible wing-whirring sounds when moving from perch to perch. In addition, a few species engage in rapid wing-flapping displays from a perch, during which the wings produce a mechanical buzzing or whirring sound. The feathers of some of these species, such as the Pale-eyed Pygmy-tyrant, are modified to aid in this sound production (see Morphological Aspects). The complex advertising songs of the doraditos in the genus *Pseudocolopteryx* include bill-snapping and wing-buzzing. Males of the Crested Doradito engage in dramatic displays associated with these songs, given both on the perch and in the air (see Breeding). As mentioned previously (see Morphological Aspects), males of this species have modified primaries and barbules, both features apparently playing a role in the peculiar wing-buzzing component of the aerial display.

The most distinctive feature in the vocal repertoire of tyrant-flycatchers is the dawn song, which is generally lacking in the other groups of suboscine passerines. The dawn song is uttered by a perched, otherwise motionless individual during a "waking-up" period of 10-30 minutes, beginning just as the very first light of dawn appears, and well before most other birds begin to vocalize. These dawn songs in general are short, ringing phrases repeated over and over again, incessantly, while the bird remains on a single perch. They sometimes contain components of, or slight variations on, the more typical advertising songs that are uttered individually throughout the day. Quite often, however, the dawn song is utterly distinct from the daytime song and, except on rare occasions, is not delivered at any time other than during first light of dawn or, more rarely, at last twilight. The phenomenon characterizes tyrant-flycatchers as far north as eastern North America, where in mid-June, at the first hint of dawn's light, one can hear simultaneously Eastern



*The **White-headed Marsh-tyrant** builds a globe-shaped structure of dry grasses and feathers. It usually attaches this messy ball to several reeds, or to the branches of a small aquatic shrub. As this nest is such a conspicuous bundle, it is difficult to hide from predators, but the ball-shaped nest has a very small entrance and is almost always placed over standing water. These strategies serve to minimize opportunities for mammalian predators to raid the nest.*

[*Arundinicola leucocephala*, Esteros del Iberá, Corrientes, Argentina. Photo: Hernán Povedano]

Wood-pewees, Alder and Willow Flycatchers, Great Crested Flycatchers and Eastern Kingbirds as they repeat their songs rapidly and ceaselessly, for many minutes on end. In western and south-western North America, Cassin's Kingbirds and Vermilion Flycatchers are strong dawn singers. Farther south, in the mountains of Central America, the little Tufted Flycatcher, the daytime song of which is a simple series of weak whistles, utters at daybreak, ceaselessly for 20-30 minutes, a remarkable refrain of sweet, rapidly jumbled notes from a high, exposed perch; A. F. Skutch transcribed a piece of one such bout as "bip-bip-bip-dididididup-bip-bip-bibibiseer". The dawn song becomes a most remarkable chorus in the tropics, where in the earliest moments of dawn, in a South American scrub or lakeshore setting, the human observer can hear the endlessly repeated songs of 15 or more species of flycatcher, the very first birds to begin singing.

Almost all tyrant-flycatchers, from the smallest tyrannulets to the largest kingbirds and their relatives, utter distinct dawn songs. These are so stereotyped and so species-specific that a major taxonomic revision of the genus *Myiarchus* included a key to the species based solely on the acoustic features of their respective dawn songs. Moreover, several newly discovered tyrannid species have been first detected by astute field observers who heard unfamiliar dawn songs (see Systematics).

Food and Feeding

As the family name at least casually implies, by far the predominant food resources for tyrant-flycatchers of every taxonomic group are insects and other arthropods, the latter including, for example, arachnids, millipedes (Diplopoda) and centipedes (Chilopoda). Small fruits are the second most common food category, and small vertebrates such as tree-frogs, tadpoles, lizards, small snakes and fish are taken by a limited number of larger tyrannids. The members of this family employ an enormous variety of searching and prey-capture techniques, but they invariably capture and deal with all food items by using the bill.

Extensive studies of the stomach contents of 16 sympatric tyrant-flycatchers in Costa Rica, carried out by T. Sherry, and of those of 28 sympatric species in the Amazonian lowlands of south-eastern Peru, undertaken by A. Begazo, exemplify the diversity of prey items consumed by tyrant-flycatchers, and illustrate a few patterns of specialization. Stomachs of all but one species in Costa Rica and all but two in Peru contained beetles of numerous different families. The Ruddy-tailed Flycatcher was an exception in both studies, taking almost exclusively fulgoroid homopterans, and the other exception in Peru was the Short-crested Flycatcher, which fed predominantly on ants and wasps (Hymenoptera), assassin or stink bugs (Reduviidae) and cicadas (Cicadidae). The majority of species in the studies also consumed, in addition to beetles, combinations of numerous ants and wasps, spiders (Arachnida), cicadas and leafhoppers (Homoptera), and lepidopteran larvae. Also represented were a variety of scorpions (Scorpiones), dragonflies (Odonata), katydids and crickets (Orthoptera), flies (Diptera), true bugs (Heteroptera) and earwigs (Dermaptera). Prey sizes ranged from tiny, such as unidentified arthropod eggs and small ants, to several centimetres in length, such as dragonflies, cicadas, small frogs and small lizards. In both regions, aerial salliers were prone to take flying ants, wasps and bees. The diets of species that forage in the densest vegetation tended to be higher in beetles, spiders, planthoppers and non-flying ants. Seven of the 16 species in Costa Rica had consumed fruit, but corresponding data were not reported for the Peruvian site.

The ecological diversity of tyrant-flycatchers as a family is manifested most clearly in the range of foraging styles and associated habitat preferences found across its different evolutionary assemblages. Almost all tyrannids search for food by using some modification of a single basic procedure, the search-and-sally technique, in which an individual pauses for varying lengths of time on a perch or on the ground, and then either moves quickly after a prey item or gives up the position and moves to a new one. Active, exploratory types of behaviour, such as probing, tearing, gaping, leaf-scratching and the searching of dead leaves, or other active food-seeking methods, are extremely rare among the Tyrannidae. For the most part, therefore, foraging by tyrant-flycatchers is a visual searching procedure. A large part of the variation in searching strategies involves the amount of time for which a flycatcher typically pauses before either sallying or "giving up". Over the family as a whole, these search times vary approximately with body size, but sally technique and the density of

vegetation cover also play a role in determining the pace of movement of an actively foraging tyrannid.

Prey capture is accomplished by a variety of manoeuvres, mostly quite stereotyped, and these movements are closely associated with specific morphological adaptations of the bill, wing and tarsus (see Morphological Aspects). Aerial hawking is the foraging method that many birdwatchers know as "typical" flycatcher behaviour. The foraging bird sits relatively motionless on an exposed perch, with the head moving rapidly from side to side and up at sharp angles as it searches for, and often tracks, flying prey. The sally is a rapid flight directly out to snatch the insect in mid-air with the bill tip, often making an audible snap as the mandibles close on the prey. Aerial hawkers are patient foragers, sometimes sitting on the same perch for minutes on end before sallying or, if necessary, moving to a new perch. Species that habitually use this foraging mode, such as the Cinnamon and Cliff Flycatchers and those in the genera *Contopus*, *Mitrephanes*, *Empidonomus*, *Griseotyrannus* and *Tyrannus*, regularly return again and again to the same spot in order to search for prey. Typically, the Cliff Flycatcher, even after unsuccessful sallies, returns to its cliff-face site to resume searching from a perch, but occasionally it engages in extended, acrobatic and even multiple pursuits of aerial prey. Various studies have demonstrated that aerial hawkers tend to gauge the relative value of a perch very carefully, staying at the perch if it regularly produces prey and abandoning it if it does not. Indeed, it has been shown that the longer an individual had to wait before making a sally, the less was its tendency to return to the same perch to resume searching.

The commonest prey items for aerial-hawking tyrant-flycatchers are large flying insects. Eastern Kingbirds, for instance, frequently perch near the hives of honeybees (*Apis*) in order to sally after the flying insects; it is said that they favour the slightly heavier-bodied males, or drones, over the faster-flying female bees. An exhaustive survey of the stomach contents of Eastern Wood-pewees revealed that about 30% were hymenopterans and 30% dipterans, with 12% lepidopterans and 10% coleopterans. In a study of this species in its non-breeding quarters in south-eastern Peru, 92% of the contents of stomachs consisted of Hymenoptera. At the latter site, 68% of 94 prey items of Tropical Kingbirds were hymenopterans and a further 20% were flying termites (Isoptera). At study sites in both Costa Rica and Peru, the Long-tailed Tyrant, an obligate aerial hawker, also took mainly hymenopterans, which at the former site consisted almost exclusively of stingless sweatbees of the genus *Trigona*. Sherry hypothesized that this flycatcher preferentially forages near *Trigona* nests.

Although almost every member of the family occasionally engages in aerial hawking, most species are not obligate hawkers but can be referred to, instead, as "sally-gleaners". In this method of foraging, the individual flies with a rapid sally from its perch towards a prey item that is sitting on some substrate, such as a leaf, a twig, a trunk, a rock or the ground. The item is picked or snatched from the substrate, not from the air. Foraging sally-gleaners pause at each perch in order to search the surroundings, including twigs, vegetation, trunks, the ground and any nearby water, and may only rarely snatch flying prey on the wing. There are several common forms of sally-gleaning that lead to quite different morphological and behavioural specializations, as outlined in the following few paragraphs.

Hover-gleaners typically perch in small openings within vegetation, or on exposed perches overlooking it, and cock the head at all angles, enabling them to examine the leaf surfaces for prey. They make rapid sallies towards prey, but usually snatch the food from the leaf surface during a brief to extended, stationary hover. *Leptopogon* flycatchers, such as the Sepia-capped Flycatcher (*Leptopogon amaurocephalus*), and the true bristle-tyrants, typified by the Spectacled Bristle-tyrant, usually perch on exposed twigs under vegetation and sally upwards to snatch prey with an upward-directed hover-glean, the body held almost vertically below the prey. These tyrannids have a long and cylindrical bill with a slight hook, similar to the bill of many vireos, another family that often hover-gleans. The *Myiarchus* flycatchers, along with the related Sirystes and Rufous Casiornis (*Casiornis rufus*), typically perch more in the open, overlooking dense vegetation, where they make outward or downward bobbing movements of the head to peer at odd angles in characteristic searching behaviour that can last for up to a minute at each perch. They sally outwards or downwards to snatch prey, often lepidopteran larvae, with a brief hover-glean, frequently slowing down only slightly and crashing into the vegetation, with a follow-up flight that carries them through to a new perch. Often they make an audible snap as they grab the food item. Hover-gleaners rarely



Anyone looking at this photo might be forgiven for concluding that the ***Cattle Tyrant*** *builds an enormous nest out of sticks, a highly unusual construction for a tyrant-flycatcher. As it happens, the tyrant's nest is relatively small, but is often sited opportunistically, and this bird has appropriated the abandoned nest of a Greater Thornbird* (Phacellodomus ruber). *The furnariid usually navigates a funnel at the base of its monstrous residence, but this nest has collapsed on one side, allowing the tyrant to build its cup-nest in a protected spot. Most Cattle Tyrant nests are located in secluded recesses, such as deep within branching palm fronds.*

[*Machetornis rixosa rixosa*, Minas Gerais, Brazil. Photo: Anita Studer]



Some members of the genus Tolmomyias *build an unusual nest rather like that of an icterid. It is typically constructed with black fungal hyphae and rootlets, and is shaped like a retort flask, with a tunnel entrance angled downwards. In some regions, the majority of nests are placed in the vicinity of colinies of wasps* (Chartergus, Polybia, Polistes)*, a defensive measure against predation. This* ***Yellow-olive Flycatcher*** *is far more likely to raise a brood with a horde of stinging insects guarding her nest. Once the nest is completed, the owner rarely clings to the outside, but usually flies directly in and out of the nest entrance.*

[*Tolmomyias sulphurescens cinereiceps*, Santa Rosa National Park, Costa Rica. Photo: Marie Read]

return to the same perch after a sally, but keep moving as if traplining through the foraging territory. An extensive study of the diet of one *Myiarchus* species, the Great Crested Flycatcher, across eastern North America revealed that the stomach contents consisted of 21% lepidopterans, 17% coleopterans, 16% orthopterans, 14% hemipteran bugs and 14% hymenopterans.

The upward strike is a highly stereotyped form of sally-gleaning in which prey is snapped or "scooped" from the undersurfaces of leaves during a rapid upward flight, or strike, directly from below. Tyrannids that practise this foraging style most frequently, such as the widespread White-throated Spadebill in the genus *Platyrinchus* and the tody-flycatchers in the genus *Todirostrum*, usually pause on each perch for 15-45 seconds before either giving up or sallying. Invariably, they search upwards from each perch. Specialists in this foraging mode have a distinctively broad, even shovel-shaped, bill and well-developed rictal bristles. Dietary studies of upward strikers, including the two aforementioned genera and members of *Tolmomyias*, *Hemitriccus* and *Lophotriccus*, demonstrate that they take a broad diversity of arthropods, with beetles, especially weevils (Curculionidae), and planthoppers (Fulgoroidea), bugs, lepidopteran larvae and spiders predominating.

Of particular interest is the Ruddy-tailed Flycatcher. This species employs an unusual foraging method termed "flush-chasing", in which the bird dislodges prey from a leaf or twig with a quick sally, and then rapidly and erratically chases it downwards and through the forest for up to several seconds. In Costa Rica, Sherry discovered that the Ruddy-tailed Flycatcher uses this unique foraging manoeuvre to feed almost exclusively on homopteran bugs, especially leafhoppers and planthoppers, which accounted for 46 of 65 prey items recorded. The same has now been shown for this species in the Amazon forest of south-eastern Peru, where 45 of 47 documented prey items were fulgoroids. Few other groups of foliage-gleaning birds are so restricted to just a single taxon of insects.

Another common method for gleaning prey from the vegetation is perch-gleaning, which involves no sallying at all. Many warblers and vireos also forage in this manner, and it is not surprising that those tyrant-flycatchers that use this style extensively tend to be small, active warbler-like birds with a thin, needle-like or tweezer-like bill. The foraging individual searches leafy vegetation, examining leaf surfaces and peering into folds and cracks at extremely close range, during very brief pauses of typically only one or two seconds in duration. Prey such as spiders, small lepidopteran larvae, beetles and ants are simply picked from the substrate within the reach of the foraging bird. Most perch-gleaners are in the subfamily Elaeniinae, and include, among others, the Northern Beardless Tyrannulet and the White-crested Tyrannulet (*Serpophaga subcristata*).

Terrestrial foraging is uncommon in the Tyrannidae, but it has evolved independently within several lineages. Most of the prey-capture techniques used by arboreal flycatchers are found also among terrestrial ones. An intriguing example is represented by the two species in the genus *Corythopis*, the Ringed and Southern Antpipits. These are entirely ground-walking tyrannids inhabiting moist tropical forests, where they walk deliberately across the leaf litter of the forest floor, but they search for prey mainly by looking upwards. They capture a wide variety of prey items from the underside of ground-storey vegetation, just a few centimetres above them, by means of upward strikes. A study of stomach contents of Ringed Antpipit specimens from south-east Peru revealed that, of 61 prey items identified, flower beetles constituted 21%, click beetles (Elateridae) 10% and weevils 3%, with ants making up 20%, wasps 7%, spiders 3% and scorpions each 3%, planthoppers 5%, cicadas 3%, katydids 2%, and lepidopteran larvae and pupae 10%; even small frogs were found, accounting for 3% of recorded items.

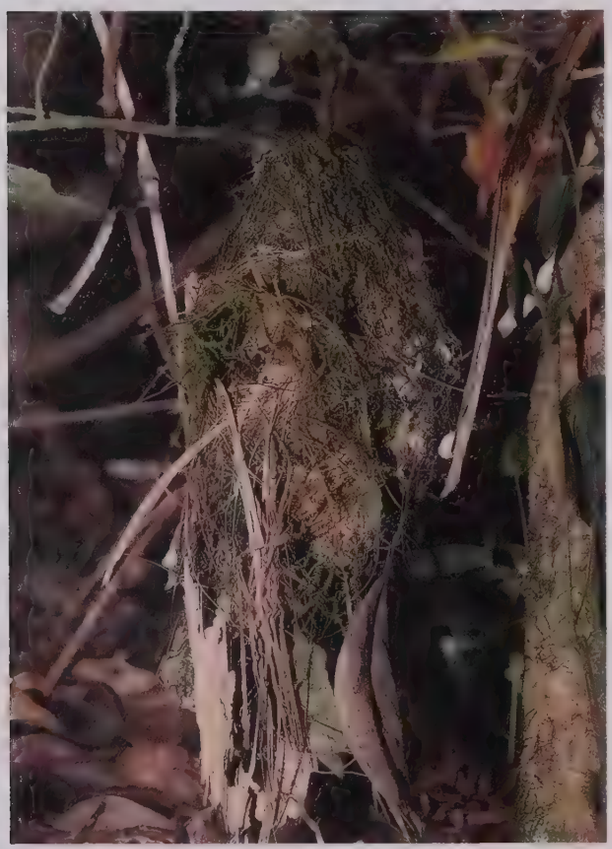
A large radiation of genera in the Fluvicolinae, occupying open habitats of eastern and southern South America and the high Andes, displays a graded series of ground-oriented foraging techniques. The first stage is perch-to-ground foraging, in which individuals perch on elevated rocks, branches, fence posts, wires or rooftops and search the ground below for insects or small vertebrates. Perch-to-ground specialists sally to the ground, capture a prey item, and return to the elevated perch to devour it and to resume searching. Many species simply snatch an insect from the surface and return to the perch without stopping, but some may alight on the ground and deal with the prey there. The *Xolmis* monjitas of the open habitats in Brazil, Uruguay, Paraguay and Argentina are advanced perch-to-ground specialists, as are the large, shrike-like predators in *Myiotheretes*, *Agriornis* and related genera inhabiting the high Andes and Patagonia. These species take especially big prey, such



Some of the most elaborate of tyrannid nests are made by small species inhabiting the forest understorey. The nest of the ***Ochre-faced Tody-flycatcher*** *is a typical example. It is a purse-shaped structure, suspended by plant fibres from a twig. It has a concealed side entrance, often protected by a "visor", and it is usually lined with very fine downy material, such as seed down and feathers. This species, like many others in the family, sometimes places its nest near active nests of paper wasps* (Polistes)*, which are armed with a vicious sting.*

[*Poecilotriccus plumbeiceps*, Alagoas, Brazil. Photo: Anita Studer]

as large beetles, grasshoppers, moth larvae, and even lizards and snakes. The most advanced terrestrial foragers in this radiation accomplish most or all of their prey-searching while standing on the ground, where they make fast runs or quick sallies to capture food items from the ground surface or low vegetation. Terrestrial specialists of this type include most of the *Muscisaxicola* ground-tyrants and the sole member of the genus *Neoxolmis*, the Chocolate-vented Tyrant, which is the largest.



To the untrained eye, and to many potential predators, there is nothing to be seen in a scene like this but a tangle of debris in the understorey. By cleverly incorporating flakes of bark, dead leaves, moss and any material that helps give the impression of random detritus hanging in the understorey, the ***Eye-ringed Tody-tyrant*** *conceals her nest from predators. Accessible though a side entrance, just visible here, is the downy cup where she will lay her eggs. Nests of this type are extremely difficult to locate unless the female is seen entering or leaving.*

[*Hemitriccus orbitatus*, Serra da Cantareira State Park, Guarulhos, São Paulo, Brazil. Photo: Dante Buzzetti]

Rufous-webbed Bush-tyrants are perch-to-ground specialists that, in the incessant high-Andean wind, also frequently hover or glide with the wings high over the head as they search for, or get a bearing on, prey amid the rocks and tussock grass above the tree-line. Similarly, the Dark-faced Ground-tyrant (*Muscisaxicola maclovianus*), although typically a pipit-like ground-forager, will often hover over open areas for long periods, with its tail spread wide, as it watches for potential prey items from mid-air; it then flutters or parachutes down and, just as it lands, snatches an insect.

The Great Kiskadee is probably the most omnivorous of all tyrant-flycatchers. A widespread and relatively common species in open habitats throughout the tropical Americas, the kiskadee frequently takes advantage of whatever local source of large food items it can find, including fish, lizards, frogs, tadpoles, baby birds, all manner of fleshy fruits, millipedes, large beetles, carrion, and even garbage from a rural back yard or the town dump. This species is very often found near water, where it hunts in a fashion very similar to that of kingfishers (Alcedinidae); the kiskadee plunges from a low perch to pick a fish or tadpole from the water, flies to a nearby perch, and beats the prey back and forth on the branch until it can be swallowed. One Great Kiskadee in eastern Brazil was timed as it beat a 5-cm cichlid fish for 13·5 minutes before swallowing it. Kiskadees sometimes even hover over a large waterbody like a kingfisher in order to spot a tadpole, which they pluck with a quick dive.

Many of the largest-bodied tyrant-flycatchers prey on vertebrates, especially frogs and lizards. The Great Shrike-tyrant of Chile and southern Argentina occasionally preys on fledglings of other bird species, and has been observed to capture and kill a medium-sized hummingbird, a Green-backed Firecrown (*Sephanoides sephaniodes*), that was feeding in a mistletoe patch. The largest of all tyrant-flycatchers, it has also been recorded as preying on the high-Andean long-haired mouse (*Akodon longipilis*). Many of the larger bush-tyrants and ground-tyrants frequently capture terrestrial lizards on the run. All seven species in the genus *Attila* have a sharply hooked bill and regularly attack and subdue very large prey, including large spiders, huge noxious caterpillars, large beetles, arboreal lizards and snakes, and frogs. Four of 13 prey items in the stomachs of Bright-rumped Attilas were arboreal lizards. Similarly, the Boat-billed Flycatcher,

which lives high in trees, uses its massive bill to snatch very large prey items, ranging in size from moths and beetles up to arboreal snakes and lizards, from the undersides of leaves.

Frugivory is widespread among all groups of tyrant-flycatchers, and almost every species in the family will consume an occasional ripe fig, mistletoe berry, melastome fruit or *Cecropia* fruit, or a small, pulpy drupe, such as a fruit of Lauraceae or Anonaceae, high in the forest canopy. Fruit forms a significant proportion of the diet throughout the year for many species in the subfamily Elaeniinae, especially those in the genera *Phyllomyias*, *Phaeomyias*, *Myiopagis*, *Elaenia*, *Mionectes* and *Zimmerius*. The Paltry Tyrannulet (*Zimmerius vilissimus*) is virtually a specialist on mistletoe berries, and consumes hundreds of these each day over much of the year. Its habit of regurgitating the sticky seeds by wiping them off on the perch is a principal means by which the mistletoes are dispersed throughout the mid-montane forests of Central and northern South America. Nearly obligate, year-round frugivory by members of the genus *Mionectes* provides the evolutionary backdrop for their lekking social system (see Breeding), which is unique among the Tyrannidae.

Almost all species in the subfamily Tyranninae are to one degree or another frugivorous in all months of the year, and a few of them rely on fruit as a primary resource every day. The Piratic Flycatcher in the monotypic genus *Legatus* is the most pronounced fruit-eater, but its close relatives in the genera *Myiodynastes*, *Myiozetetes* and *Conopias* eat fruits all year as well. Several members of this assemblage, such as the Social Flycatcher and the Great Kiskadee, are known to feed their young with pulpy fruits, along with insects, especially near the end of the nestling period.

Finally, the Sharp-tailed Tyrant, an elaeniine tyrannid, is possibly distinct from all other members of the family in one particular aspect of its diet. Field observations suggest that this grassland-inhabiting species feeds not only on insects, but also on the seeds of grasses and weed plants.

Breeding

All tyrant-flycatchers in North and Central America breed during the northern spring and summer, mainly between March and July. In the southern USA, breeding by Eastern Kingbirds, Great Crested Flycatchers and Black Phoebes begins as early as mid-March. Species that breed high in the mountains, such as the Dusky Flycatcher, or in the northern USA and Canada, such as the Olive-sided Flycatcher, generally do not start to nest until early May. In the lowlands of northern South America and in the Andes north of central Peru, most breeding takes place from January to June. Farther south, in the southern Andes and the lowlands south of the equator, the breeding season of virtually all tyrannids spans the period from August through to January. Typically, the members of this family raise only a single brood of young each year.

The predominant social system of tyrant-flycatchers, in both temperate and tropical latitudes, is the monogamous pair-bond, with each pair defending its own territory. Monogamous social organization does not, however, guarantee genetic monogamy. In the USA, genetic examinations for extra-pair paternity in the Eastern Kingbird in central New York State revealed that 60% of nests contained young sired by a male other than the territory-holder. Of 64 nestlings genetically profiled, 42% were sired by extra-pair males, but conspecific brood parasitism was absent. By contrast, in a separate study of the same species, in Michigan, 39% of nestlings were unrelated to either one or both parents, and conspecific brood parasitism was implicated in most of these cases.

Species in the genus *Mionectes* are the only tyrant-flycatchers known to exhibit lek behaviour, and the social systems of several of these species have been studied in detail by D. W. Snow, E. O. Willis and, especially, D. Westcott. One of them, the Ochre-bellied Flycatcher, is the most abundant forest tyrannid in many lowland habitats throughout South America. Its abundance is probably related to the fact that it is highly frugivorous, perhaps more so than any other member of the family. Females are capable of regurgitating large quantities of fruit pulp with which to feed the young, thereby emancipating males from nest duties, a prerequisite for lek breeding systems. Females usually construct their hanging, oven-shaped nests over streams inside the forest, and do not establish pair-bonds with any particular male. Instead, throughout the breeding season, some males sing and display within a loosely defined area, the lek, in which two to six individuals are within earshot, but not visual range, of one another. Other males display solitarily, and still others, about 10%



*The **Sepia-capped Flycatcher** sometimes works for more than a month to construct its distinctive pendent nest. It builds a compact oval, often camouflaged with a variety of live moss and debris, and sometimes appended by a hanging "tail" of similar material. These nests often dangle from bare roots where banks have been undercut, as shown here. For this reason, a lucky walk along a forested creek may result in one of these structures being encountered, usually hanging at head height. Their love of overhangs also means that* Leptopogon *flycatchers regularly nest under the eaves of buildings situated in forested habitats.*

[*Leptopogon amaurocephalus amaurocephalus*, Minas Gerais, Brazil. Photo: Anita Studer]



The nests of Mionectes *are quite similar to those of* Leptopogon *in structure. They are a hanging ball of moss and debris, but they are distinctly smaller, less often situated at overhangs, and more often out of reach over wider streams. Although the sexes are virtually indistinguishable in this genus, this* ***Grey-hooded Flycatcher*** *is almost certainly a female because, unlike all other tyrant-flycatchers,* Mionectes *are obligate year-round frugivores with a breeding system remarkably similar to manakins (Pipridae). Males occupy positions at leks and females take sole responsibility for raising the brood. Thus, no male is ever likely to be seen attending a nest.*

[*Mionectes rufiventris*, Minas Gerais, Brazil. Photo: Anita Studer]

in one study, behave as subordinate "satellites" on the territories of displaying males, and may eventually replace the owner of a display territory. Finally, about half of the males are not associated with a display territory at all; these behave as "floaters" and move widely through the forest, often intruding on displaying males' territories. Aggression among males, especially by those holding display territories, is very common. Females visit the lekking males, and the male with the highest visitation rate and, presumably, the highest copulation rate tends to be in the largest lek and tends also to have the highest song rate. In one study, experimentally muted males suffered far greater levels of intrusion by other males than did non-muted ones, and five of six experimental males quickly lost their territories to intruders. Thus, song plays a key role in interactions between males at leks, and is also used by females as a means of assessing potential mates. The locations of leks in the forest are correlated with travel routes regularly used by females.

The peculiar tail feathers and aerial displays of both species in the genus *Alectrurus*, the Cock-tailed and Strange-tailed Tyrants, strongly suggest a polygynous mating system in which sexual selection has produced extreme sexual dimorphism, including male ornamentation. Indeed, preliminary studies in the field bear out this possibility. Males of both species appear to defend territories in grassland and grassy marsh habitats, where they perform striking display-flights over females in the grass or reeds below. Observations have revealed that some territories contain several females. Further fieldwork may well produce some interesting findings with regard to these two unusual tyrannids.

The most elaborate displays in the family are those of the sexually dimorphic, fluvicoline species that inhabit scrub, grassland and marshes in southern Brazil, northern Argentina, the Paraguayan Chaco and the high Andes. Strangest of all is that of the Spectacled Tyrant, the spectacular aerial courtship display of which was first described, with wonderful imagery, by Hudson in 1920. The all-black males "perch on a conspicuous place, upright, motionless, and looking more like grotesque little automata than living things"; the displaying male, "as if shot from [the perch] by means of a steel spring... darts vertically to a height of about fifteen yards, then turns a somersault, uttering at the same moment a shrill little cry, after which it drops down again and alights on its perch suddenly, as if jerked back to it". During the descent, the wings of the Spectacled Tyrant are held stiffly half-open, showing the white patches, and the vibrating primaries produce a rattling or buzzing sound.

Almost as striking is the display given by another fluvicoline, the Andean Black-tyrant (*Knipolegus signatus*), in which the male repeatedly flies straight up into the air for 2-10 m, and then drops straight back down with the wings folded, spreading them immediately before crashing to the perch. Its congeners mostly perform fairly similar displays. For example, the White-winged Black-tyrant (*Knipolegus aterrimus*) repeatedly makes a short flight up, stalls with the body and tail pointing vertically downwards, then topples backwards before pulling out of its dive to return to its perch, sometimes emiting a faint vocalization. The ground-tyrants also perform elaborate aerial displays during the breeding season. The male Rufous-naped Ground-tyrant (*Muscisaxicola rufivertex*), for example, flies up to 10-15 m above the open ground and hovers or hangs in the wind, with the wings high over the back, uttering a thin two-note whistle. Dark-faced Ground-tyrant males, on the other hand, stand upright near a female and raise and lower the wings, or raise the wings and hold them high overhead for up to 10 seconds, before making a short run and repeating the display. During the breeding season, the male Vermilion Flycatcher launches into long aerial flights over open fields; in these displays, which are accompanied by the pleasing song (see Voice), the bird often holds its wings up over the back, producing the appearance of a fluttering butterfly.

Mutual displays between the two sexes are a feature of some tyrannids, of which the Streamer-tailed Tyrant is one example. Sitting close to each other on the top of the same low shrub, or an adjacent one, the male and female bob up and down on a perch, flap the wings, and alternately raise and lower the long tail, while uttering loud calls (see Voice). Deliberate wing-flapping is a common element in displays throughout the family, and is often performed in conjunction with vociferous calling and crest-displaying. Some species, such as the *Ochthoeca* chat-tyrants and the *Fluvicola* water-tyrants, at times exaggerate this wing-flapping by holding the wings outstretched or flapping them broadly and stiffly while perched. Others flutter the wings rapidly, either in flight, as do the kingbird species, or while on a perch, as typified by the Cattle Tyrant and the Great Kiskadee.



The pendent nests of Myiobius *species tend to lack "tails" of camouflaged material and they usually have a slanted or pyramid-shaped roof of twigs or rootlets. This* ***Whiskered Flycatcher*** *has built her nest fairly low down in the undergrowth, but others are situated in the middle storey, or over a ravine for protection. This species, in common with several others in the genus, has a bright yellow rump and a distinctive foraging technique. Like the New World redstarts* (Setophaga), *and the Old World fantails* (Rhipidura), *they hold the tail cocked and fanned while foraging, and switch it conspicuously from side to side, possibly to disturb hidden insects.*

[*Myiobius barbatus insignis*, Alagoas, Brazil. Photo: Anita Studer]

Males of the doraditos in the genus *Pseudocolopteryx* engage in dramatic displays in association with their complex songs (see Voice), given both on the perch and in the air. The male Crested Doradito jerks the head back and forth as it sings, rapidly raising and lowering the crest while snapping the bill; the whole body appears to convulse in rhythmic hiccups as the male sings and performs bill-snaps. In the aerial display, the doradito flies upwards for several metres with butterfly-like wingbeats, the body hanging vertically, and occasionally throws back the head during a bill-snap.

Another type of display is demonstration of the nest-site, carried out by the phoebes. With the body held vertical and the tail fanned, the male phoebe hovers for 5-10 seconds just off the nest, which can be either a new one or an old one, or at a bare wall at an intended site. It may repeatedly land on the site and repeat the hover. The female often flies to the site or clings to the wall near the hovering male.

Artificial structures are widely used as nesting sites by the members of this family, and this habit is particularly marked among the phoebes. Across eastern North America, the most common nest-sites of Eastern Phoebes are on ledges such as support beams, drainpipes, window sills, bridge abutments, railroad trestles and barn rafters; the universal requirement is that the site has a closely overhanging protective feature, such as a roof, eave, deck, bridge structure or the like. Say's Phoebe (*Sayornis saya*) of western North America nests in abandoned mines and other buildings, bridges, barns, outhouses, wells, old cars and, once, even a horse trailer; recorded nest-sites of this species include rafters, girders, beams, shelves, electrical fixtures, ledges, drainpipes, eaves, machinery and mailboxes. The third member of the genus, the Black Phoebe, requires that the site be over water, and it regularly builds on bridges, on culverts, and under eaves of buildings bordering streams or lakes. The nesting habits of the phoebes stem from the tendency, under natural conditions, for all three species to nest on cliff ledges protected by closely overhanging rock. Studies of the reproductive behaviour of Black Phoebes in California revealed that a minimum of 2% to a maximum of 59% of nests were placed on natural structures.

The Great Kiskadee builds its bulky nest in a wide variety of locations that include man-made structures such as utility poles and transformers, multiple-dormitory birdhouses, and crevices in building facades. Many other tyrannine flycatchers besides the kiskadee exploit artificial sites. Social Flycatchers, for example, usually build on exposed snags, often over water, but they also use utility poles, abandoned houses, bridges, signposts, and even railroad trestles. In the USA, Eastern Kingbirds occasionally nest at the top of utility poles, and a study in British Columbia documented that 23% of nests of this species were on artificial structures.

Cavity-nesters such as the *Myiarchus* species frequently accept nestboxes, and also use hollow fence posts, old pumps, hanging buckets, pipes, and crevices in old buildings, while Streaked Flycatchers will also use nestboxes, as well as rain gutters, window sills and other crevices.

Nest form is extremely variable within the Tyrannidae. Acknowledgement that this variation provides important clues about evolutionary relationships within the family dates back to 1904, when von Ihering recognized several new subfamilies on the basis of their different nest structures, such as whether the nest was cup-shaped or pendent. As with other passerine families, including Furnariidae and Hirundinidae, among others, nest construction appears to be a relatively conservative life-history feature within lineages. Transitional stages are recognizable in some cases, suggesting evolutionary pathways between different stereotyped nest forms.

The commonest tyrannid nest type, taxonomically widespread and presumably primitive, is the open cup. The cup-nest takes on a wide variety of forms and is placed in many different kinds of physical sites, but its general structure is in all cases the same. The kingbirds build untidy nests of sticks, which they place high in trees, often in conspicuous spots in dead branches or snags over open water, thus inhibiting access by predators. At the opposite extreme, the Alder Flycatcher conceals its loose, untidy nest in dense foliage within a metre of the ground. The Eastern Wood-pewee and its *Contopus* congeners construct beautiful, carefully woven, tightly compact little cups with high edges, placed on open horizontal branches. All members of the genus *Elaenia* also build very neat open cups, but these are usually concealed in dense foliage; the Yellow-bellied Elaenia (*Elaenia flavogaster*) is a good example. The *Muscisaxicola* ground-tyrants and their relatives build open cup-nests directly on the



*The **Ash-throated Flycatcher** nests in cavities, a behavioural trait common to all* Myiarchus *flycatchers. While this usually means a hole in a tree, cavity-nesting refers to use of a host of natural or artificial sites that provide recessed protection, such as covered ledges or structural holes in buildings or machinery. They also use man-made nestboxes readily. Here, the chosen site is a woodpecker hole in a mature saguaro cactus* (Carnegiea gigantea). *This distinctive plant is common in the semi-deserts of the southern USA and northern Mexico, where this tyrant-flycatcher abounds. This cactus serves as a home for numerous cavity-nesting arid-country birds because of the enterprise of two woodpeckers (Picidae), the Gila Woodpecker* (Melanerpes uropygialis) *and the Northern Flicker* (Colaptes auratus). *Both of these species commonly excavate nests in the stems of columnar cacti.*

[*Myiarchus cinerascens cinerascens*, Arizona, USA. Photo: Dave Maslowski/ Maslowski Productions]



Most members of the genus Myiarchus *share one famous and intriguing habit: they adorn the nest with pieces of sloughed snake skin, animal hide, hair or plastic. These items are usually placed on the floor of the nest and wrapped about the interior of the nest. As demonstrated by this* ***Great-crested Flycatcher****, bits of snake skin are sometimes left dangling from the entrance. The definitive explanation for this behaviour has not yet been encountered, but it seems likely that the sight or odour of reptile skin dissuades predators from entering the dark cavity, as it could house a snake or some other hazardous tenant.*

[*Myiarchus crinitus*, Ohio, USA. Photo: Dave Maslowski/ Maslowski Productions]

ground, usually hidden among rocks. Many species in the subfamily Fluvicolinae construct cup-shaped nests on sheltered ledges of mossy banks, as typified by the Slaty-backed Chat-tyrant, on cliff faces, as does, for example, the Black Phoebe, and even on muddy riverbanks, as instanced by the Drab Water-tyrant. The Spectacled Tyrant weaves its cup-nest between reeds a metre above standing water in a marsh. One of the most distinctive cup-nests in the family is that of the Many-coloured Rush-tyrant, a tightly woven narrow cone of dried reeds attached all along one side to a single reed, and smoothed on the outside with a strange gum, giving the nest the appearance of having been cast in a mould like an ice-cream cone.

Nesting on cliff or mud ledges, riverbanks, rock crevices, and even directly on the ground has evolved independently in several lineages within the Tyrannidae, but apparently only within the Fluvicolinae. In all cases, these nests are modified open cups. Phoebes build large, tight nests of grasses and moss on ledges under protective overhangs. The somewhat looser grass cup of the Drab Water-tyrant is sited within a sheltered mud ledge on a riverbank, just one or two metres above the rushing water. The Chocolate-vented Tyrant in the monotypic genus *Neoxolmis* builds a shallow, open cup of dry grass and sticks, with a lining of feathers, directly on the ground in a sheltered location next to a grass tussock, shrub or rock. F. Vuilleumier analysed nest-site and clutch-size variation in 28 species of ground-tyrant and relatives. He concluded that open cup-nests in trees or shrubs are primitive for this assemblage, and that both ground-nesting habits and relatively small clutches, often of just two eggs, arose independently in the genera *Muscisaxicola* and *Neoxolmis* through separate invasions of semi-arid, resource-poor habitats in the Andes and in the Patagonian steppes, respectively.

In contrast to the above, the nest of the elaeniine genus *Corythopis*, the antpipits, is an oven-like, domed cup placed on the ground, with a side entrance. This nest is built with three different layers, comprising a cup, a lining and an outer covering, and is as unique among the Tyrannidae as are all the other features of these forest-floor flycatchers' ecology and life history (see Food and Feeding).

The partially domed cup built by the Mottle-cheeked Tyrannulet (*Phylloscartes ventralis*) seems to be an example of a transitional stage in the evolution of the fully domed nest. Covered, domed or ball-shaped nests with a side entrance appear in all three of the main tyrannid subfamilies and presumably evolved independently in each. Among the Elaeniinae, the two *Camptostoma* beardless tyrannulets build a messy, ovoid nest concealed in low vegetation or tucked into bromeliads or thick branches in a tree. In the Fluvicolinae, the Pied Water-tyrant and the closely related White-headed Marsh-tyrant construct loose globular nests of grass and feathers, which they attach to several reeds over standing water. In the third subfamily, Tyranninae, the Great Kiskadee builds a conspicuously bulky, ball-shaped nest of sticks and grass in a variety of locations, including low trees, dead snags and even utility poles. The similar nest of its relative, the Social Flycatcher, is made almost entirely of grass and placed



Tityras typically nest near the top of tall, dead snags in forested habitat, where they clearly benefit from the nesting activities of Melanerpes *woodpeckers by using abandoned holes. Here, a male* ***Masked Tityra*** *perches atop a broken stump in classic pose, while a female investigates a cavity in the trunk below, probably created by Yellow-tufted Woodpeckers* (M. cruentatus). *Both the woodpeckers and tityras are rather pugnacious birds, and it is common to see them bickering over nest-sites.* Melanerpes *family groups usually excavate several holes in a large dead tree, often creating enough room for both species. At times, groups of 3-4 adult tityras gather around suitable nest-sites, and it is possible that, as with the woodpeckers, they sometimes breed co-operatively. Further research is needed to clarify the breeding system of this interesting genus.*

[*Tityra semifasciata*, Alta Floresta, Mato Grosso, Brazil. Photo: Edson Endrigo]

in a huge variety of exposed locations, often over water. This species sometimes builds its messy grass nest inside natural cavities, suggesting an evolutionary precursor to the obligate cavity-nesting typical of some of its close relatives.

Cavity-nesting occurs in several groups of genera, mostly in the Tyranninae. The Sulphur-bellied Flycatcher and its congeners in *Myiodynastes* always nest in holes, as do all *Conopias* species for which relevant information is available. One of the latter, the White-ringed Flycatcher (*Conopias albovittatus*), usually uses tree holes, but it sometimes accepts the abandoned nest of a cacique as the most readily available "hole" in which to build. This behaviour, no doubt a response to the natural limitations in availability of tree cavities, clearly suggests a pathway towards the obligate nest piracy typical of the Piratic Flycatcher, discussed further below. All three species in the enigmatic genus *Tityra* nest in natural cavities, usually in old woodpecker holes quite high up in large dead snags.

Every species in the genus *Myiarchus* nests exclusively in natural or man-made cavities, such as woodpecker holes, knotholes in dead trees or limbs, tree-bark crevices and nestboxes. Hole-nesting also typifies all the genera in the *Myiarchus*-related assemblage, namely *Rhytipterna*, *Sirystes*, *Casiornis*, *Deltarhynchus*, *Ramphotrigon* and *Attila*. The *Myiarchus* flycatchers also share the peculiar habit of adding a piece of reptile skin, and often some animal hair or feathers, to the nest-lining. One of them, the Galapagos Flycatcher, suffers a shortage of holes, because no woodpeckers occur on those islands. This species, therefore, utilizes a variety of enclosed nest-sites, in addition to naturally occurring knotholes, and sometimes even uses the abandoned domed nests of several species of Galapagos finch. True to its lineage, the Galapagos Flycatcher adds hair and feathers to its nest, and this unusually confiding species has been photographed while attempting to retrieve human hair still attached to the person's head.

Members of the genus *Attila* display nesting behaviour that is transitional towards obligate cavity-nesting. The Bright-rumped Attila locates its bulky open cup-nest in a peculiar variety of natural crevices, such as the spot where a sapling grows adjacent to the sharply angled union of tree buttresses, or a deep nook amid masses of bromeliads. Other nests are built in shallow cavities of dead trees or knotholes, and the Grey-hooded Attila (*Attila rufus*) often chooses a hollow or a short tunnel in a clay riverbank in which to construct its bulky cup-nest.

The Long-tailed Tyrant is the only tyrant-flycatcher outside the Tyranninae to nest in holes. This fluvicoline species builds a thick mat of soft twigs and leaf petioles at the bottom of an old woodpecker hole or other natural crevice, almost always in a lone-standing dead tree and usually at a great height. Nest heights vary from 8 m to as high as 40 m above the ground. Only the female roosts in these holes, and she does so only immediately prior to and during incubation.

The most elaborate nests in the Tyrannidae are woven structures attached to and suspended by plant fibres from an overhanging twig. Most such nests are oblong or purse-shaped and have a somewhat concealed side entrance, sometimes protected by a short overhanging "visor". Pensile nests are typically lined with a thick mat of fine material such as seed down and soft feathers. In many cases, the nest is adorned with long "tails" of loose fibres or debris dangling below it, and such nests are often extraordinarily well camouflaged among debris, twigs or root banks, as is characteristic of, for example, those of the Spotted Tody-flycatcher. Elongated, pendent nests appear to be a universal trait among the pygmy-tyrants, tody-tyrants and tody-flycatchers, and have been documented for, among others, the Hangnest Tody-tyrant (*Hemitriccus nidipendulus*) and the Buff-throated Tody-tyrant (*Hemitriccus rufigularis*). Tody-flycatchers sometimes place these structures near active nests of paper wasps. The pendent nests built by the Sulphur-rumped Flycatcher (*Myiobius sulphureipygius*) and all other members of its genus are rounded and tightly woven, broader than those of the tody-tyrants, and are protected above by a steeply angled layer of twigs that overhang on all sides, forming a canopy with "eaves". These pyramid-shaped structures are less camouflaged than are other pensile-type nests, and instead are protected by being suspended at the high central point, from the end of long, vertically hanging twigs, vines or bamboo fronds, often over a stream.

Members of the genera *Mionectes* and *Leptopogon* often build a remarkably long, pendent nest with a tightly constructed, enclosed chamber having a roofed side entrance. These nests are camouflaged with a variety of liverworts, mosses, vine tendrils and grass, producing an irregular, messy-looking exterior that resembles flotsam left by receding floodwaters. Indeed, they



*The **White-rumped Monjita** does not dig its own holes, but relies instead on the excavations and constructions of other birds. The species is a cavity-nester with a predilection for open, sometimes almost treeless landscapes in the* cerrado *region of Brazil, and it often uses the abandoned burrows of Campo Flickers* (Colaptes campestris) *and Orange-fronted Parakeets* (Aratinga canicularis). *Both of these species frequently breed in termite mounds and ant hills, and, as shown here, the monjita is willing to do the same. Some individuals have been found nesting in the antechamber of thornbird* (Phacellodomus) *nests, which are huge, bulky pikes of sticks placed midway up in trees.*

[*Xolmis velatus*, Minas Gerais, Brazil. Photo: Anita Studer]



The nests of most tyrant-flycatchers are loosely woven, often constructed with grass, moss, and fine tendrils, and with relatively little use of stiff twigs or sticks. The nest of this ***Yellow Tyrannulet*** *is a typical example of the open-cup variety, and its architect is a widespread but local bird of dense tangled undergrowth, bamboo and vine tangles in the tropical lowlands of Central and South America. For a brief time included in the genus* Phylloscartes, *it is now generally separated in its own genus, as previously. It is possibly related to* Inezia, *which it more closely resembles in behaviour and vocalizations. Evidence from DNA studies is required to clarify its position.*

[*Capsiempis flaveola flaveola*, Alagoas, Brazil. Photo: Anita Studer]

are usually suspended from the tips of narrow, vertically hanging branches or rootlets under a protective ledge or fallen tree trunk within a ravine, and may even be placed over rushing, rocky streams. The most dramatic nest in the Tyrannidae, however, is that of *Onychorhynchus*, the Royal Flycatcher, the elaborately camouflaged hanging structure of which can approach 2 m in length.

Flatbills in the genera *Tolmomyias* and *Rhynchocyclus* construct pendent nests that are tightly woven with black vine tendrils and fungal hyphae. The nest shape is that of a retort, with a ball-like main pouch, and a woven tube descending at an angle from the top to form a side entrance. Both these genera often place their nests 10-20 m above the ground, hanging from an outermost branch of an exposed tree, in close proximity to an active wasp nest.

No discussion of the nesting habits of the Tyrannidae, however brief, would be complete without mention of the Piratic Flycatcher. This species is an obligate nest pirate, a trait that is almost unique among the tyrant-flycatchers; on rare occasions, the Great Kiskadee also engages in nest piracy. Piratic Flycatchers breed at the edge of tropical-forest openings, such as lake or river margins, open swamp or palm forests, and man-made clearings. At



The ***Crested Black-tyrant*** *builds an open cup-nest in the shady recesses of rocky banks, tending to choose sites that are well shielded from the sky. This photograph is brightly lit with flash, making the incubating bird unusually conspicuous, but it is usually very difficult to make out in the dimly lit interior of caverns. Unlike most other species in the genus* Knipolegus, *females of this species are almost as black as the males. It is not known why a few species are monomorphic, in this otherwise sexually dimorphic group, but in one other species the male has converged into female-like brown plumage.*

[*Knipolegus lophotes*, Minas Gerais, Brazil. Photo: Anita Studer]



*The messy cup-shaped nest of the **Fork-tailed Flycatcher** is sometimes built near the end of a branch, where it can be shaken loose in high winds. This incubating adult shows the yellow coronal patch typical of kingbirds; at most viewing angles these patches are difficult to see, but they are exposed and displayed to partners during courtship bouts. The female takes sole responsibility for incubation in this species.*

[*Tyrannus savana savana*, Minas Gerais, Brazil. Photo: Anita Studer]

the start of the breeding season, pairs perch high on a treetop for hours on end, incessantly calling a high-pitched "pee-de-de-de", and watch for other bird species to begin the construction of their nests. Piratic Flycatchers have been recorded as usurping the nests of a wide variety of species, and the nest types involved are similarly varied, although mostly of a bulky nature and, typically, with either a side entrance or a semi-concealed top entrance. Among them are pendent nests with side entrances, such as those of the flatbill genera *Tolmomyias* and *Rhynchocyclus*, the open-topped hanging nests of various icterid species in the genera *Icterus*, *Psarocolius* and *Cacicus*, the globular stick or grass nests with side entrances of, among others, several *Myiozetetes* species and *Pachyramphus* becards, and even large wasp or termite nests that have been hollowed out for nesting by trogons (Trogonidae). The Piratic Flycatcher carries out increasingly persistent, merciless harassing of the original owners, with dive-bombing flights and visits to the nest entrance. Both members of the pair take part in these relentless raids, which usually commence just as the nest is completed. The victims may put up considerable defence, but give up within one or two days. Occasionally, the flycatchers begin their harassment after incubation has begun, in which case they remove the eggs during the process of taking over the nest.

Among tyrannids in general, the female takes the most active role in nest construction, and often builds the nest with no assistance from her mate. Furthermore, for all well-studied species, females alone undertake the duty of incubation of the eggs. Clutch sizes vary from two to six eggs, with most tropical species laying only two to four eggs. The laying interval is daily for some species, such as the *Tyrannus* kingbirds, but many tropical species lay on alternate days. The incubation period varies from 12 days to 16 days among most species in both North and South America, reaching a peak of 23 days among a few of the smaller Central and South American species that build hanging nests.

Nestlings are brooded exclusively by the female, and they are usually provisioned by both sexes, the male playing a more active role. The Royal Flycatcher is an odd exception in that the male appears not to bring any food to the nest, even though he is present in a nest-guarding capacity throughout the nesting cycle. The chicks remain in the nest for periods varying from 12 days to 24 days, the period for the majority of the family falling in the range 14-17 days; in one exceptional case, a nestling period of 28 days was recorded for the Eye-ringed Flatbill. Young tyrannids can leave the nest in an explosive manner if the nest is disturbed prior to the natural fledging period. Nestling Eastern Phoebes, for example, can, if necessary, make relatively strong flights away from the nest only 15 days after hatching. Fledglings remain hidden in vegetation, but often emit loud begging calls. The fledged young of many tyrannid species roost together in a row, often in physical contact with one another on the branch.

Juveniles frequently spend many months living with their parents, and three individual Cliff Flycatchers were observed to be attending a single nest in Argentina. Despite that observation, however, no tyrant-flycatcher is known to exhibit co-operative breeding on a regular basis. Instead, among non-migratory tyrannids, the offspring of breeding pairs typically disperse immediately prior to the next breeding season.

Tyrant-flycatcher nests are not uncommonly preyed upon. The general rule in such cases is for the adults to renest. In a study of Social Flycatchers breeding along a lake margin in south-eastern Peru, one pair made six consecutive nesting attempts between September and January before it succeeded in fledging any young.

Movements

Tyrannidae constitutes by far the most mobile group of suboscine passerines. Almost a third of all tyrant-flycatchers engage in some form of movement between breeding and non-breeding grounds, consisting mainly of migration towards tropical or equatorial latitudes during northern and austral winters and returning in the opposite direction in the corresponding spring. In North America, all species that breed north of the USA-Mexico border migrate southwards in August or September and return between March and early May. Most migrate to Central or South America, leaving only the phoebes and scattered individuals of a few other species wintering within the southern USA. In South America, all species that breed in areas south from central Argentina migrate northwards during April-June and return from August to September. Even within tropical latitudes a few species make

seasonal movements. The Piratic Flycatcher, for example, leaves Central America in October and appears to begin breeding in the southern Amazon shortly thereafter. It is possible that individuals of this species breed at both ends of their range.

In terms of the geography of their wintering grounds, tyrant-flycatchers that breed in North America can be divided into two groups. Almost every species that breeds in the montane, semi-arid or lowland grassland habitats of western North America winters in Middle America, from mid-Mexico south to Panama, and extreme northern Colombia. These species reach peak winter-time abundance from southern Mexico through to Costa Rica. In contrast, those breeding in the deciduous forests east of the Great Plains or in coniferous and alder-shrub habitats across boreal Canada tend to migrate across the Gulf of Mexico to winter grounds in South America. These species reach peak winter-time abundance in western Amazonia and along the eastern base of the Andes. Within the southernmost states of the USA, the Eastern Phoebe is the only common wintering tyrannid east of the Great Plains, and the Black Phoebe is its replacement in the south-west. Southern Florida also captures a few additional species in extremely low numbers, including a small population of Great Crested Flycatchers and scattered individuals of the Vermilion Flycatcher, the Western Kingbird and the Scissor-tailed Flycatcher.

Two closely related *Empidonax* species that are sympatric over a broad zone in eastern North America divide their tropical wintering grounds in non-overlapping ranges. The Willow Flycatcher, which is the more southerly and westerly of the two, winters exclusively in Central America. The Alder Flycatcher, breeding across the boreal zone of Canada and northern USA, establishes wintering territories from September to April in the riparian thickets of the western Amazon Basin.

An exception to this pattern is the Sulphur-bellied Flycatcher, which breeds in the riparian forests of Mexico north to the USA border. Although it does, like the rest of the western flycatchers, migrate southwards through Central America, this species continues to South America and winters in loose aggregations of up to ten individuals in the western Amazon Basin. There, it is often found eating fruit in *Cecropia* stands and other river-edge habitats. Within the Amazon Basin, Sulphur-bellied Flycatcher alternates temporally with the closely related Streaked Flycatcher, an austral migrant.

The Eastern Kingbird has the most extensive migration of any tyrant-flycatcher. It breeds as far north as Alaska and northern Canada, and the entire population spends the winter south of the equator, from western Amazonia south to Argentina. On migration and throughout its South American non-breeding grounds, the Eastern Kingbird's behaviour would confuse those who know it only in summer. From May to July the species breeds as territorial, monogamous pairs in open country with scattered trees, and forages almost exclusively from exposed perches, from which it sallies after flying insects. In August, adults and juveniles begin to assemble in loose flocks of up to a few dozen individuals. Then, between mid-August and mid-September, flocks containing up to several hundred individuals move southwards on nocturnal migration. Often, these large flocks are visible at dusk or in early morning along the southern coast of the USA, over western Cuba and over eastern Mexico. By October they reach the Amazon Basin, where they appear to be nomadic, descending on large fruiting trees and remaining for days at a time, before gathering together and disappearing over the treetops to find fruit elsewhere. In these circumstances, the Eastern Kingbird is individually subordinate to its large, resident tropical relatives, but it overwhelms them by travelling in such large flocks. Many of these flocks reach southern Brazil and Argentina, before turning back northwards. Early arrivals are seen by March in the southern USA.

Tyrant-flycatchers are the dominant group of birds that migrate northwards from temperate or subtropical latitudes during the southern winter. Many members of the Fluvicolinae and the Tyranninae move north out of the southernmost portion of their breeding areas to populate the more northerly parts in Bolivia, Paraguay, southern Brazil and northern Argentina. Some species breeding in central Patagonia, such as the Austral Negrito, the Chocolate-vented Tyrant and the Rusty-backed Monjita (*Xolmis rubetra*), retreat northwards from their southernmost nesting grounds only as far as the central *pampas*. Some of the most southerly breeders, such as the Lesser Shrike-tyrant (*Agriornis murinus*) and the Cinnamon-bellied Ground-tyrant (*Muscisaxicola capistratus*), leave their breeding grounds en-



Even after the eggs have hatched, female tyrant-flycatchers continue to brood the nestlings for much of the day and at night. This is especially important during tropical downpours, when chicks can die from exposure and heat loss, if they are allowed to get wet. This ***Yellow-bellied Elaenia*** *protects her brood from the rain. Like most elaenias, she builds a tidy cup-shaped nest on top of a branch, and weaves pieces of lichen into the outer wall for camouflage.*

[*Elaenia flavogaster flavogaster*, Matoury, French Guiana. Photo: Tanguy Deville & Olivier Tostain/EcoBios]

tirely and move north to the equator or beyond for the non-breeding period. The southerly, nominate race of the Grey-bellied Shrike-tyrant (*Agriornis micropterus*) migrates northwards throughout the rest of Patagonia, but the northern race, *andecola*, appears to be non-migratory. Many of the ground-tyrants breed in the lowlands of southern Patagonia but spend the non-breeding season mainly high in the Andes of northern Argentina, Bolivia and Peru.

A number of southern breeders migrate to the Amazon forests. The southern races of both Swainson's Flycatcher (*Myiarchus swainsoni*) and the Streaked Flycatcher are present in the off-season throughout the Amazon Basin, where they overlap resident races from May to September, but they feed mainly in fruiting trees along clearings and edges. The Large Elaenia (*Elaenia spectabilis*) breeds from northern Argentina across southern Brazil, and winters in open river-edge habitats throughout the southern Amazon Basin. Similarly, the tiny Plain Tyrannulet (*Inezia inornata*) migrates northwards from open shrubland habitats in Bolivia and Paraguay and spends the non-breeding months in *Tessaria*-dominated early-successional growth along river margins in the south-western part of the Amazon Basin. During the austral winter, southern-breeding races of the Vermilion Flycatcher establish small, semi-permanent feeding territories along brushy margins of lakes and rivers in western Amazonia, and the Crowned Slaty Flycatcher, an open-country breeder, migrates north to exploit tall exposed treetops throughout Amazonia. This huge, productive region is the non-breeding home of yet another tyrannid, the Black-backed Water-tyrant, the southernmost populations of which move out of Argentina and take up residence along lakeshores and marshes in western Amazonia.

Long-distance movements are undertaken not only by the Nearctic tyrannids, but also by some of the austral migrants. The Small-billed Elaenia (*Elaenia parvirostris*) moves from the woodlands of Bolivia, Argentina and southern Brazil to a variety of open woodland and shrub habitats as far north as northern Colombia, coastal Venezuela and Trinidad. Equally remarkable is the Fork-tailed Flycatcher, the abundant southern race of which migrates in large flocks northwards as far as the Caribbean, and "overshooting" individuals are seen occasionally between March and September as far north as eastern North America. Similar instances of vagrancy are known for the Variegated Flycatcher, which moves from open country in southern Brazil and Argentina northwards to the *llanos* of Venezuela; extralimital records of this species have been made as far north as coastal Maine, in the USA.

Despite their seemingly weak, wren-like flight capabilities, marsh-breeding flycatchers such as the Many-coloured Rush-tyrant and the doraditos engage in extensive movements during the non-breeding season. The former moves northwards out of the southernmost areas of its range in south-eastern Argentina, and one was even recorded 170 km out to sea off the Rio Grande do Sul coast of south-east Brazil. The precise migratory status and distribution of the doraditos remain unclear. The Warbling Doradito (*Pseudocolopteryx flaviventris*) migrates northwards from southernmost Patagonia to extreme northern Argentina and Paraguay. The Subtropical Doradito (*Pseudocolopteryx acutipennis*) breeds in reedbeds and sedges high in the Andes, and then moves down to lowland marshes from May to early December; in Bolivia, for instance, it breeds at 2200-3550 m, but has not been recorded above 700 m during the austral winter. The rare Dinelli's Doradito (*Pseudocolopteryx dinelliana*) nests in a small area of northern Argentina, but in the non-breeding season it is found 500 km to the north, in southern Bolivia and western Paraguay.

Several mysteries remain with regard to the exact non-breeding, as opposed to breeding, distributions of South American tyrant-flycatchers. A number of *Knipolegus* species, such as the White-winged Black-tyrant, move either in elevation or in latitude between breeding and non-breeding seasons, but the precise limits of these movements are unclear. Likewise, the winter movements of many *Elaenia* species through the Amazon are poorly documented, in part because these birds become inconspicuous and difficult to identify in the forest treetops outside the breeding season.

A few tyrant-flycatchers are altitudinal migrants, descending to lower-elevation zones during the non-breeding season. Champion among these is the White-crested Elaenia, the southernmost race of which, *chilensis*, is an abundant breeder in *Nothophagus* forests of Chile and Argentina and winters broadly across the lowlands of the Amazon Basin, eastern Bra-



*Excessive solar radiation is almost as perilous for young birds as rain and cold. This **Eastern Kingbird** is shielding her brood from the sun's rays, an important defence against dehydration and overheating in the open habitats where this species nests. Here, the afternoon was sultry enough to cause the whole family to gape, a posture that helps lower blood temperature by evaporative cooling in the mouth and throat. Males in this species are not always the fathers of the offspring in their nest, as a result of extra-pair matings. Interestingly, conspecific brood parasitism is rife in some populations, so in some cases not even the female can be sure she is raising her own young.*

[*Tyrannus tyrannus*, New York, USA. Photo: Marie Read]



*Only a small proportion of the tyrant-flycatchers have been studied in great detail. For example, the breeding behaviour of the **Warbling Doradito** is almost unknown. This parent is removing a faecal sac from the cloaca of a young nestling. This species, like most other passerines, probably eats these packets very early in the nestlings' life, when their low digestive efficiency leaves many nutrients in the faeces. Later, adults dispose of these packets of waste material some distance from the nest, thereby ensuring that nest hygiene is maintained and that the nest itself is not made conspicuous by droppings.*

[*Pseudocolopteryx flaviventris*,
Depresión del Salado,
Buenos Aires, Argentina.
Photo: Yves Bilat]

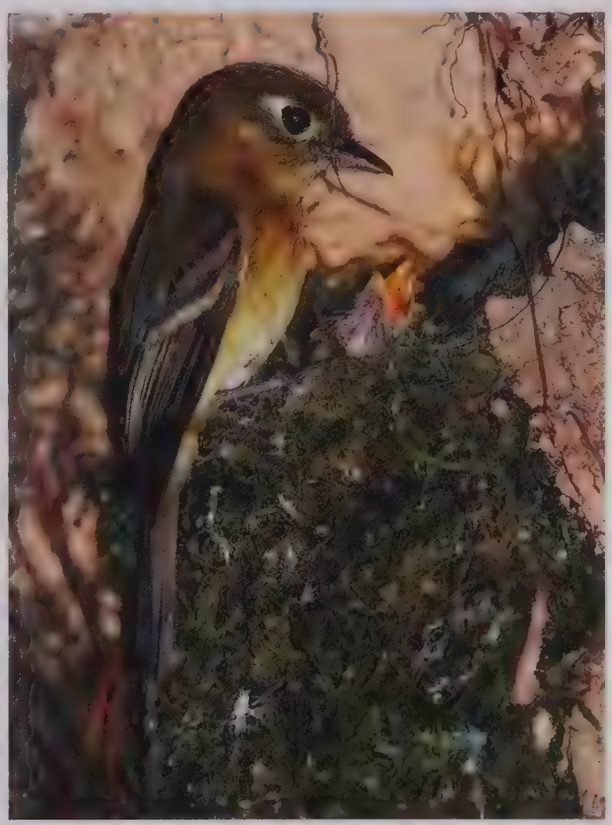
zil, Paraguay, Uruguay and Argentina. Another example is that of the White-bellied Tyrannulet, which breeds along the Andean foothills of Argentina up to as high as 3000 m, and then spends the May-September off-season across the low-lying parts of the northern half of the country.

It is hypothesized that the Piratic Flycatcher may breed at both ends of its migratory route. This species breeds from south-eastern Mexico south to Panama, but it is present in the northern part of this range only from March to August, and in Panama from January to September. It also breeds widely in South America, but the population breeding in the western Amazon Basin is present only from August to March or April. The fact that the Piratic Flycatcher is an extensively frugivorous species (see Food and Feeding) may make it energetically possible for it to raise a brood at each end of a migratory route, as has been demonstrated in North America for another fruit-eating and aerial-hawking bird, the Phainopepla (*Phainopepla nitens*).

The historical biogeographical importance of long-distance migration in the Tyrannidae bears mention. During the tens of millions of years during which North America was isolated from South America, only a single endemic bird family, the species-poor waxwings (Bombycillidae), consisted of sallying insectivores. Ecological opportunities therefore existed across North America for a radiation of birds that could exploit both flying insects and stationary arthropods accessible only to a sallying bird. The Tyrannidae constituted such a group, and the fact that many South American species engaged in continent-scale seasonal migrations presumably supplied a mechanism for colonizing the North American continent in the epochs preceding the creation of the Central American land-bridge. Of course, tropical birds invading the North American forests and grasslands faced snow-bound, leafless habitats devoid of active insects or other food for half of the year. For any such invading group to be successful, therefore, the colonizing species would have to have the propensity to head back south for the winter. It is presumably through this sequence of events and conditions that a few flycatchers in the highly migratory subfamilies Fluvicolinae and Tyranninae, including *Empidonax*, *Contopus* and *Sayornis* precursors in the former and *Tyrannus* and *Myiarchus* in the latter, were able to colonize North America and eventually to diversify in the continent.

Relationship with Man

Tyrant-flycatchers appear to have had little impact on human thinking. They are almost certainly best known to people by their vocalizations, although in many cases these are far from striking. Indeed, it is likely that a great number of the Tyrannidae have no effect whatsoever on humans. On the other hand, these birds are reasonably well accepted throughout much of their ranges, not least because they are often associated with human habitations.



In common with many other members of the genus Empidonax, *the **Yellowish Flycatcher** builds a bulky open cup of moss and liverworts, interlaced with a few fibrous rootlets, hairs, or other thin building materials. It usually tucks this structure into fissures or recesses in banks, tree-trunks and the like. The normal clutch consists of 2-3 eggs and incubation is performed entirely by the female.*

[*Empidonax flavescens flavescens*,
San Gerardo, Dota,
Costa Rica.
Photo: Marco Saborío]



In general, female tyrant-flycatchers are more actively involved than males in the breeding cycle, not only in producing eggs and contributing time to incubation, but also in providing for the nestlings. From what is known, the genus Pachyramphus *seems to fit this pattern quite neatly, as illustrated by this female* ***White-winged Becard*** *carrying a beakful of food for her offspring. As with so many of the true tyrannids, relatively little is known about the breeding behaviour of becards.*

[*Pachyramphus polychopterus polychopterus*, Alagoas, Brazil. Photo: Anita Studer]

As mentioned previously, the Great Kiskadee is the most vocally raucous member of the family. Its loud call is so familiar throughout most of the species' huge range that it has attracted a number of colloquial names. The well-known "kis-ka-dee" has been translated by various cultures into "Cristo-rey" (Christ the King), "Cristo-fue" (Christ has gone) and "Bem-ti-vi", the last version, meaning "saw you well", representing a Brazilian legend about the watchful kiskadee befouling a runaway thief.

Likewise, the ringing trill of the Scale-crested Pygmy-tyrant in the Central American and Andean montane forest is so distinctive that this species is sometimes referred to by local inhabitants as the "police-whistle bird".

The Royal Flycatcher's eye-catching display, with its remarkable crest raised and fanned and the head rhythmically twisted (see General Habits), has been witnessed only rarely in the wild. Nevertheless, it is considered so remarkable that it has not only been depicted in books but also featured on South American postage stamps.

Because many tyrant-flycatchers live in open habitats or at the edges of forest, and many seek exposed, elevated perches while foraging, members of this family are predisposed to associating with man-modified habitats and dwellings. A few species can even be termed "commensal" with humans, as they seem to favour and seek out certain conditions supplied by man over those in more natural habitats.

In North America, the phoebes, in particular, frequently utilize man-made structures for nesting (see Breeding). In this way they provide a welcome addition to the human environment. Indeed, so closely related to man-made structures are members of this genus that the great American poet Robert Frost ended a lovely poem, entitled *The Need of Being Versed in Country Things*, with the following verse, referring to birds still living around a recently burned farmhouse:

> For them there was really nothing sad.
> But though they rejoiced in the house they kept,
> One had to be versed in country things
> Not to believe the phoebes wept.

So far as is known, no member of the tyrant-flycatcher family has any adverse influence on human activities or interests.

Status and Conservation

The conservation problems facing bird populations in the Americas are well described in many of the field guides and monographs covering the region, as well as in other standard treatises such as *Threatened Birds of the World*, published by BirdLife International in 2000. Several other important compilations by this organization deal specifically with the Americas.

After Fringillidae and Psittacidae, Tyrannidae is the avian family with the highest number of threatened species in the New World. Of the total of 429 tyrannids, 47 species, or 11%, are currently considered to be of conservation concern. Two of these are categorized as Critical, nine as Endangered and 13 as Vulnerable, with a further 23 in the category of Near-threatened. Almost half of these are found exclusively or partly in Brazil, 13 of the total being restricted to that country and an additional nine occurring both in Brazil and in one or more of the adjacent countries of Bolivia, Paraguay, Uruguay and Argentina. Three of the 47 are endemic in Venezuela, two in each of Colombia, Peru and Argentina, and one each in Cuba, on Cocos Island, off Costa Rica, and on Robinson Crusoe Island, off Chile. A further three species are confined to Central America, and one occurs in Panama and Colombia, five in Ecuador and Peru, two in Peru and Bolivia, and two in several South American countries.

The above figures reflect the pattern of habitat destruction that has taken place in the New World, as illustrated by N. J. Collar and his collaborators. The destruction of the Atlantic coastal forests of Brazil, including humid forest, semi-deciduous forest, *restinga* and scrub, is the main reason for the high number of threatened species in Brazil. Similarly, the rapid conversion of native South American grassland and savanna into pastures and agricultural land is reflected by the fact that five of the tyrant-flycatcher species at risk occur in these habitats. Other regions facing rapid habitat destruction are Andean forests and scrub, and the lowland forests of the Tumbesian region of western Ecuador and Peru. Indeed, forest and scrubland habitats in many parts of Middle and South America are under threat, and these are the very habitats that harbour many of the members of this family. Nearly half of all globally threatened and Near-threatened tyrannids are usually found below 1000 m elevation, most of them inhabiting lowland forests, with only four and two spe-



*The **Streaked Flycatcher** is a common and conspicuous species throughout its large range in South America. It is somewhat kiskadee-like in shape and temperament, but has very different nesting behaviour. On rare occasions, clutches are laid in sheltered spots, such as the crotch of a palm tree, but usually they are placed in natural cavities such as the one shown here. The ideal site is a hole quite high in a tree or a broken-off stump, preferably in a clearing, or in parklike habitat. This species readily takes to old woodpecker holes, and in some regions it is a regular occupant of man-made structures, nesting in eaves or under broken roof tiles. In all these situations there is no nest as such; merely a scatter of twigs and other assorted items.*

[*Myiodynastes maculatus solitarius*, Minas Gerais, Brazil. Photo: Anita Studer]

cies having been recorded above elevations of, respectively, 3000 m and 4000 m.

Of three island species, two are classified as Vulnerable. These are the Cocos Flycatcher, restricted to the island of that name lying about 500 km off the Pacific coast of Costa Rica, and the Noronha Elaenia (*Elaenia ridleyana*), which lives on the Fernando de Noronha Archipelago, off north-east Brazil. The third, the Juan Fernandez Tit-tyrant (*Anairetes fernandezianus*), is confined to Robinson Crusoe Island, off Chile, and is Near-threatened.

Taxonomically, *Phylloscartes* contains the highest numbers of tyrannids considered to be in trouble. Of its 16 species, five are globally threatened and a further three are considered Near-threatened. Again, the main reason is the destruction of the Atlantic coastal forests, where six of these eight species live. Two of them, the Alagoas Tyrannulet (*Phylloscartes ceciliae*) and the Minas Gerais Tyrannulet (*Phylloscartes roquettei*), are the only tyrannids placed in the highest of threat categories, that of Critical. The related genus *Pogonotriccus*, previously lumped with *Phylloscartes* (see Systematics), is also of concern, with two of its seven members listed as Near-threatened and one as Endangered.

Fortunately, so far as is known, no tyrannid has yet become extinct, but the first two casualties may soon be the two Brazilian tyrannulets mentioned in the preceding paragraph. Both also epitomize the typical threats that face tyrant-flycatcher species. In Alagoas state, where the Alagoas Tyrannulet was discovered in 1983, massive clearance of the humid forests around Murici, largely for sugar-cane plantations and pastureland, has reduced this habitat to a mere 2% of its original cover, which extended through both Pernambuco and Alagoas. Even remaining forest tracts are threatened by small-scale cultivation, by timber and firewood removal, and by the spreading of fires from adjacent plantations. Only recently has the last forest remnant, of about 30 km², received some protection within the Murici Ecological Reserve, but the establishment of this reserve has not halted forest degradation and destruction, because these privately owned forests continue to be used for selective logging and are still threatened by the spread of fires. The best areas of surviving forest now lie almost exclusively within a privately managed reserve known as Fazenda Bananeira, covering 12 km². The Alagoas Tyrannulet has been found in two additional reserves, but these are also no more than tiny remnants of the vast forest that once extended along almost the entire Atlantic coastline of Brazil.

The semi-deciduous forests inhabited by the Minas Gerais Tyrannulet have experienced a similar fate to that described above. They represent probably the most threatened habitat in central Brazil owing to their valuable timber and their relatively fertile soils. The tyrannulet may already be extinct at its type locality in Minas Gerais, where the gallery forests on both banks of the São Francisco River have been extensively removed for timber and charcoal, limestone-quarrying, pasture and the cultivation of soya beans and other agricultural produce. The occurrence of the species in a newly established national park is a source of some optimism, although the size of this population must urgently be determined. Luckily, the species has been found at two additional localities to the south, where patches of forest remain, but a major irrigation project is under way that has already led to the deforestation of large areas; unless these extremely small sites are effectively protected or further populations are found, there must be a grave risk that this species will very shortly become extinct.

This tale of rapid habitat destruction leading to increasingly small populations living in fragmented remnants of what used to be large and continuous habitats is repeated for almost every one of the 24 globally threatened tyrannids and the 23 Near-threatened ones. Tyrant-flycatchers are too small to be considered worthy of hunting, and are not targeted for commercial exploitation as cagebirds. Rather, the primary threat for virtually all tyrannids is habitat destruction, while a few species are also adversely affected by tourism, introduced predators, herbivores and competitors, and nest parasitism by cowbirds (*Molothrus*, *Agelaioides*).

Degradation, fragmentation and destruction of forest habitats top the list of threats, with the conversion of native grassland and savanna into pastureland and agricultural areas the second most important factor. Destruction of scrubby and marshy habitats also places some flycatcher species at risk. Forest habi-



*As with all becards, the nest of the **Chestnut-crowned Becard** is a distinctive bulky structure built of twigs, moss and leaves. These messy globular nests are often placed in the canopy or middle storey of isolated trees, or trees at forest edge. Becards either suspend these nests from an overhanging branch or, more commonly, wedge them into a fork between branches. The side entrance usually faces downwards, thus providing shelter and camouflage, and the incubation chamber itself is positioned near the top of the structure. The clear preference for isolated trees in many becards is an adaptation to keep the nest away from the customary foraging areas of arboreal mammals and reptiles.*

[*Pachyramphus castaneus castaneus*, Atlantic forest, SE Brazil. Photo: Luiz Claudio Marigo]



*This **Short-tailed Pygmy-tyrant** is arriving at its nest with a beakful of insects. An obligate insectivore, it must work hard to provision its brood, visiting the chicks every few minutes throughout the day. Weighing only 5 g, this species and its congener the Black-capped Pygmy-tyrant* (Myiornis atricapillus) *are the smallest passerines in the world, with tails so short as to seem vestigial. Its wings are also short and rounded, like those of cicadas or beetles, and this bird almost looks beetle-like when it whirrs weakly from perch to perch in the middle storey. These chicks have begun begging before the arrival of the adult at the nest, and it seems plausible that the distinctive whirr of wings approaching may alert them to the imminent arrival of food. The pendant nest is typical of all species in the tody-tyrant and pygmy-tyrant assemblage.*

[*Myiornis ecaudatus ecaudatus*,
Reserva Extrativista de Pedras Negras,
River Guaporé,
Roraima, Brazil.
Photo: Dante Buzzetti]

tats become degraded through selective logging for timber, firewood and charcoal, understorey disturbance caused by timber extraction and livestock grazing, small-scale cultivation, the spread of fires from adjacent areas, and soil erosion in the wake of these activities and occurrences. Wholesale clearance of forests is largely a result of the desire to create pastureland for livestock farming and plantations for various commercially exploitable products, such as pine and eucalypt (*Eucalyptus*) trees, mangos, bananas and other fruits, sugar cane, soya beans, marijuana, coca and coffee, the last of those at least providing habitat for some birds in the form of coffee shade trees. Generally, forests on fertile soils are the first to be cleared, but more and more of those on marginal soils are also being converted. Forest destruction is also frequently the outcome of oil extraction, mining, irrigation projects, urbanization, and infrastucture developments such as road-building. Road-building is especially destructive, not so much in terms of the size of the area lost, but because it fragments previously continuous habitats and opens them up to human intrusion and, as a consequence, further environmental damage.

In some areas, deforestation has been so intense that virtually all pristine forest outside protected areas will very soon be destroyed. This is the case with, for example, the Atlantic Forest of coastal Brazil, the lowlands forests in the Tumbesian region of western Ecuador and north-west Peru, and the lowland forest in Chiriquí, in Panama. Unprotected patches of intact forest remain only on inaccessible slopes at higher elevations, and are usually rather small and severely fragmented. Worse still, even formally protected areas often suffer from human impacts, especially when protection cannot be enforced for lack of human and financial resources. Many reserves suffer from selective logging, understorey disturbance through livestock grazing, illegal settlements and small-scale cultivation, and illegal fires. Moreover, they are sometimes subjected to wholesale conversion to pasture and plantations, this being especially the case in areas of armed conflict, where coca production is widespread.

A good example of the problem can be seen in eastern Brazil, where a string of parks and reserves stretches from southern Bahia south to Rio Grande do Sul, affording protection for many of that country's threatened bird species, including tyrannids. Many of these reserves, however, are small and isolated, rendering their bird populations vulnerable to "edge effects" and "island effects", which may reduce immigration and gene flow and, at the same time, increase inbreeding depression, as well as predation and cowbird parasitism. Furthermore, most of these reserves, especially the larger ones, protect mainly montane habitats, whereas the lowland forests are given only minimal protection.

The threats facing native grasslands and savannas in South America are very similar, with conversion for pasture and plantations being the main one, but most of the other factors mentioned above also play a role. For example, two-thirds of the *cerrado* region in central Brazil had been heavily or moderately altered by 1993, with much habitat conversion having been actively encouraged by government land-reform policies since the 1950s.

With very few exceptions, tourism and introduced predators, herbivores and competitors affect only island species. Tourism has had a strong impact on habitats in the Caribbean, especially on the smaller islands such as the Lesser Antilles, where loss of habitat has been most severe on islands with no inaccessible mountainous areas. The Lesser Antillean Pewee (*Contopus latirostris*), the Grenada Flycatcher (*Myiarchus nugator*) and the Lesser Antillean Flycatcher (*Myiarchus oberi*) have certainly suffered from the large-scale destruction of native forests, although none of them is considered yet to be at any risk. Away from the West Indies, two other island species, the Noronha Elaenia and the Cocos Flycatcher, are already globally threatened, and both may be put under even more pressure by future increases in tourism. In a similar context, the continuing development of beach-front dwellings is destroying the *restinga* forests inhabited by the Restinga Tyrannulet (*Phylloscartes kronei*) in south-eastern Brazil, and this tyrannid, too, is globally threatened.

Introduced mammalian predators such as coatis (Procyonidae), cats and rats (*Ratus*) may adversely affect the Cocos Flycatcher, the Juan Fernandez Tit-tyrant, the Noronha Elaenia and



The most common brood size in tropical tyrannids is two eggs, with a few species even laying only one egg during most breeding attempts. Some tropical species lay up to four eggs, and a few Nearctic species will lay up to six. This ***Boat-billed Flycatcher*** *is raising two chicks, one of which is receiving a large insect that it will work hard to swallow. With the biggest bill of any tyrant-flycatcher, this species snatches bulky prey items, such as reptiles, amphibians, orthopterans and moths, from leaves and branches. Unlike the similar Great Kiskadee* (Pitangus sulphuratus) *it builds an open nest, untidily constructed on top of forked or intersecting branches, and it announces its identity, not with strident yelling, but with coarse, nagging calls from the treetops.*

[*Megarynchus pitangua pitangua*, Maranhão, Brazil. Photo: Anita Studer]

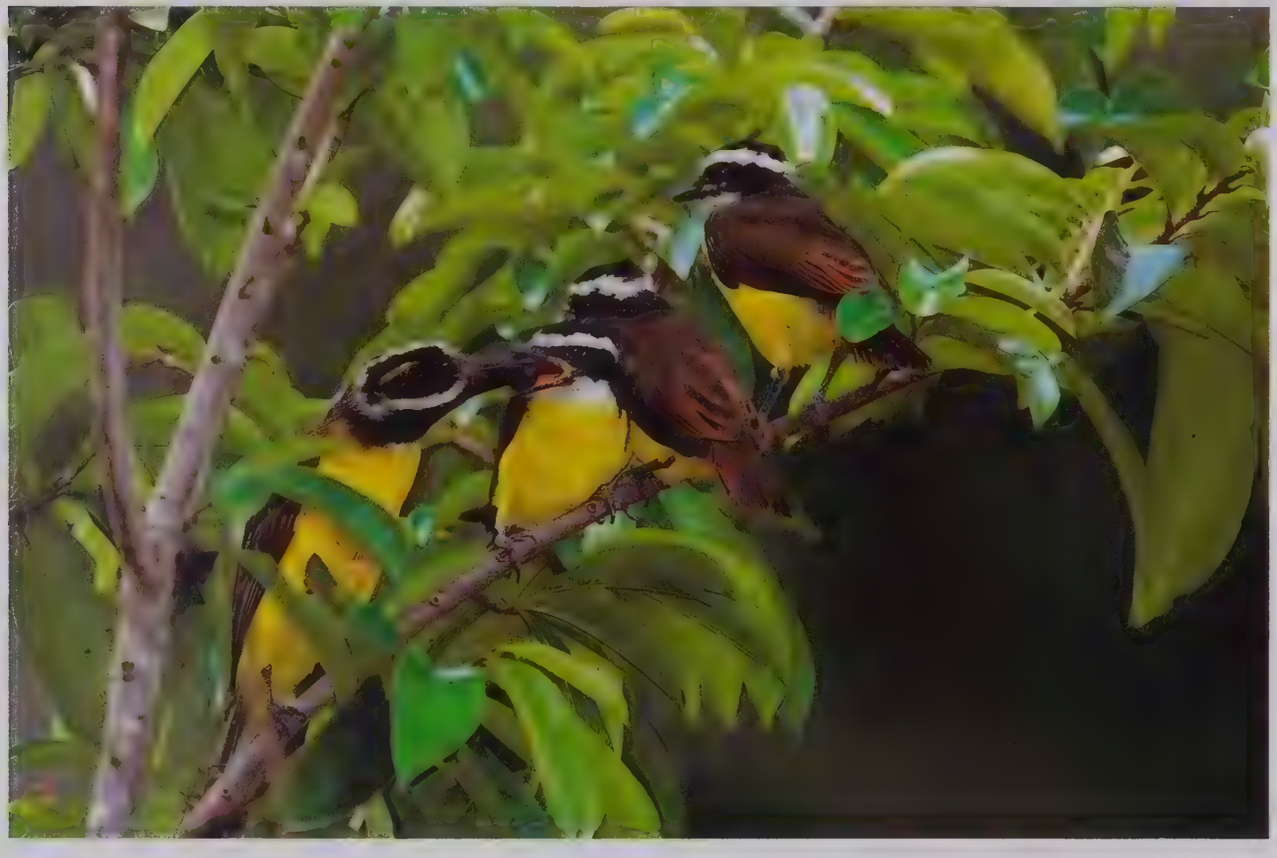


*Tyrannid nestlings fledge 12-24 days after hatching, but in most cases the nestling period is 14-17 days. When well-developed broods are disturbed, they are capable of abandoning the nest and fluttering away when even younger. Prematurely evacuated birds tend to have poor flying ability, however, making them highly vulnerable to predation. After hatching, fledglings usually conceal themselves in dense vegetation. This young **Great-crested Flycatcher** is fully exposed on a dead snag, probably having just recently left its hole for the first time. Both members of the pair feed the young actively during the post-fledging period.*

[*Myiarchus crinitus*, Ohio, USA. Photo: Dave Maslowski/ Maslowski Productions]

the Galapagos Flycatcher, while introduced herbivores such as cattle, deer, goats, pigs and sheep have a serious impact on the understorey vegetation within their forest habitats. Nevertheless, the first two of those species, at least, appear to be tolerant of degraded understoreys. Nest competition from the introduced hole-nesting Common Starling (*Sturnus vulgaris*) may cause some problems, at least locally, for the Great Crested Flycatcher and possibly other North American tyrannids.

Certainly, parasitism by cowbirds has a negative effect on some tyrant-flycatchers, including the Acadian and Willow Flycatchers in North America, as well as a Vulnerable tyrannid in central South America, the Black-and-white Monjita. Cowbird parasitism, however, is really only a secondary effect of habitat fragmentation, as the cowbirds benefit from the creation of open spaces and edges, so that parasitism by these birds almost invariably increases with habitat degradation and fragmentation. The



*Fledged broods of tyrant-flycatchers often remain in close proximity to each other for several days. During this time, they may roost together on the same perch, even touching shoulder-to-shoulder in a row. After attaining independence, the young of most non-migratory species linger on the natal territory until shortly before the next breeding season. This **Great Kiskadee** has raised a brood of three, with which it will associate over the coming months. Even at this young age, they develop a plumage remarkably similar to that of adults. As in most juvenile tyrannids, the back and wing feathers are edged somewhat more rufous or buffy than in the adults.*

[*Pitangus sulphuratus sulphuratus*, Savane Cézaré, Macouria, French Guiana. Photo: Tanguy Deville & Olivier Tostain/EcoBios]



Tyrant-flycatchers are often passed over as drab little brown birds, but several species are confiding friends right on our doorstep. ***Say's Phoebe****, for example, is a celebrated bird of the American West, familiar in rural regions because of its habit of living alongside people. It nests freely in man-made structures, making use of barns, bridges, wells, abandoned mines, electrical fixtures, old cars, trailers, outhouses, shelves, rafters, girders, ledges, drainpipes, eaves and even on old cow skulls in cabins. Some nests are placed in mail boxes, even causing complications with the local mail service.*

[*Sayornis saya saya*, California, USA. Photo: Dave Maslowski/ Maslowski Productions]

current spread and increase of cowbirds all over the Americas could, therefore, affect many more tyrant-flycatcher species in the near future.

While the causes of the decline of most threatened tyrannids appear relatively obvious, two species have declined for reasons that are largely unknown. The White-tailed Shrike-tyrant (*Agriornis andicola*) is classified as Vulnerable because it has declined precipitously in recent decades, and it is now very rare and local in open grassy and shrubby areas in the high Andes, from Ecuador south to northern Argentina. Some authors have suggested habitat alteration as the reason for the rapid diminution in its numbers, but most of its habitat remains relatively undisturbed and may have even expanded through burning and grazing. This species may, however, be especially sensitive to very slight habitat modifications, such as the loss of its nesting plant, *Puyas raimondii*, or it may simply be outcompeted by one of its congeners, the Black-billed Shrike-tyrant (*Agriornis montanus*). One of the rarest and most globally threatened tyrannids of all, the Giant Kingbird, now occurs only in a few large, remnant tracts of undisturbed woodland in Cuba. Habitat loss from logging and agricultural conversion is presumably a contributory factor, but more research on this Endangered species is needed in order to determine its precise ecological requirements.

Although hunting is normally not a threat to tyrant-flycatchers, a few species are sometimes used by children as targets for slingshots. Both the Noronha Elaenia and the White-tailed Shrike-tyrant have been mentioned in this context, and in the case of the latter species it may be one of the reasons for its otherwise rather puzzling decline.

Considerable uncertainty surrounds the conservation status of many members of the Tyrannidae, and for quite a number of reasons. One is, of course, pure ignorance of the very existence of species, and the discovery of eleven "new" tyrannids within the last two decades speaks volumes about the situation. In order of date of publication of description, these are the Cinnamon-breasted Tody-tyrant, the Alagoas Tyrannulet, the Antioquia Bristle-tyrant (*Pogonotriccus lanyoni*), the Restinga Tyrannulet, the Bahia Tyrannulet (*Phylloscartes beckeri*), the Cinnamon-faced Tyrannulet (*Phylloscartes parkeri*), the Orange-eyed Flycatcher, the Foothill Elaenia (*Myiopagis olallai*), Johnson's Tody-tyrant, the Mishana Tyrannulet and the Chapada Flycatcher. Naturally, having avoided detection for so long, many of these recently discovered species have very small ranges, and consequently four of the eleven are immediately considered globally threatened and a fifth is listed as Near-threatened. Other reasons for their belated discovery are, of course, identification problems, as *Phylloscartes* tyrannulets, *Pogonotriccus* bristle-tyrants, *Tolmomyias* flycatchers and the elaenias, among others, are all notoriously difficult to identify, at least visually. The increased use in recent years of vocalizations for identification purposes led to the discovery of several of the above species, and will undoubtedly aid in the discovery of yet more taxa and the splitting of known species, but the characteristics of these most recently discovered tyrannids should also make us wonder whether one or more elusive tyrant-flycatcher species have already been lost to the world without our ever having been aware of their existence.

In a similar vein, rediscoveries can immediately change the conservation status of a species. For example, both the Buff-cheeked Tody-flycatcher (*Poecilotriccus senex*) and Pelzeln's Tody-tyrant (*Hemitriccus inornatus*) were until recently known only from a single specimen of each, collected in 1830 and 1831,



*The **Juan Fernandez Tit-tyrant** is endemic to the island of Robinson Crusoe, in the Juan Fernández archipelago, far off the coast of Chile. Its presence on this remote island bears witness to the dispersal and migratory capabilities of certain small tyrannids, particularly those at high altitudes and latitudes. Despite its tiny range, several thousand birds are thought to survive, even in fairly degraded habitat. Although it is in no immediate danger of extinction, the introduction of mammalian predators such as cats and rats might pose a problem, and the species is currently classed as Near-threatened.*

[*Anairetes fernandezianus*,
Juan Fernández Islands,
Chile.
Photo: Roland Seitre]

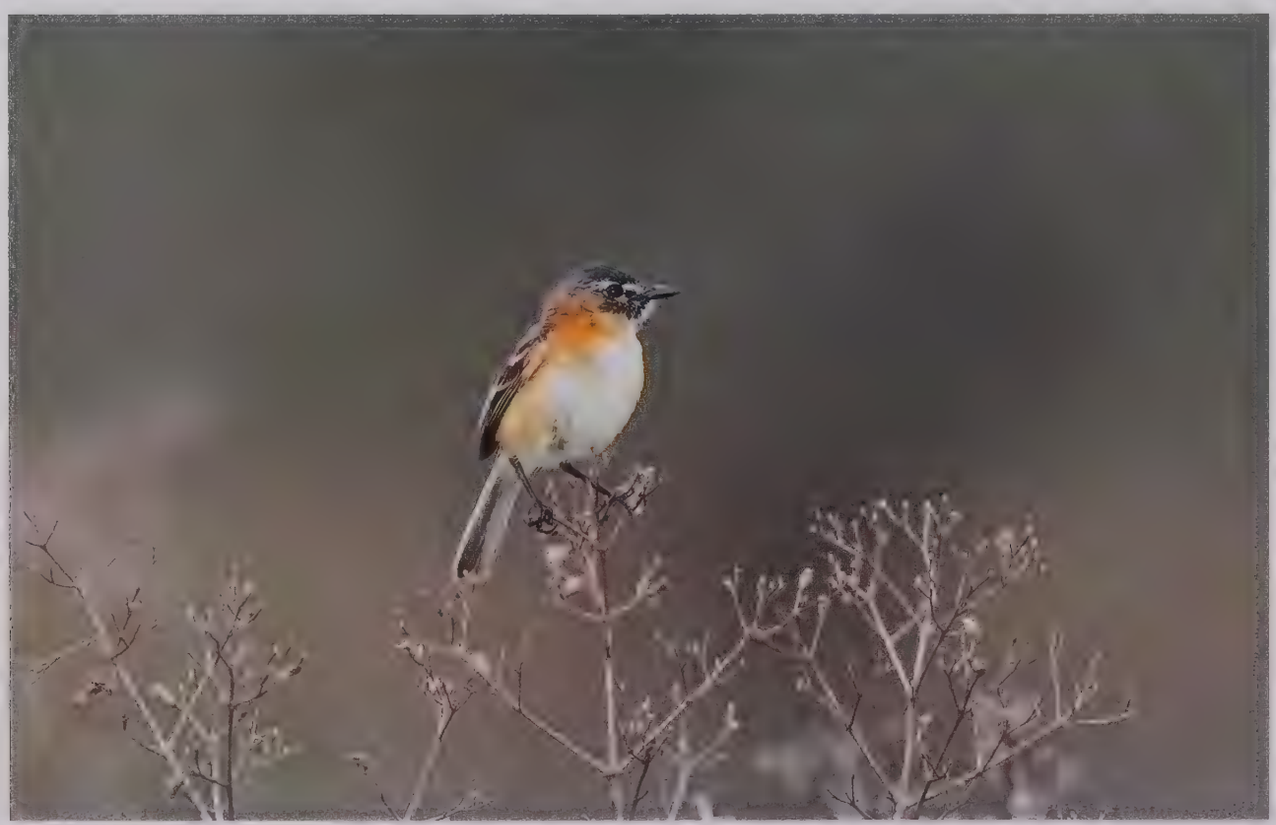
respectively, and were therefore considered possibly extinct or, at the very least, extremely rare. The Buff-cheeked Tody-flycatcher, however, was rediscovered in 1993, at the type locality in central Brazil, and found to be fairly common within pristine habitat. Likewise, Pelzeln's Tody-tyrant was refound in 1992 about 1000 km away from its north-west Brazilian type locality, a discovery that immediately extended the species' known range quite dramatically; it was subsequently found in several other localities with good habitat. Consequently, both of these tyrannids, previously regarded as extremely rare at best, are now considered not to be under threat.

Two other rediscoveries, however, led to improved assessments of conservation status, but with much less favourable prospects. Kaempfer's Tody-tyrant was first discovered in 1929 and was recorded again at the type locality in 1991; with just two more localities added recently, it is an Endangered species. The Minas Gerais Tyrannulet was discovered for the first time by scientists in 1926, found at the same locality in 1977, and recorded at three further sites more recently. One of these new localities is protected, but the species must still be considered to be Critical.

Fortunately, these four rediscoveries, made after many long decades without any sightings of the species involved, mean that no tyrant-flycatcher is currently thought to be extinct. Nevertheless, several species are precariously close to final extirpation.

Increased taxonomic knowledge can change the perceived conservation status of a population. The Chapada Flycatcher was split from the Suiriri Flycatcher in 2001, on the basis of differences in its vocalizations and display behaviour (see Systematics). Immediately, this new taxon may become a species of conservation concern, as its habitats are being eroded by livestock farming and large-scale cultivation of cash crops. Likewise, two of the subspecies of the Royal Flycatcher, *occidentalis* and *swainsoni*, are of immediate conservation concern, as their coastal rainforests are severely threatened by rapid deforestation and fragmentation. Both races have been elevated to species status by several authors, and are, in fact, currently listed as Vulnerable and Endangered, respectively. A final instance of the way in which taxonomic changes influence assessments of conservation status concerns the recent splitting of the Greenish Tyrannulet (*Phyllomyias virescens*) into three distinct species: one of the two newly erected species, Urich's Tyrannulet (*Phyllomyias urichi*), has immediately been categorized as Endangered, and the other, Reiser's Tyrannulet (*Phyllomyias reiseri*), is possibly on the brink of becoming threatened. These examples illustrate that taxonomic treatments that underestimate species-level biodiversity may lead to many unique life forms being overlooked when conservation priorities are being set.

Improved knowledge of the distribution and abundance of species can also lead to reassessment of their conservation status. For example, the Sharp-tailed Tyrant was recently redis-



*The **Bearded Tachuri** is listed as Near-threatened. It occurs over a large area from Colombia and Venezuela to Bolivia and Argentina, but its populations are small and highly localized in specialized habitat. Natural retreat of native grassland produced this relictual range, and the habitat is also extremely susceptible to destruction through the development of rural economies and the inexorable expansion of agriculture. Vast areas of prime grassland are burnt or ploughed annually, and converted to grazing lands or crops. Fortunately, the Bearded Tachuri seems to tolerate a fair degree of grassland perturbation, and it remains fairly common in several regions.*

[*Polystictus pectoralis pectoralis*,
Itirapina,
São Paulo, Brazil.
Photo: Edson Endrigo]



*The tail of the **Sharp-tailed Tyrant** is unique in the family: it is made up of only ten rectrices, all of which are distinctly slender and stiffened, with degenerate barbs. This structure is more akin to the tails of* Synallaxis *spinetails than to that of any other tyrannid. The bill is also unusual, being rather short and stubby, perhaps related to the fact that seeds form a part of the diet. The Sharp-tailed Tyrant is a bird of grassy plains in Bolivia, Brazil, Paraguay and Argentina. It is treated as Near-threatened because its populations and favoured habitat are shrinking rapidly over many parts of its range. In a few areas, however, it remains widespread and locally quite common.*

[*Culicivora caudacuta*, Serra da Canastra, Minas Gerais, Brazil. Photo: Edson Endrigo]

covered in eastern Paraguay and recorded for the first time in La Paz, in Bolivia, and Entre Ríos, in Argentina; this tyrannid, currently listed as Near-threatened, may therefore be less at risk than was hitherto believed. Likewise, another Near-threatened member of the family, the Russet-winged Spadebill (*Platyrinchus leucoryphus*), is now thought to be more common within its range in Paraguay and south-east Brazil as a result of a recent increase in records following improved knowledge of its vocalizations. Many species of tyrant-flycatcher, as they sit motionless for long periods or hide in the canopy or dense vegetation, are notoriously difficult to detect and, equally, many are very difficult to identify visually and, sometimes, even acoustically. With advances in knowledge and understanding, we can expect reports of range increases and higher abundances for many species in the future. For example, the Glossy-backed Becard (*Pachyramphus surinamus*) has been reported from three widely separated localities; given its secretive canopy-dwelling behaviour, however, it is likely that further intensive fieldwork will lead to additional records in the intervening areas, thus filling in the gaps in this species' distribution and probably extending its recorded range. This is just one of at least 61 tyrannid species which field ornithologists such as S. L. Hilty and R. S. Ridgely have cited as being often overlooked. The publication of new, up-to-date field guides and the increased use of vocalizations as an identification tool will undoubtedly improve our knowledge of the conservation status of many tyrant-flycatcher species.

The migratory habits of many tyrannids (see Movements) also make it difficult to assess their true conservation status. The abundances of some migratory species may vary greatly from one year to another, as at the southern tip of South America, where numbers of both the Cinnamon-bellied Ground-tyrant and the Chocolate-vented Tyrant appear to fluctuate to such an extent that various authors disagree on the population levels of these species, making any assessment of their conservation status more difficult than it is for resident species. The migratory habits of several species were also observed recently from a crane overlooking the forest canopy in southern Venezuela, as part of the Surumoni Crane Project. At the onset of the rainy season, a marked increase in tyrannid flocks moving across the rainforest canopy was noted, suggesting that insectivorous species undertake short-distance or long-distance migrations to follow rainfall patterns. Observations of resident as well as migrating birds in the canopy may thus lead to a better understanding of their overall abundance, range and movements. Many tyrannid species rarely seen from the ground may, in fact, appear more common once canopy access has allowed better opportunities for observation.

Moreover, the canopy-dwelling habits of many flycatcher species make them, in general, less vulnerable to habitat frag-

*The **Serra do Mar Tyrannulet** qualifies for the Near-threatened category on the basis of its small range, and the disastrous loss of habitat in the Atlantic Forest. The future of this species looks relatively secure because it inhabits the understorey of montane forest, large tracts of which receive protection in a number of important parks and reserves. For example, it survives in good numbers within Itatiaia National Park and southwards through the Serra do Mar. Permanent effective habitat protection is vital for this species, and for many other taxa endemic to the region.*

[*Phylloscartes difficilis*, Campos do Jordão, São Paulo, Brazil. Photo: Edson Endrigo]





*The **Salinas Monjita** was initially described as an isolated northern race of the Rusty-backed Monjita* (Xolmis rubetra). *Once elevated to species status, its tiny global range caused concern and the taxon was listed as Near-threatened. It is restricted to patchy scrub and salt-impregnated flats around Salinas Grandes, in north-west Argentina, a habitat unlikely to suffer much developmental pressure in the near future. Like its Patagonian relative, this monjita is semi-terrestrial, looking oddly like a lark (Alaudidae) or wheatear* (Oenanthe) *at a glance, when running around on the ground.*

[*Xolmis salinarum*, San José de las Salinas, Córdoba, Argentina. Photo: José & Adriana Calo]

mentation than are understorey birds such as the antbirds. This is because canopy species seem more inclined to cross large gaps within the forest, whether natural ones, such as savannas or rivers, or man-made ones, such as roads and clearings. Thus, many tyrannids are well adapted to conditions of forest edge and secondary vegetation, where they eat small berries and insects, and may suffer less from habitat degradation than do avian taxa more dependent on closed forests. It is likely, therefore, that a good number of the 380 or so tyrannid species not globally threatened or Near-threatened will remain so within the foreseeable future.

The ecological characteristics that make a species especially vulnerable to extinction are a small total range, a low-density population, and specialization on a habitat that suffers rapid rates of degradation, fragmentation and destruction. Many tyrant-flycatchers have small ranges, and three species are considered threatened simply because they occur on small islands, even though the forest habitats on which the Noronha Elaenia, the Cocos Flycatcher and the Juan Fernandez Tit-tyrant depend appear relatively secure. On the other hand, some species with large geographical ranges may still occupy only small areas within these ranges. Habitat specialization is almost always the reason for this, and two prime examples are of species restricted to narrow bands of successional riparian forest and species confined to tree-line habitats in the high Andes. Such linear habitats can sustain only very small bird populations, but the tendency to illustrate ranges by "filling in" areas on maps with continuous shading may vastly overstate the true abundance of the species concerned.

One species that seems to occur naturally at low densities is the Royal Flycatcher. The fact that, for breeding, it apparently requires humid forest with streams below may explain its rarity even in pristine habitat. Consequently, the two subspecies with small ranges, western *occidentalis* in the coastal lowland forests of the Tumbesian region and eastern *swainsoni* along the Atlantic coast of south-east Brazil, are especially threatened by the rapid destruction and fragmentation of their habitats. Other globally threatened taxa that appear to occur at naturally low densities are the Rufous-sided Pygmy-tyrant, Kaempfer's Tody-tyrant and the White-tailed Shrike-tyrant, and the Near-threatened Russet-winged Spadebill is similarly disadvantaged.

As habitat degradation, fragmentation and destruction proceed unabated, the future prospects of most species now considered to be at risk will almost inevitably deteriorate. Likewise, the status of some others not yet placed in this category may well change. The combined factors of small range size, intolerance of degraded habitats and rapid habitat destruction are the foremost cause for concern. A whole suite of species falls within this sphere, and all should be closely watched in the future. They include, among others, the Pacific Elaenia (*Myiopagis subplacens*), the Slaty Elaenia (*Elaenia strepera*), the Unstreaked Tit-tyrant, the Mishana Tyrannulet, the Peruvian Tyrannulet (*Zimmerius viridiflavus*), the Ecuadorian Tyrannulet (*Phylloscartes gualaquizae*), the Inca Flycatcher and the Sooty-crowned Flycatcher (*Myiarchus phaeocephalus*). A further five species are already included on the red lists of Ecuador and Colombia, and two of these, the Spectacled Bristle-tyrant and the Yellow-throated Spadebill (*Platyrinchus flavigularis*), may be on the brink of globally threatened status, while the three others, the



Unusual tarsal scutellation in Euscarthmus *led to its exclusion for a time from the tyrant-flycatchers; it was suspected to belong amongst the typical antbirds (Thamnophilidae). Although syringeal morphology soon identified it as tyrannid, it differs from all its likely relatives by building a cup-shaped nest. The **Rufous-sided Pygmy-tyrant** has a puzzling distribution in fire-prone* cerrado *of central Brazil: it is present at a large number of sites, but absent from many others that are ecologically similar. Given the pressures faced by South American grassland in general, this species is classed as Vulnerable.*

[*Euscarthmus rufomarginatus*, Bahia, Brazil. Photo: Arthur Grosset]



In terms of absolute numbers, the ***Noronha Elaenia*** *is one of the rarest of tyrant-flycatchers. It is restricted to the Fernando de Noronha archipelago, off north-east Brazil, where around 500 individuals are thought to survive. The habitat is relatively secure, but the species is classified as Vulnerable in view of the very small size of the population. An upsurge in tourism could have a negative impact on the extent and quality of natural habitat on the islands, and it would seem prudent to establish a terrestrial protected area; the islands already form a marine national park.*

[*Elaenia ridleyana*, Fernando de Noronha Island, Brazil. Photo: Luiz Claudio Marigo]

Subtropical Doradito, the Speckled Mourner (*Laniocera rufescens*) and the Spot-billed Ground-tyrant (*Muscisaxicola maculirostris*), are all more common in other parts of their relatively large ranges.

Similarly, globally non-threatened species with relatively large ranges may nonetheless contain subspecies that are apparently at risk. Two subspecies of the Royal Flycatcher have already been mentioned in preceding paragraphs. Other examples are the Colombian subspecies *bogotensis* of the Bearded Tachuri and the Grenadan subspecies *flaviventris* of Euler's Flycatcher, both of which may already be extinct. In addition, the race *albogriseus* of the Sirystes is threatened by rapid deforestation within its small range in east Panama and adjacent north-west Colombia.

Even species with genuinely large ranges may become threatened if their habitats are destroyed on a large scale. Such may be the case for many of the tyrannids dependent on grassland and savanna and which historically had relatively large ranges. Their habitats are now being eliminated so rapidly that very soon the only remaining fragments will be found within protected areas. Species that may require monitoring are the Suiriri and Chapada Flycatchers, the Rusty-backed Monjita, the Chocolate-vented Tyrant, the Rufous Casiornis and the Ash-throated Casiornis (*Casiornis fuscus*).

Moreover, forest-dependent species have become locally extinct within those parts of their range where deforestation has been especially intense. In Panama, for example, this has been the case in western Chiriquí, where local extinctions have been recorded for the Slaty-capped Flycatcher, the Eye-ringed Flatbill, the Golden-crowned Spadebill, the Rufous Mourner (*Rhytipterna holerythra*) and the Speckled Mourner. The same fate has befallen local populations of the Bronze-olive Pygmy-tyrant and the Rufous-breasted Flycatcher in central Colombia, the Rufous-headed Pygmy-tyrant and the Yellow-margined Flycatcher in south-west Ecuador, and the Southern Bristle-tyrant (*Pogonotriccus eximius*) and the Rufous-sided Pygmy-tyrant in São Paulo, in Brazil.

Despite what appears to be a generally gloomy picture of the fortunes of the Tyrannidae, some members of the family obviously benefit from the degradation and destruction of pristine habitats and, indeed, thrive in human-modified landscapes. These include some of what are now most common and well-known bird species of the Americas. Foremost in this category must be the Great Kiskadee and the Tropical Kingbird, both of which have doubtlessly increased in abundance and range wherever forests have been opened up and irrigation has brought vegetation to semi-arid and arid areas. Couch's Kingbird and the Western Kingbird likewise increased for similar reasons, the latter spreading as human settlements and cultivation brought vegetation and artificial structures to the Great Plains of the USA. Other tyrannids seemingly benefiting from deforestation include the Mottle-backed Elaenia, the Sulphur-bellied Tyrannulet, the Mouse-coloured Tyrannulet, the Common Tody-flycatcher, the Olive-chested and Bran-coloured Flycatchers, the Short-crested Flycatcher and the Apical Flycatcher (*Myiarchus apicalis*). Meanwhile, the Golden-crowned Flycatcher and the Cliff Flycatcher appear to spread along roads, with the latter



Virtually restricted to lowland Atlantic Forest, as it is, the ***Sao Paulo Tyrannulet*** *is listed as Vulnerable. It is commonest at elevations below 400 m, precisely the zone most susceptible to habitat clearance. Indeed, only a tiny proportion of lowland Atlantic Forest remains intact. Nevertheless, this species seems an unlikely candidate for imminent extinction, given that it is fairly common in several protected areas. It still thrives in the forests of eastern Paraguay, including the Mbaracayú Forest Nature Reserve, and southern Brazil, including Iguaçu National Park and the lower slopes of the Serra do Mar.*

[*Phylloscartes paulista*, Carlos Botelho State Park, São Paulo, Brazil. Photo: Edson Endrigo]



*After many specimens were taken by early collectors throughout much of the Andes, the **White-tailed Shrike-tyrant** seemed to vanish. Upon its listing as Vulnerable, searches in several of its old haunts drew a blank. None of the suggested explanations seemed realistic, given that high-Andean habitats are little affected by hunting or habitat degradation. In recent years, there has been a steady increase in reports of the species, from Ecuador to Argentina. It seems to favour semi-arid habitat with tall montane plants, such as* Puya *bomeliads. With its patchy distribution at low densities, it requires careful monitoring.*

[*Agriornis andicola albicauda*,
Salar de Surire, Chile.
Photo: Gonzalo González Cifuentes/
Science Adventures]

also adapting to urban environments as convenient replacements for its natural cliff habitats.

The Grey Monjita forages preferentially in recently burned grasslands in central Brazil, and may be favoured by this management strategy. Similarly, restoration of savanna habitat by prescribed burning caused a reversal in population declines of Eastern Kingbirds in central North America.

During the last century, several tyrant-flycatcher species have apparently spread northwards into the USA and Canada. Although the reasons for this are not well known, the Pacific-slope, Buff-breasted and Grey Flycatchers, the Dusky-capped Flycatcher and the Thick-billed (*Tyrannus crassirostris*) and Western Kingbirds may all have benefited from habitat alteration and/or global warming. The detection of such changes in range and abundance is in large part due to the participants in the USA Breeding Bird Survey, whose systematic sampling efforts are one of the best ways of monitoring bird populations on a large scale. Such schemes are desperately needed in Middle and South America, in order to monitor more accurately the status of at least the threatened species, but it would require a huge input in terms of human and material resources even to begin the kind of capacity-building that would be necessary for such an undertaking. One important step would be to train a larger number of birdwatchers so that they can identify species correctly, for most published information still originates from a relatively small number of observers. The translation of English-language field guides into Spanish and Portuguese must be a high priority. Another important step would be to link conservation researchers, field ornithologists and birdwatchers by means of computers and internet-based interactive software, so that they can quickly share critical information. As an example, the organization Conservation International helped to create two data centres in Mexico, one a national biotic-resources information centre at the National University of Mexico and the other a state-level centre for Chiapas at the Instituto de Historia Natural. Other mapping projects have been undertaken by M. L. Isler and by the Zoological Museum at the University of Copenhagen, in Denmark.

Local, as well as global, action is urgently needed to conserve species and the habitats on which they depend. Local action has to focus on the root causes of habitat destruction and degradation, such as the need of local people for timber, firewood, or pasture for livestock. For instance, wherever forest remnants survive on steep slopes, they should be fenced in to restrict livestock movements to relatively flat areas, thereby both decreasing energy expenditure and increasing milk and meat production of the cattle while saving steep areas from degradation and soil erosion. Once such areas regenerate, they could be used for timber and other forest products in a sustainable way.



*In recent decades, the damp meadows and grasslands of southern Brazil and northern Argentina have been badly degraded or eliminated altogether by agricultural expansion and extensive planting of non-native trees, such as cultivated pines. These influences have resulted in substantial declines in the population of one extremely elegant tyrant-flycatcher, the **Black-and-white Monjita**. Now classed as Vulnerable, this species also suffers intensive brood-parasitism by cowbirds* (Molothrus), *a genus favoured by the spread of ranchland. Large protected areas encompassing pristine wet* pampas, *bogs and meadows are needed to ensure that this beautiful bird survives.*

[*Xolmis dominicanus*,
Estancia San Juan
Poriahú, Corrientes,
Argentina.
Photo: José & Adriana Calo]





The genus Alectrurus *contains two remarkable tyrant-flycatchers, both listed as Vulnerable. Both are strongly sexually dimorphic, with piebald plumage and spectacular tails in the males, and both are undergoing serious population declines. The range of the* ***Cock-tailed Tyrant*** *is centred on the* cerrado *region of Brazil, whereas the* ***Strange-tailed Tyrant*** *breeds in southern Paraguay and northern Argentina. The former gets its name from the strange fan-shaped tail resembling a miniature rooster's tail. The latter needs no explanation: its hugely elongated, bare-shafted outer-tail feathers are bizarre indeed. In the breeding season, male Strange-tailed Tyrants lose the feathering of their throats, and the exposed skin turns bright orange or red. Males of both these species spend much of the breeding season performing eye-catching aerial displays, and apparently contributing nothing towards parental care. Evidence is increasing that these are both polygynous species (males are simultaneously mated to several females inside their territory). Sadly, both birds are a rare sight in today's man-modified landscapes. Two-thirds of Brazil's* cerrado *grassland have been destroyed, and huge areas of the Paraguayan and Argentine meadows and* pampas *have been converted into plantations, crops and grazing lands. Given this devastation of natural habitats, an effective network of reserves is required to safeguard both of these bizarre, fascinating tyrants.*

[Above: *Alectrurus tricolor*, Paraparau, Beni, Bolivia. Photo: Joe Tobias.

Below: *Alectrurus risora*, Corrientes, Argentina. Photo: Darío Podestá]



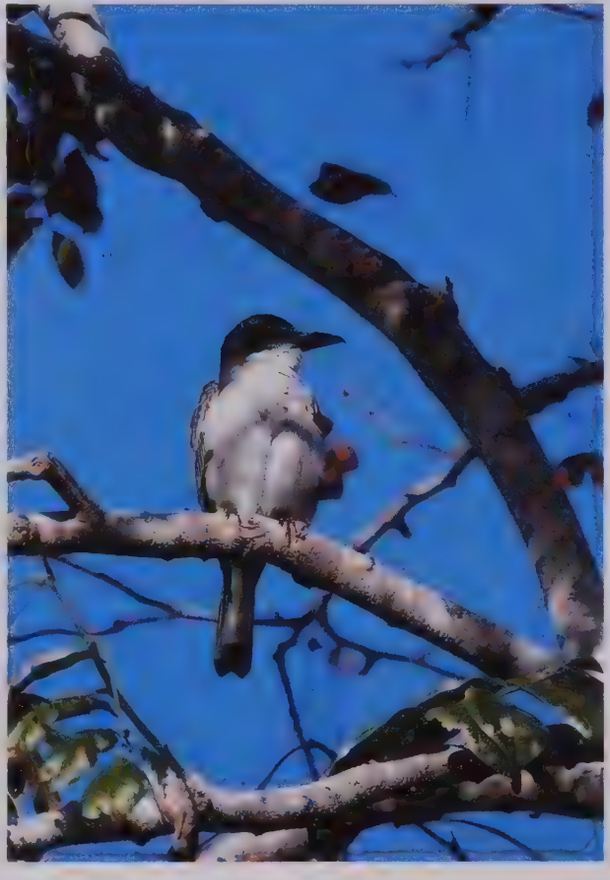
*The diminutive **Fork-tailed Pygmy-tyrant** is an aberrant member of its genus from the Atlantic Forest of south-eastern Brazil. It has a forked tail with pale tips (and only 10 rectrices) and a strange, all-buffy head. Its fondness for stands of bamboo probably explains its very patchy distribution. Species that rely on bamboo have a special conservation challenge, because bamboo tends to thrive, then, after flowering, die out simultaneously over large areas. This means that larger blocks of protected forest are required to safeguard locally distributed bamboo specialists. For this reason, and the paucity of sites from which it is known, this rarely observed pygmy-tyrant is listed as Endangered.*

[*Hemitriccus furcatus*, Ubatuba, São Paulo, Brazil. Photo: Edson Endrigo]

In Peru, for example, several small and widely separated *Polylepis* woodlands on which the Ash-breasted Tit-tyrant, an Endangered tyrannid, depends are found around Abra Málaga, in Cuzco; these woodlands are continuously degraded by timber removal, cattle grazing and fires, but recent conservation projects and public-awareness campaigns have accomplished a slowdown in the exploitation of the timber. Often, local involvement of this kind is indispensable, as many critically important sites are within densely populated areas with rapid human population growth. For example, while many reserves still suffer from the impacts caused by local inhabitants trying to eke out a living, a conservation organization in north-east Brazil, called Associação Nordeste, has attempted to link conservation with the interests of the human community living near the Pedra Talhada State Park, in Alagoas. This reserve protects one of the last remaining Atlantic Forest tracts in the state, as well as the globally threatened Alagoas Tyrannulet and Buff-breasted Tody-tyrant. Significant areas in Pedra Talhada are now being reforested with native trees, and protection is enforced by guards and welcomed by the local community.

Greater human resources are urgently required in order to involve local communities in the protection of their immediate environments and to give reserve-managers the necessary means to protect their reserves from outside intrusions. The immediate goal must be to save critical sites from complete destruction, so as to prevent the demise of, for instance, the Minas Gerais Tyrannulet and the Piura Chat-tyrant (*Ochthoeca piurae*), the latter so far not known to occur within any protected area. The long-term survival of many endangered populations, however, will also depend on the enlarging of protected areas through reforestation and connecting them by means of protected "corridors". Nowadays, the local eradication of introduced predators and herbivores on small islands is feasible, although the removal of "harmful" species, such as the Common Starling, on a continental scale is a very different matter.

If habitat loss and species extinctions are to be halted, local action must be backed up by global initiatives. The rapid growth in the human population is a major concern, one requiring serious attention from both political leaders and the general public, yet there is an almost universal reluctance even to discuss this issue, let alone to tackle it. Further, consumption patterns and the exploitation of natural resources must be changed to sustainable levels. As an example, the undiminished craving in the developed world for soya beans in order to feed livestock has led to the widespread clearing of forests and other critical habitats all over South America, even within protected areas. Likewise, most tropical hardwoods utilized in the developed world still do not originate from sustainable sources. Much habitat clearance has



*The **Giant Kingbird** is another Endangered tyrannid. It has disappeared from its previous haunts in the Bahamas and the Turks and Caicos Islands, and is now very rare and local in Cuba, probably as a result of deforestation. It favours pine forest and woodland, habitats that are continuously being cleared and converted to agriculture, or logged for timber. Few data are available regarding its ecological requirements, and field research is urgently needed for developing a programme of effective conservation action.*

[*Tyrannus cubensis*, Najasa, Cuba. Photo: Roy de Haas/ AGAMI]



*First collected in the forests of Santa Catarina, south Brazil, in 1929, **Kaempfer's Tody-tyrant** "disappeared" for over 60 years before it was rediscovered at the type locality in 1991. Although it survives here in small numbers, and at two further sites, available evidence suggests that its total range is very small and its habitat is subject to constant pressure. As a result, it is considered Endangered. More survey work is required in order to assess its true status and distribution. The Volta Velha reserve requires strict protection and, if possible, expansion to include further tracts of suitable habitat.*

[*Hemitriccus kaempferi*, Volta Velha Reserve, Itapoá, Santa Catarina, Brazil. Photo: Dante Buzzetti]

also been the result of government incentives and development schemes, which are often economically unsound but are supported by special-interest groups within business and government. State and national laws, government regulations, the allocation of resources by both government and businesses, and international treaties regulating finance and trade all have a direct influence on the way in which environmental resources are used, and thus on habitats on which wildlife birds depends. Many ecologists and conservationists are realizing more and more that national and global laws, regulations and treaties have direct impacts on local habitats and populations, and that to ignore these causal linkages is to render long-term conservation efforts ineffective and ultimately useless.

Basically, economic rules that reward environmental destruction with financial benefits and punish environmental protection with competitive disadvantages will lead to the exploitation of all natural resources, until the point when they become so rare and valuable that their protection is worth more than their destruction. For example, some privately run reserves now earn more money from ecotourism than they would make from cutting down the forest. If we wait for that point to arrive, however, most natural areas will by then have disappeared and many species will have become extinct. Moreover, even if the protection of natural habitats may render a greater economic benefit, such benefits often cannot be reaped because the resources required to build the initial infrastructure for a successful ecotourism enterprise simply do not exist. In other words, the knowledge and the money needed for the wise and sustainable use of the natural environment are lacking.

If the future of the globally threatened Tyrannidae and that of all other wildlife species is to be secured, it is vital that environmentally sustainable long-term planning is adopted into political and economic thinking, decision-making and administration at all levels of government and business.

*Only two tyrant-flycatchers are listed as Critical, one of which is the **Minas Gerais Tyrannulet**. This poorly known species was discovered in semi-deciduous forests along the River São Francisco, in Minas Gerais, Brazil, in 1926. Although it was found again at the same site in 1977, it has disappeared there during subsequent years, as suitable habitat has been destroyed. Fortunately, small populations do survive at other sites, including the newly established Cavernas do Peruaçu National Park. Strict protection of this area is a priority, given the severe pressure on remnant woodland and emergent trees, for both timber and new agricultural land.*



[*Phylloscartes roquettei*, Cavernas do Peruaçu National Park, Januária, Minas Gerais, Brazil. Photo: Dante Buzzetti]

General Bibliography

Ames (1971), Beal (1912), Begazo (1995), Berlepsch (1907), Birdsley (2002), Bock (1994), Chesser (1995), Cicero & Johnson (2002), Elphick *et al.* (2001), Fitzpatrick (1980b, 1980c, 1981, 1985a, 1985b, 1985c), Hespenheide (1971b), Ihering (1904), Irestedt *et al.* (2001), Johansson *et al.* (2002), Johnson, N.K. (1963b, 1980), Lanyon, S.M. (1985), Lanyon, W.E. (1967a, 1984, 1985, 1986a, 1988a, 1988b, 1988c), Mayr & Short (1970), McKitrick (1985), Mobley (2002), Mobley & Prum (1995), Prum (1990a, 1990b), Prum & Lanyon (1989), Sherry (1984), Sibley & Ahlquist (1985c, 1990), Sibley & Monroe (1990, 1993), Smith (1966, 1971), Staicer *et al.* (1996), Terborgh (1971), Terborgh & Weske (1975), Traylor (1977, 1979a, 1982, 1985), Traylor & Fitzpatrick (1982), Warter (1965), Weske (1972), Westcott (1994), Zimmer & Whittaker (2000).



PLATE 16

inches 2

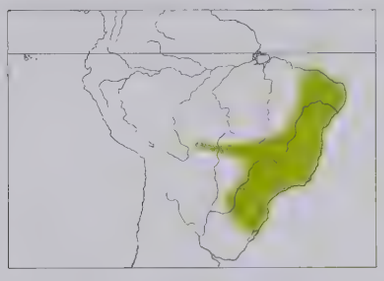
cm 5

Subfamily ELAENIINAE
Tribe ELAENIINI
Genus *PHYLLOMYIAS* Cabanis & Heine, 1859

1. Planalto Tyrannulet
Phyllomyias fasciatus

French: Tyranneau fascié **German**: Planaltokleintyrann **Spanish**: Mosquerito Oliváceo

Taxonomy. *P[ipra] fasciata* Thunberg, 1822, Jaguacara, Bahia, Brazil.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that present species may be closest to *P. griseocapilla* and *P. griseiceps* and that all three perhaps unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Three subspecies recognized.
Subspecies and Distribution.
P. f. cearae Hellmayr, 1927 - NE Brazil (Ceará and Rio Grande do Norte S to Sergipe).
P. f. fasciatus (Thunberg, 1822) - E Brazil (Maranhão and W Bahia S to SE Mato Grosso and S Goiás) and W & NE Bolivia.
P. f. brevirostris (Spix, 1825) - SE Brazil, E Paraguay and NE Argentina.

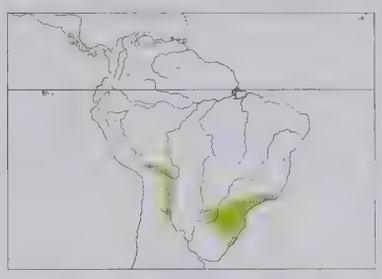


Descriptive notes. 11-11·5 cm. Dull, very small-billed tyrannulet. Nominate race is greyish-olive to brownish-olive above, darker grey on crown; supraloral stripe and eyering whitish; wings dusky, two somewhat indistinct wingbars and edges of flight-feathers pale olive to whitish; tail dusky; throat and lower face whitish, underparts yellow, washed olive on breast and sides; iris brown; bill small and rounded, blackish; legs grey. Sexes alike. Juvenile resembles adult. Races differ in size and in colour intensity: *brevirostris* is somewhat larger and darker olive above than nominate, wingbars and edges of remiges pale olive, throat less extensively white, underparts darker yellow; *cearae* is similar to previous but duller, less yellowish, with darker brown crown, paler yellow underparts. Voice. Calls frequently, a soft, leisurely whistle usually of three syllables of same length but gently descending, "pee-pew-puuit" or "pee, pew, pew," also "eweet, ewwet, eweet"; sometimes grades into longer song, a jumble of notes alternating loud and soft, and including clear whistles, "dliewt..., ra-ewt".
Habitat. Humid tropical evergreen forest, less often semi-deciduous woodland and gallery forest; sea-level to 1800 m, most frequent at 500-800 m.
Food and Feeding. Insects, also small fruits. Forages singly or in pairs, rather high in canopy, tail held partially cocked; often with mixed-species flocks. Perch-gleans, also makes short sallies to hover-glean items.
Breeding. Sept-Feb, nest found in Nov, in SE Brazil (Rio Grande do Sul). Group display involves 3-4 or more individuals nervously hopping through vegetation, occasionally singing. Nest cup-shaped, 6·6 cm across, inner diameter 4·1 cm, woven of moss and fungal hyphae (of *Marasmius*), covered inside and outside with flakes of lichen, placed 7 m up in four-way crotch of outer branch, surrounding branches also covered with lichen and moss. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Apparently present only in austral summer (Sept-Mar/Apr) in SE Brazil (Rio Grande do Sul), suggesting N movement by populations from extreme S, but confirmation needed.
Status and Conservation. Not globally threatened. Fairly common to locally common in much of its relatively large range. Occurs in several protected areas, including Noel Kempff Mercado National Park, in Bolivia, and Serra da Canastra National Park and Patrimônio Natural do Caraça Special Reserve (Minas Gerais) and Itatiaia and Aparados da Serra National Parks, in Brazil.
Bibliography. Bates & Parker (1998), Bates *et al.* (1998), Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Clay, Tobias *et al.* (1998), Cory & Hellmayr (1927), Develey (2004), Dubs (1992), Ferreira de Vasconcelos (2001), Hayes (1995), Lanyon (1988b), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Parker *et al.* (1991), de la Peña (1988), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977).

2. Rough-legged Tyrannulet
Phyllomyias burmeisteri

French: Tyranneau pattu **German**: Burmeisterkleintyrann **Spanish**: Mosquerito de Burmeister
Other common names: White-fronted Tyrannulet (*leucogonys*); Zeledon's Tyrannulet (*zeledoni*)

Taxonomy. *P[hyllomyias] Burmeisteri* Cabanis and Heine, 1859, Rio de Janeiro, Brazil.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that *P. fasciatus*, *P. griseocapilla* and *P. griseiceps* may be unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Present species was for long treated in its own genus, *Acrochordopus*, because of distinctively serrated tarsus, but tarsal scutellation now known to be unreliable as a generic character in the family. Nominate race and *zeledoni* sometimes considered to represent two distinct species, with the other four ("*leucogonys* group") forming a third species, but biological information about all populations remains scarce, and vocal and genetic relationships not yet studied; investigation needed especially in area of possible contact between *leucogonys* and nominate in S Peru and N Bolivia. Six subspecies recognized.
Subspecies and Distribution.
P. b. zeledoni (Lawrence, 1869) - Costa Rica and W Panama.
P. b. wetmorei (Aveledo & Pons, 1953) - Sierra de Perijá, in W Venezuela.
P. b. viridiceps (J. T. Zimmer & Phelps, Sr, 1944) - mountains of N Venezuela.
P. b. bunites (Wetmore & Phelps, Jr, 1956) - Chimantá-tepui, in SE Bolívar (E Venezuela).
P. b. leucogonys (P. L. Sclater & Salvin, 1871) - E Andes from Colombia S to SE Peru.
P. b. burmeisteri Cabanis & Heine, 1859 - E Andes of Bolivia and N Argentina, also locally from E & SE Brazil to SE Paraguay.

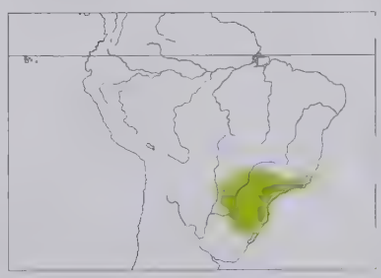


Descriptive notes. 11-11·5 cm; 11 g. Nominate race is olive above, crown slightly darker olive, forehead olive, narrow loral streak white; wings dusky, two wingbars and edges of flight-feathers pale olive-yellow to yellow; tail dusky olive; throat white, lower face grizzled whitish, underparts yellow, washed or flammulated with olive on breast and sides; iris dirty whitish, pale sandy brown or light reddish-brown; bill black, basal half of lower mandible whitish to pale flesh-coloured; legs greyish-black. Sexes alike. Juvenile resembles adult. Race *zeledoni* has crown slaty grey, narrow supercilium and eyering white, white of lores connecting across forehead; *leucogonys* differs from previous in larger bill, duller green back, slightly paler yellow underparts with less prominent flammulations; *wetmorei* is darker overall; *bunites* has tiny bill, dark grey of crown extends to hindneck; *viridiceps* has slate-grey forehead, rest of crown olive-green. Voice. Easily heard, high-pitched, repeated whistles, "psee-psee-psee-psee", on same pitch or falling slightly near end, also described as descending series of c. 6 loud "éeeet" or monotonously repeated "pseet" notes timed at 35-75 per minute (nominate race); also (*zeledoni* and "*leucogonys* group") a continuous series of double notes, "tzee-yeep tzee-yeep tsee-yeep" and single "péééza" at intervals of 2-3 seconds.
Habitat. Humid tropical and upper tropical evergreen forest, sometimes venturing to edges and older second growth. At 900-1850 m in Costa Rica and Panama, 475-1800 m in Colombia and Venezuela, 600-1500 m in Ecuador, and 750-1600 m in SE Peru; breeds in mountains in SE Brazil.
Food and Feeding. Arthropods and small berries. Forages alone or in pairs, sometimes with mixed-species flocks, mainly in middle or upper levels of vegetation, but may venture quite low when foraging alone. More sluggish than many tyrannulets, perching with horizontal posture for many seconds, occasionally flicking wings while perched, and making short upward sallies to hover-glean, or moving with short flights to new perch; also perch-gleans from branch or leaves.
Breeding. Birds with enlarged gonads in Oct and Dec in Brazil (Rio Grande do Sul). Nest cup-shaped, internal diameter 5-6 cm, external diameter 9-10 cm; one was placed 12 m up on outer, horizontal limb (Panama). No further information.
Movements. Apparently resident in most of range. In SE Brazil, present in Rio de Janeiro only in austral winter, suggesting either vertical migration from Serra do Mar or movement N by individuals from extreme S; latter perhaps more likely, as recorded in Rio Grande do Sul only during Oct-May.
Status and Conservation. Not globally threatened. Very uncommon to rare, and local, in Venezuela; uncommon to locally common elsewhere; perhaps often overlooked. Occurs in many protected areas throughout range, e.g. present in at least three national parks in SE Brazil.
Bibliography. Anon. (1998a), Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Chapman (1917c, 1926), Christian (2001), Clay, Tobias *et al.* (1998), Cory & Hellmayr (1927), Cracraft (1985), Davis (1986), Fjeldså & Maijer (1996), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Lowen *et al.* (1996), Miller (1963), Narosky & Salvador (1998), Parker *et al.* (1991), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins & Ridgely (1990), do Rosário (1996), Sick (1993, 1997), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Strewe & Navarro (2004), Traylor (1977), Walker *et al.* (2003), Weske (1972), Wetmore (1972), Zimmer (1941c).

3. Greenish Tyrannulet
Phyllomyias virescens

French: Tyranneau verdin **German**: Grünrücken-Kleintyrann **Spanish**: Mosquerito Verdoso

Taxonomy. *Muscicapa virescens* Temminck, 1824, Curytiba, Paraná, Brazil.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that *P. fasciatus*, *P. griseocapilla* and *P. griseiceps* may be unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Present species formerly placed along with *P. sclateri* in a separate genus, *Xanthomyias*. Appears to form a superspecies with *P. reiseri* and *P. urichi*; all were for long considered conspecific, but differences in morphology (plumage pattern, wing and tail proportions), degree of sexual dimorphism, habitat and voice evident. Has been suggested that *P. sclateri* also belongs in this group. Monotypic.
Distribution. SE Brazil (S Mato Grosso do Sul E to S Minas Gerais and Espírito Santo, S to C Rio Grande do Sul), SE Paraguay, and extreme NE Argentina.



Descriptive notes. 12 cm; 10-12 g. A bright green tyrannulet, somewhat longer-tailed than its close relatives. Is bright olive above from forehead and orbital area to rump; wings dusky, two wingbars and edges of flight-feathers pale yellowish; tail dusky; throat and lower face whitish, underparts yellow, faintly streaked olive on breast and sides; iris brown, bill small and rounded, brown to blackish, base of lower mandible brownish-white; legs medium to dark grey. Distinguished from similar *P. reiseri* by slightly larger size, olive ear-coverts, in the hand also by longer wing (male 58-65 mm, female 55-62 mm), longer tail (male 54-64 mm,

On following pages: 4. Reiser's Tyrannulet (*Phyllomyias reiseri*); 5. Urich's Tyrannulet (*Phyllomyias urichi*); 6. Sclater's Tyrannulet (*Phyllomyias sclateri*); 7. Grey-capped Tyrannulet (*Phyllomyias griseocapilla*); 8. Sooty-headed Tyrannulet (*Phyllomyias griseiceps*); 9. Plumbeous-crowned Tyrannulet (*Phyllomyias plumbeiceps*); 10. Black-capped Tyrannulet (*Phyllomyias nigrocapillus*); 11. Ashy-headed Tyrannulet (*Phyllomyias cinereiceps*); 12. Tawny-rumped Tyrannulet (*Phyllomyias uropygialis*); 13. Yellow-crowned Tyrannulet (*Tyrannulus elatus*).

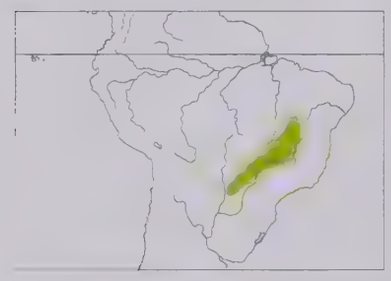
female 51-62 mm). Sexes alike. Juvenile resembles adult. VOICE. Rapid series of notes, begins with staccato "chk" notes rising rapidly in pitch, then becoming longer sounds that fall and slow slightly at end, "chk-chk-chk-chk-chk-cheee-eeee-eeee-eeee-chu-choo".
Habitat. Humid tropical and upper tropical evergreen forest and edges, also secondary growth; to 1000 m.
Food and Feeding. Poorly known. Forages at all heights in interior and edges of forest, sometimes within 2 m of ground.
Breeding. Oct in Brazil (Rio Grande do Sul); nest found in Nov in Argentina. Nest purse-shaped, with a side entrance 3 cm wide, made entirely of mosses, suspended from branch within 1 m of ground in small arroyo. Clutch 2 eggs; incubation and fledging periods not recorded. No further information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Not well known; usually uncommon. Numbers may have declined towards S edge of range. Occurs in several national parks and other protected areas in all three countries which it inhabits. Apparently not entirely dependent on undisturbed forest; found also in secondary vegetation and edge habitat.
Bibliography. Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Castelino & Saibene (1989), Clay, Tobias *et al.* (1998), Cory & Hellmayr (1927), Darrieu (1987), Dubs (1992), Hayes (1995), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Pacheco *et al.* (1996), de la Peña (1988), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), da Silva (1996a), Stotz (1990b), Stotz *et al.* (1996), Teixeira *et al.* (1991), Traylor (1982), Willis & Oniki (1991), Zimmer (1955b).

4. Reiser's Tyrannulet

Phyllomyias reiseri

French: Tyranneau de Reiser **German**: Reiserkleintyrann **Spanish**: Mosquerito de Reiser

Taxonomy. *Phyllomyias reiseri* Hellmayr, 1905, Grotão, Piauí, Brazil.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that *P. fasciatus*, *P. griseocapilla* and *P. griseiceps* may be unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Appears to form a superspecies with *P. virescens* and *P. urichi*, and probably closest to latter; all were for long considered conspecific, but differences in morphology (plumage pattern, wing and tail proportions), degree of sexual dimorphism, habitat and voice evident. Has been suggested that *P. sclateri* also belongs in this group. Monotypic.
Distribution. EC Brazil (S Piauí to N Minas Gerais, S Goiás, Distrito Federal, E Mato Grosso do Sul) and EC Paraguay (Concepción).



Descriptive notes. 11·5 cm; 7-8 g. Bright yellow-green tyrannulet. Plumage is bright olive from forehead to rump, crown feathers faintly tipped greyish; lores, narrow supercilium and cheeks yellowish-white; wings dusky, two broad wingbars and edges of flight-feathers pale yellowish; tail dusky olive; throat and lower face whitish, underparts pale yellow, faintly streaked or washed with olive on breast and sides; iris pale brown; bill small and rounded, blackish, lower mandible pinkish to white with black tip; legs grey. Best distinguished from very similar *P. virescens* by slightly smaller size, usually yellowish ear-coverts without dusky or olive tips, in the hand also by shorter wing (male 54-59 mm, female 52-58 mm), shorter tail (male 49-58 mm, female 47-54 mm). Sexes alike. Juvenile resembles adult. VOICE. A series of rough, liquid notes moving down the scale, "briu-briu-briu-briu-briu-briu-briu".
Habitat. Tropical dry forest and gallery forest.
Food and Feeding. Little known. Apparently forages in canopy and along edges of dry to semi-deciduous forest trees.
Breeding. No data.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Poorly known. Uncommon and very local. Known from c. 15 widely dispersed localities in interior E Brazil and NE Paraguay, where it is found in gallery forest in the *cerrado* region and in subtropical, dry deciduous forests (N Minas Gerais). Recorded in Cavernas do Peruaçu National Park (Minas Gerais), in Brazil. Severe degradation, fragmentation and destruction of *cerrado* habitat has already taken place; if habitat destruction continues unabated, the conservation status of this species may have to be upgraded to that of Near-threatened.
Bibliography. Belton (1985), Clay, Tobias *et al.* (1998), Collar *et al.* (1994), Cory & Hellmayr (1927), Forrester (1993), Green (1997b), Hayes (1995), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Sick (1993, 1997), da Silva (1996a), Stotz (1990a), Stotz *et al.* (1996), Teixeira *et al.* (1991), Traylor (1982), Willis & Oniki (1991), Zimmer (1955b).

5. Urich's Tyrannulet

Phyllomyias urichi

French: Tyranneau d'Urich **German**: Urichkleintyrann **Spanish**: Mosquerito de Paria

Taxonomy. *Mecocerculus urichi* Chapman, 1899, Quebrada Seca, Sucre, Venezuela.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that *P. fasciatus*, *P. griseocapilla* and *P. griseiceps* may be unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Appears to form a superspecies with *P. virescens* and *P. reiseri*, and probably closest to latter; all were for long considered conspecific, but differences in morphology (plumage pattern, wing and tail proportions), degree of sexual dimorphism and habitat evident. Has been suggested that *P. sclateri* also belongs in this group. Monotypic.
Distribution. NE Venezuela: mountains in NE Anzoátegui, Sucre and N Monagas.
Descriptive notes. 11·5 cm. Plumage is bright olive from forehead to rump, crown feathers slightly tipped dusky to greyish; lores and narrow supercilium whitish; wings dusky, two broad wingbars and edges of flight-feathers pale yellowish-white; tail dusky olive; throat and lower face whitish, underparts pale yellow, faintly streaked olive on breast and sides; iris brown; bill small and rounded, blackish, lower mandible paler; legs grey. Perhaps indistinguishable in the field from *P. reiseri*. Sexes alike. Juvenile undescribed. VOICE. Not documented.



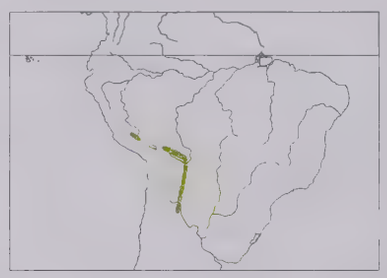
Habitat. Humid upper tropical montane forest; typically at 900-1100 m, occasionally down to 800 m.
Food and Feeding. Almost unknown. Observed to forage at forest edge, at mid-height in a tree 10-15 m tall; gleaned insect prey from underside of leaves while moving actively from branch to branch; tail not cocked.
Breeding. Unknown.
Movements. Presumed resident.
Status and Conservation. ENDANGERED. Rare. Range very small, c. 1000 km², and global population estimated at a few thousand individuals. Specimens from several sites in Cordillera de Caripe, but few (if any) recent observations; a recent sight record from Cerro Humo, in Paria Peninsula National Park. Also recorded in Cuevo del Guácharo National Park (N Monagas), recently expanded to include a further 500 km² of largely undisturbed forest. Habitat being rapidly destroyed owing to changing agricultural practices and conversion to plantations. Widespread clearance for agriculture and pasture has taken place in Cordillera de Caripe, even within protected areas; habitat in Cuevo del Guácharo National Park adversely affected by understorey removal for coffee-growing, illegal clearance and fires, and slopes of Cerro Negro now largely bare, with the more obvious "forested" patches being shade coffee plantations and only the mountaintop still covered in true forest. Conversion to commercial crops and plantations (coffee, mango, banana, orange, lemon) has occurred in remainder of Serranía de Turumiquire, but extensive forested areas remain. On Cerro Humo, increases in cash-crop agriculture, especially the cultivation of "ocumo blanco" (*Colocasia*), since middle to late 1980s, have resulted in uncontrolled burning and forest degradation. Much fieldwork is required in order to determine this little-known species' precise requirements and to set up effective programmes for its conservation.
Bibliography. Cory & Hellmayr (1927), Cracraft (1985), Gabaldón (1992), Hilty (2003), Kirwan & Sharpe (1999), Meyer de Schauensee & Phelps (1978), Phelps & Phelps (1950), Ridgely & Tudor (1994), da Silva (1996a), Stattersfield & Capper (2000), Stotz (1990a), Stotz *et al.* (1996), Teixeira *et al.* (1991), Traylor (1982), Zimmer (1955b).

6. Sclater's Tyrannulet

Phyllomyias sclateri

French: Tyranneau de Sclater **German**: Graubrust-Kleintyrann **Spanish**: Mosquerito de Sclater

Taxonomy. *Phyllomyias sclateri* Berlepsch, 1901, Bueyes, Santa Cruz, Bolivia.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that *P. fasciatus*, *P. griseocapilla* and *P. griseiceps* may be unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Present species formerly placed in a genus *Xanthomyias* along with *P. virescens*; has been suggested that it may belong in a superspecies formed by latter, *P. reiseri* and *P. urichi*. Proposed taxon *T. australis* is regarded as a synonym of present species. Two subspecies recognized.
Subspecies and Distribution.
P. s. subtropicalis (Chapman, 1919) - E Andes of SE Peru (Cuzco).
P. s. sclateri Berlepsch, 1901 - E Andes of Bolivia (La Paz S to Tarija) and NW Argentina (Jujuy S to Tucumán).



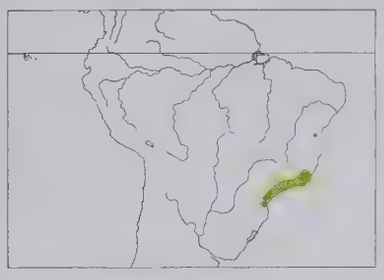
Descriptive notes. 11·5 cm. Is dull olive-green above, slightly more greyish on crown; lores and short supercilium whitish; wings dusky, two broad wingbars and conspicuous edges of flight-feathers very pale yellow to whitish; tail dusky olive; throat greyish-white, lower face grizzled whitish, breast pale grey, grading to pale yellowish on flanks and belly; iris brown; bill small and rounded, blackish, lower mandible slightly paler at base; legs grey. Sexes alike. Juvenile resembles adult. Race *subtropicalis* is more greyish-green above, supercilium wider, crown more pure grey, edges of flight-feathers white, underparts very pale, virtually lacking yellow suffusion. VOICE. Rapid series of harsh, sputtering notes.
Habitat. Humid montane forest and cloudforest; found also at edges, and often in clearings and lighter woodlands dominated by alder (*Alnus*). At 1500-2400 m in Peru and N Bolivia, and 400-1500 m in Bolivia and Argentina.
Food and Feeding. Insects. Forages actively in middle and upper levels of mossy forest, sometimes alone, often with mixed tanager (Thraupidae) flocks. Perches horizontally, and rapidly flicks wings while perch-gleaning from branches and leaves.
Breeding. Juvenile in Nov in Bolivia. Nest an open cup of twigs, lined with feathers, placed in epiphytes on elevated tree branch (Argentina). Clutch size and other details not documented.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Rare to fairly common; perhaps often overlooked. Regularly observed in Machu Picchu Historical Sanctuary (from near base, e.g. along lower part of Puente Ruinas-Machu Picchu Ruins road), in Peru; occurs also in Madidi National Park and Pilón Lajas Biosphere Reserve, in Bolivia.
Bibliography. Blendinger (1998), Bostwick & Zyskowski (2001), Canevari *et al.* (1991), Chapman (1917c, 1926), Cory & Hellmayr (1927), Cracraft (1985), Dinelli (1918), Fjeldså & Krabbe (1990), Hennessey, Herzog, Kessler & Robinson (2003), Hennessey, Herzog & Sagot (2003), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Olrog (1963, 1984), de la Peña (1988), Remsen & Traylor (1989), Ridgely & Tudor (1994), da Silva (1996a), Stotz *et al.* (1996), Traylor (1977, 1982), Walker (2001), Weske (1972), Zimmer (1941b).

7. Grey-capped Tyrannulet

Phyllomyias griseocapilla

French: Tyranneau à tête grise **Spanish**: Mosquerito Coronigrís
German: Graukappen-Kleintyrann

Taxonomy. *Phyllomyias griseocapilla* P. L. Sclater, 1862, presumably Rio de Janeiro, Brazil.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that present species may be closest to *P. fasciatus* and *P. griseiceps* and that all three perhaps unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Present species has been placed by some authors in genus *Oreotriccus*, which originally contained only *P. plumbeiceps*, but considered not allied to latter. Monotypic.
Distribution. E Brazil in SC Bahia and from Minas Gerais and Espírito Santo S to Santa Catarina.



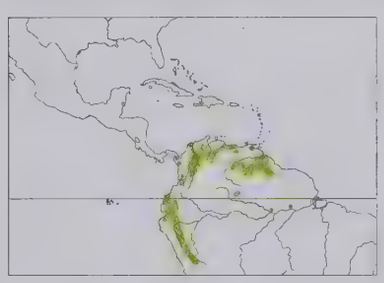
Descriptive notes. 11 cm. Plumage is bright olive-green above, slate-grey on crown and nape; narrow white loral spot, white area around eye; wings dusky, two wingbars and conspicuous edges of wing-coverts and flight-feathers bright yellow; tail dusky olive; lower face pale grey, throat greyish-white; breast pale grey, grading to whitish belly, flanks bright yellow-green; iris brown; bill small and rounded, blackish; legs grey. Sexes alike. Juvenile undescribed. Voice. A pair or short series of softly whistled "wheeuw" notes.
Habitat. Humid upper tropical forest and forest edges, including shrubby clearings and dense second growth; usually 750-1850 m, locally down to sea-level.
Food and Feeding. Insects; berries and small fruit, especially of mistletoe (Loranthaceae), also frequently eaten. Forages singly or in pairs, occasionally with mixed-species flocks, at lower levels than most of its congeners. Perch-gleans and hover-gleans.
Breeding. No information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Atlantic Forest Mountains EBA. Uncommon to relatively common, but patchily distributed; perhaps commoner at upper levels in the Serra do Mar and Serra de Paranapiacaba. Occurs in several protected areas, including Itatiaia National Park, Augusto Ruschi Biological Reserve and Intervales State Park; in the last-mentioned, although it was rarely observed around the Saibadela Research Station, it is more abundant at upper elevations within the park. Even within protected areas, forest areas continue to be lost through agricultural conversion, as well as mining, urbanization and industrialization, coupled with associated road-building.
Bibliography. Aleixo & Galetti (1997), Clay, Tobias *et al.* (1998), Collar *et al.* (1994), Cory & Hellmayr (1927), Develey (2004), Forrester (1993), Lanyon (1988b), Meyer de Schauensee (1982), Naka *et al.* (2000), Pacheco & Whitney (1995), Parker *et al.* (1996), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Traylor (1977), Venturini *et al.* (2001), Zimmer (1955b).

8. Sooty-headed Tyrannulet

Phyllomyias griseiceps

French: Tyranneau nain **German**: Rußkappen-Kleintyrann **Spanish**: Mosquerito Cabecigrís
Other common names: Crested/Sooty-crested Tyrannulet

Taxonomy. *Tyranniscus griseiceps* P. L. Sclater and Salvin, 1871, Pallatanga, Chimborazo and Babahoyo, Los Ríos, Ecuador.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that present species may be closest to *P. fasciatus* and *P. griseocapilla* and that all three perhaps unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Proposed races *cristatus* (Panama, N Colombia, N Venezuela), *caucae* (middle and upper Cauca Valley, in Colombia) and *pallidiceps* (SE Venezuela, S Guyana, N Amazonian Brazil, E Peru), described on basis of differences in length and colour of crown feathers and in wing length, considered unwarranted; variation in these characters at least as great among individuals from same regions as it is across huge geographical areas. Monotypic.
Distribution. Locally in E Panama, Colombia, Venezuela, Guyana, W & E Ecuador, E Peru (S to Ayacucho), and N Brazil (left bank of lower R Amazon).



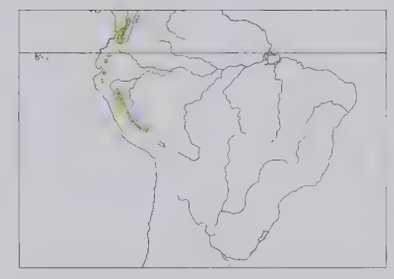
Descriptive notes. 10 cm; 8 g. A tiny, dull tyrannulet often showing slightly bushy crest. Plumage is dull greyish-olive above, darker greyish to blackish on crown, crown feathers of many individuals slightly elongated to form ill-defined crest; loral spot and narrow supercilium white, face grizzled whitish, narrow dark grey spot behind eye; wings dusky, indistinct narrow whitish edgings of wing-coverts and inner remiges (no wingbars); tail dusky; throat greyish-white, breast and flanks pale olive, grading to bright yellow on belly; iris dark brown; bill very small and rounded, black; legs black. Sexes alike. Juvenile undescribed. Voice. Song, often from exposed perch, an emphatic phrase of clear, short whistled notes, first one stressed, "whip, whip-di-irip" or "whit, whit-wheeu"; song may vary somewhat geographically, in Bolivia said to end with a rolling, descending trill.
Habitat. Humid tropical and upper tropical evergreen forest regions, occurring mainly in forest borders, clearings with scattered trees, partially cleared landscapes, also dry white-sand forests, plantations, even dry woodlots; generally not in primary forest. Mostly below 1200 m, occasionally to 1800 m; in lowlands, to 460 m, in E Venezuela, Guyana and Brazil.
Food and Feeding. Insects; also small fruits and berries. Forages in middle and upper canopy, usually alone except when visiting fruiting trees; occasionally with mixed-species flocks. Flits actively while perch-gleaning and making short upward sallies to hover-glean from leaves.
Breeding. Nest found in Feb in NW Ecuador, a small cup covered with lichen, in crotch of small branch 13 m above ground. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare to locally common, but probably often overlooked. Numerous in Tayrona National Park, in Colombia, and Río Palenque Science Centre and Tinalandia Private Reserve, both in NW Ecuador; occurs also in several other protected areas, including, among others, Darién National Park, in Panama, and Northwest Peru Biosphere Reserve, in Peru. Because of its relatively large range and tolerance of converted habitat, this species is not considered to be at any risk.
Bibliography. Anon. (1998a), Chapman (1917c, 1926), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Delgado (1985), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Miller (1963), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins & Ridgely (1990), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Traylor (1977), Walker *et al.* (2003), Wetmore (1972), Weske (1972), Zimmer (1930, 1941b).

9. Plumbeous-crowned Tyrannulet

Phyllomyias plumbeiceps

French: Tyranneau plombé **Spanish**: Mosquerito Coroniplomizo
German: Graukronen-Kleintyrann

Taxonomy. *Pogonotriccus plumbeiceps* Lawrence, 1869, "Bogotá", Colombia.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that *P. fasciatus*, *P. griseocapilla* and *P. griseiceps* may be unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Present species was for long placed in a separate genus, *Oreotriccus*, originally by itself and later with *P. griseocapilla*, but appears not to be close to latter. Monotypic.
Distribution. Locally in Andes from C Colombia (W & E cordilleras) S along E slopes to S Peru (S to Cuzco).



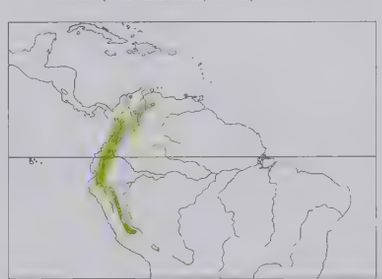
Descriptive notes. 11·5 cm. Plumage is bright olive above, with crown grey contrasting sharply with back; loral spot and narrow supercilium white, dark facial crescent bordered posteriorly by white; wings dusky, wingbars, edges of wing-coverts and broad edges of inner remiges yellow to yellowish-white; tail dusky olive; throat greyish-white, lower face grizzled whitish; breastband and flanks olive, grading to bright yellow on belly; iris dark brown; bill small and rounded, black; legs black. Sexes alike. Juvenile undescribed. Voice. Series of short, harsh notes, having quality of ovenbird (Furnariidae) voice, given at long intervals.
Habitat. Humid montane forest, especially wet, mossy cloudforest, at 1200-2200 m.
Food and Feeding. Poorly known. Insects and small fruits. Forages singly or in pairs, usually with mixed-species flocks. Perch-gleans or makes short hover-gleans in canopy. Sometimes lifts one wing over back.
Breeding. Not documented.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Rare to locally fairly common; probably often overlooked. Occurs in Tambito Nature Reserve (Cauca) and Ucumarí Regional Park, both in Colombia, and in all national parks on E Andean slope of Ecuador. Not uncommon in Machu Picchu Historical Sanctuary (e.g. along railway track between Puente Ruinas and Mandor Valley), in Peru.
Bibliography. Chapman (1917c, 1926), Cory & Hellmayr (1927), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hilty & Brown (1986), Miller (1963), Meyer de Schauensee (1982), Miller (1963), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robbins & Ridgely (1990), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Weske (1972), Zimmer (1930, 1941c).

10. Black-capped Tyrannulet

Phyllomyias nigrocapillus

French: Tyranneau à tête noire **Spanish**: Mosquerito Capirotado
German: Schwarzkappen-Kleintyrann

Taxonomy. *T[yrannulus] nigro-capillus* Lafresnaye, 1845, "Bogotá", Colombia.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that *P. fasciatus*, *P. griseocapilla* and *P. griseiceps* may be unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Present species was for long placed in latter genus. Three subspecies recognized.
Subspecies and Distribution.
P. n. flavimentum (Chapman, 1912) - Santa Marta Mts, in N Colombia.
P. n. nigrocapillus (Lafresnaye, 1845) - Andes of extreme W Venezuela, Colombia (except Santa Marta), W & E Ecuador and E Peru (S to Junín).
P. n. aureus (J. T. Zimmer, 1941) - Andes of W Venezuela (S Lara S to N Táchira).



Descriptive notes. 11·5 cm. Nominate race has white loral spot and narrow supercilium, dark facial crescent bordered posteriorly by white; crown dark grey to blackish, sharply contrasting with bright olive upperparts; wings dusky, yellow to yellowish-white wingbars and broad edges of inner remiges; tail dusky olive; throat greyish-white, lower face grizzled whitish; breastband and flanks olive, grading to bright yellow on belly; iris dark brown; bill small and rounded, black; legs black. Sexes alike. Juvenile undescribed. Race *flavimentum* has deep yellow lores and supercilium, much deeper yellow underparts lacking whitish chin, richer yellow wingbars; *aureus* has dusky grey-brown crown, more golden overtones throughout. Voice. Emphatic series of clear, high-pitched notes, "tzi-tzi-tzrr" or "peeep, peeeep", often repeated persistently.
Habitat. Humid montane forest, especially dense, mossy cloudforest and open, mossy woodlands and edges of clearings at upper elevations, even in stunted elfin forest near tree-line; also second growth. Mostly 1600-3400 m, rarely down to c. 1000 m; 1500-3000 in Venezuela.
Food and Feeding. Insects, small fruits. Forages alone or in pairs, usually with mixed-species flocks, in middle to upper parts of trees in densest parts of mossy forest. Very active, perches

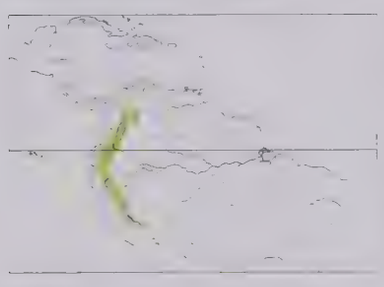
horizontally, tail often slightly cocked, flicks wings and pivots on perch while perch-gleaning in dense leaves and moss; occasionally hover-gleans, especially to pluck small berries.
Breeding. Birds with enlarged gonads in Mar-Nov in N Colombia. No other information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Rare to locally common, but perhaps often overlooked; apparently less numerous in S (Peru). Often most common near tree-line, and in S Ecuador particularly common along upper part of Loja-Zamora road. Can be found in majority of protected areas in its range. Tolerates converted habitat.
Bibliography. Allen (1998), Chapman (1917c, 1926), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Miller (1963), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robbins & Ridgely (1990), Salaman (1994), Stotz *et al.* (1996), Strewe & Navarro (2003), Traylor (1977), Weske (1972), Zimmer (1941b).

11. Ashy-headed Tyrannulet

Phyllomyias cinereiceps

French: Tyranneau à tête cendrée **German**: Ohrfleck-Kleintyrann **Spanish**: Mosquerito Cenizo

Taxonomy. *Tyrannulus cinereiceps* P. L. Sclater, 1860, Pallatanga, Chimborazo, Ecuador.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that *P. fasciatus*, *P. griseocapilla* and *P. griseiceps* may be unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Present species was for long placed in latter. Monotypic.
Distribution. Andes in extreme SW Venezuela (S Táchira), Colombia (all three cordilleras), W & E Ecuador and E Peru (S to Cuzco).



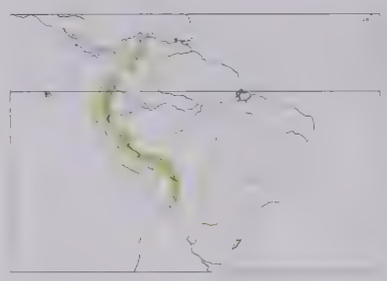
Descriptive notes. 11 cm; c. 10 g. Has slaty blue-grey crown sharply contrasting with bright olive back; lores and eyering white; face pattern distinctive, grizzled white and black, cheek patch yellowish, large black crescent on rear auriculars bordered posteriorly by yellow; wings dusky, two wingbars and edges of inner remiges broadly yellow; tail dusky olive; throat greyish-white, breast and flanks streaked or flammulated with olive, grading to bright yellow on belly; iris dark red; bill small and rounded, black; legs black. Sexes alike. Juvenile undescribed. Voice. Piercing and far-carrying, a high-pitched note followed by descending trill, "sweeeee, see-ee-ee-ee-eew".
Habitat. Humid upper montane forest, especially cloudforest, forest borders, also adjacent second growth. At 1400-2700 m; in Ecuador mostly 1350-2500 m, locally down to 900 m in S (El Oro).
Food and Feeding. Insects; probably also some small fruits. Forages in middle and upper levels of trees, usually with mixed-species flocks. Sits quietly for short periods, with slightly hunched posture, sometimes lifts one wing over head; flits quickly to new perch or hover-gleans from leaves or moss, sometimes hanging on leaves briefly to perch-glean; sometimes makes quick, short aerial sallies.
Breeding. Fledglings seen in Oct and Nov in Colombia. No other information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Rare to locally fairly common; probably often overlooked. More common in upper Magdalena Valley and Cueva de los Guácharos National Park, both in Colombia, and present in all national parks in humid Andean zones of Ecuador and Peru. Only three records from Venezuela, one in 1988 and two in 1996. Possibly occurs also in Bolivia (Madidi National Park).
Bibliography. Chapman (1917c, 1921, 1926), Cory & Hellmayr (1927), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Miller (1963), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robbins & Ridgely (1990), Salaman (1994), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Walker *et al.* (2003), Weske (1972), Zimmer (1941b).

12. Tawny-rumped Tyrannulet

Phyllomyias uropygialis

French: Tyranneau à croupion fauve **Spanish**: Mosquerito Culirrufo
German: Zimtbürzel-Kleintyrann

Taxonomy. *Mecocerculus uropygialis* Lawrence, 1869, Corazón, Pichincha, Ecuador.
Genus as presently constituted may be polyphyletic; objective phylogenetic analysis, using molecular characters as well as anatomical ones, is required in order to define generic limits. Anatomical evidence suggests that *P. fasciatus*, *P. griseocapilla* and *P. griseiceps* may be unrelated to others of genus, some or all of which possibly better placed in resurrected genus *Tyranniscus*. Present species was for long placed in latter. Monotypic.
Distribution. Very local in Andes of W Venezuela (Mérida), Colombia (S to Cundinamarca in E cordillera, in Cauca and Nariño in W), W & E Ecuador, and E slope in Peru (also three records on W slope), Bolivia (S to Tarija) and extreme NW Argentina (N Salta).
Descriptive notes. 11 cm; 8-9 g. A slightly crested, small tyrannulet. Has white lores and supercilium, dark brown crown, grading to brownish-olive on back; rump and uppertail-coverts bright cinnamon; wings dark brown, two bright buffy wingbars, edges of inner remiges broadly yellow, edges of outer remiges bright orange-buff; tail dusky, edged with buff; throat greyish-white, lower face greyish; breast and flanks olive-brown, grading to yellow to yellowish-white on belly; iris dark brown; bill small and rounded, black; legs black. Sexes alike. Juvenile undescribed. Voice. Inconspicuous 2-note "tseep-tseep" or "tzeep, zéé-u", singly or in series, especially early in morning.
Habitat. Upper montane humid forest, especially in thickets, edges of clearings, tree-line shrubbery, brushy washes, stunted elfin forest, and forest edges with *Chusquea* bamboo. At 2350-3000 m in Venezuela, 1500-2600 in Colombia, mostly 2100-3000 in Ecuador, and 1800-3000 m in SE Peru (2750 m in Arequipa, on W slope).
Food and Feeding. Insects; probably some small fruits. Forages actively, usually in pairs or small family groups with mixed-species flocks, in canopy or upper parts of dense shrubs. Perches



upright; feeds in manner of a parulidae warbler, with perch-gleans and short upward hover-gleans.
Breeding. Fledgling observed in Dec in Bolivia. No other information.
Movements. Mainly resident, but possibly some seasonal movements to slightly lower elevations; the three records on W slope of Peruvian Andes may represent wandering individuals.
Status and Conservation. Not globally threatened. Rare to locally fairly common; most common in Bolivia. Regular near Hotel Los Frailes (Mérida), in Venezuela; occurs in several protected areas throughout range, including four national parks in Ecuador and probably all national parks from N Peru (Abiseo, in San Martín) S to Bolivia (Carrasco); in Argentina, recorded only in Baritú National Park (N Salta). Has relatively large range, within which it exhibits tolerance of degraded habitats; unlikely to become threatened in immediate future.
Bibliography. Allen (1998), Chapman (1917c, 1926), Cory & Hellmayr (1927), Davies *et al.* (1994), Di Giacomo (1995), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Miller (1963), Remsen (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robbins & Ridgely (1990), Salaman (1994), Sharpe *et al.* (2001), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Walker *et al.* (2003), Weske (1972), Zimmer (1930, 1941b).

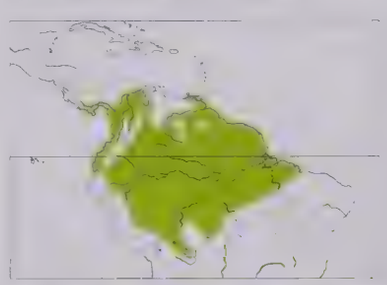
Genus *TYRANNULUS* Vieillot, 1816

13. Yellow-crowned Tyrannulet

Tyrannulus elatus

French: Tyranneau roitelet **German**: Gelbscheitel-Olivtyrann **Spanish**: Mosquerito Coronado

Taxonomy. *S[ylvia] elata* Latham, 1790, Cayenne.
Monotypic genus, in many respects transitional between *Phyllomyias* and *Myiopagis*, but anatomical evidence suggests closer relationship to latter. Birds from Panama named as race *panamensis* and birds from N Bolivia as *benii*; in examination of large series of specimens, however, both considered indistinguishable from other populations. Monotypic.
Distribution. Extreme S Costa Rica, Panama, and forested South American lowlands S to WC Ecuador and, E of Andes, from Colombia, Venezuela, the Guianas and Amazonian Brazil (E to Maranhão) S to E Peru and N Bolivia.



Descriptive notes. 10-11 cm; 6·5-8 g. A stubby-billed tyrannulet that is heard far more often than it is seen. Male has slate-grey to dark brown or blackish crown, long bright yellow to orange-yellow coronal stripe (semi-concealed), greyish supercilium; bright olive-green above, wings dusky, two wingbars and indistinct edges of wing-coverts and flight-feathers white to yellowish-white; tail dusky olive, may appear pale-tipped when plumage fresh; throat and face pale grey, underparts pale to medium yellow, breast suffused with olive; iris brown; bill very short and rounded, all black; legs grey. Female is smaller than male, slightly paler above, paler grey crown, paler coronal stripe. Juvenile resembles adult. Voice. Distinctive, easily heard, brief disyllabic call, first note higher and second slightly slurred downwards, "wher-dear" or "pee-dear" ("three bears"), delivered singly at intervals of up to many minutes, often throughout heat of day when few other birds singing.
Habitat. Humid lowland evergreen forest, especially in second growth, forest edges, lighter woodland, shrubby clearings, also coffee or citrus plantations, gardens and parks; also high in canopy of primary forest (sometimes calling from near tops of emergent trees). Lowlands and foothills, to c. 1200 m.
Food and Feeding. Insects and variety of small fruits; recorded foods include *Capsicum* and, especially, mistletoe (Loranthaceae) berries. Forages mainly solitarily or in pairs, only rarely occurring in mixed-species flocks. Perches upright, tail not cocked; perch-gleans and makes short hover-gleans to snatch food items, mainly in outer edges of canopy.
Breeding. Mar-Aug in Panama and Jan-Sept in Colombia. Nest (Panama) a simple, shallow cup 4 cm in diameter, 1 cm deep, made of fine twigs, plant fibre and hair-like filaments, some hanging below nest, placed 8-20 m up on narrow twig or at origin of multiple sprouts from twig, exterior of cup sometimes decorated with numerous small mistletoe seeds regurgitated by female immediately after returning from foraging bouts; nest territory vigorously defended by male against intruding Palm Tanager (*Thraupis palmarum*). Clutch 1 or 2 eggs; incubation evidently by female only; no information on duration of incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to common. Occurs in many national parks and other protected areas throughout its large range. Tolerates degraded and disturbed habitats, and also occurs in artificial habitats, such as plantations and gardens. May be expanding its range N in Central America as a consequence of deforestation.
Bibliography. Anon. (1998a), Bates & Parker (1998), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Davidar (1987), Friedmann (1948), Gilliard (1941), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Hosner (2004), Naka (2004), Oren & Parker (1997), Peres & Whittaker (1991), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson & Terborgh (1997), Schulenberg *et al.* (2001), Sick (1993, 1997), Snethlage (1935), Snyder (1966), Stiles (1985), Stiles & Skutch (1989), Stiles & Smith (1980), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977), Walther (2004), Wetmore (1972), Willis (1980), Zimmer (1941c).

PLATE 17 ➤



PLATE 17

inches 4

cm 10

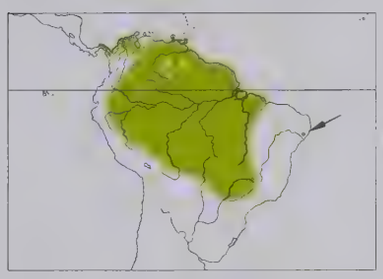
Genus *MYIOPAGIS* Salvin & Godman, 1888

14. Forest Elaenia

Myiopagis gaimardii

French: Élénie de Gaimard **German**: Weißscheitel-Olivtyrann **Spanish**: Fiofío Selvático

Taxonomy. *Muscicapara Gaimardii* d'Orbigny, 1840, Yuracarés, Cochabamba, Bolivia.
Was once placed in its own genus, *Elainopsis*, and moved to the family Cotingidae on basis of its incomplete tarsal envelope. Proposed race *subcinerea* (EC Brazil from lower Amazon Basin E to Maranhão and Goiás) treated as a synonym of nominate; intergrades broadly with latter and with *guianensis*, and most individuals cannot be reliably distinguished from either. Five subspecies currently recognized.
Subspecies and Distribution.
M. g. macilvainii (Lawrence, 1871) - Panama (E of Canal Zone) and Caribbean coast of Colombia (E to base of Santa Marta Mts).
M. g. bogotensis (Berlepsch, 1907) - NE Colombia (from N Santa Marta Mts) E to N Venezuela (W Zulia E to Sucre, S to Barinas, Apure and R Orinoco).
M. g. trinitatis (Hartert & Goodson, 1917) - Trinidad.
M. g. guianensis (Berlepsch, 1907) - E Amazonian Colombia, S & SE Venezuela (S of R Orinoco) and the Guianas S to N Amazonian Brazil and extreme NE Peru (Loreto).
M. g. gaimardii (d'Orbigny, 1840) - E Ecuador, E Peru, S Amazonian Brazil (E to W Pará, also Alagoas, S to W Mato Grosso, W São Paulo and Goiás) and N Bolivia.



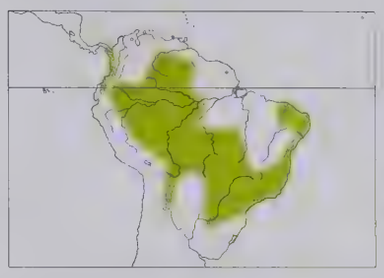
Descriptive notes. 12-12·5 cm; 12-13 g. Small, with elongated crown feathers forming slight bushy crest. Nominate race has indistinct whitish loral spot and supercilium, narrow whitish broken eyering; crown dark grey, semi-concealed white coronal patch; upperparts olive, wings dusky, two conspicuous wingbars and outer webs of inner remiges pale to bright yellow; throat whitish, face grizzled white; breast broadly flammulated olive, grading to bright yellow on belly; iris dark brown; bill short, black; legs grey. Sexes alike. Juvenile not described. Races vary mainly in colour of upperparts and concealed crown patch: *guianensis* is very similar to nominate, but slightly darker olive above; *bogotensis* is paler, brighter green above, with suffusion of pale yellow in crown patch; *macilvainii* has bright yellow crown patch; *trinitatis* is significantly larger than others, has more extensive whitish throat, broader grey breast. Voice. Short, upward-inflected, disyllabic "pitchueeet", typically as isolated calls or separated by intervals of 30 seconds or more; often calls throughout day.
Habitat. Tropical lowland evergreen forest, forest borders, gallery forest and, to lesser extent, deciduous forest and secondary woodland; often found in emergent trees, and in association with forest openings such as treefall gaps, small streams and small clearings. Mainly below 1000 m, but recorded to 1500 m.
Food and Feeding. Insects; berries and small fruit also eaten. Forages usually very high in forest canopy; often, but not always, with mixed-species flocks. Perches both upright and somewhat horizontally, often cocks tail slightly; often inactive, changing perches infrequently by flitting short distances. Perch-gleans and hover-gleans in foliage and twigs. Of 75 food captures observed in tall deciduous forest in N Venezuela, 35% involved upward hover-gleaning, 11% downward hover-gleaning, 3% upward strikes, 3% downward strikes, 34% perch-gleaning; small fruit taken in 16% of cases.
Breeding. Nest found in Feb in Panama; breeds Mar-Sept in Colombia and Feb-Sept in Trinidad. Nest (Panama) a cup of grass and moss, decorated with lichens, 3-5 m up in fork of tree branch. Clutch 2 eggs; incubation and fledging periods not known.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common in much of range, but easily overlooked unless voice known; difficult to locate in forest canopy and heard much more often than it is seen. Occurs in many national parks and other protected areas throughout its large range. Much of this species' habitat remains in relatively good condition, and it is not considered likely to become threatened within the immediate future.
Bibliography. Anon. (1998a), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Delgado (1985), Dubs (1992), ffrench (1991), Fitzpatrick (1980c), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Munn (1985), Oren & Parker (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson & Terborgh (1997), Schulenberg *et al.* (2001), Sick (1993, 1997), Silveira *et al.* (2003), Stotz *et al.* (1996), Temple (2002), Tostain *et al.* (1992), Traylor (1977), Walther (2004), Wetmore (1972), White (2002), Willis (1980), Zimmer (1941a).

15. Grey Elaenia

Myiopagis caniceps

French: Élénie grise **German**: Grautyrann **Spanish**: Fiofío Gris
Other common names: Bananal Tyrannulet ("*Serpophaga araguayae*")

Taxonomy. *Tyrannula caniceps* Swainson, 1835, Santo Amaro, Reconcavo da Bahia, Brazil.
Apparently closely related to *M. olallai*, but also suggested by some as possibly not belonging in present genus on grounds of sexual plumage dimorphism. Described taxon *Serpophaga araguayae*, based on a single specimen from SW Tocantins (Bananal I), in Brazil, shown to be referable to nominate race of present species. Four subspecies recognized.
Subspecies and Distribution.
M. c. absita (Wetmore, 1963) - E Panama.
M. c. parambae (Hellmayr, 1904) - Chocó region of W Colombia and NW Ecuador.
M. c. cinerea (Pelzeln, 1868) - E Colombia E through NW & S Venezuela (Zulia, Bolívar, Amazonas) to SW Guyana and French Guiana, and S through E Ecuador, E Peru and W Amazonian Brazil (E to R Purus) to N Bolivia.
M. c. caniceps (Swainson, 1835) - NE, S & SE Brazil (Ceará, Alagoas, and from S Mato Grosso and Maranhão S to São Paulo and Rio Grande do Sul), Paraguay, S Bolivia (Tarija) and extreme NW & NE Argentina.



Descriptive notes. 12-12·5 cm; 10-11 g. Sexually dimorphic elaenia, local populations extremely variable. Male nominate race has narrow white crown patch (concealed), indistinct whitish loral spot; forehead to hindneck medium-grey, becoming more olive-grey on upperparts; wings black, two conspicuous wingbars and outer webs of inner remiges white; tail greyish; face grizzled whitish, throat white, breast pale grey, belly greyish-white; iris dark brown; bill short and rounded, blackish; legs grey. Female is bright greenish-olive above, crown and nape medium grey, concealed crown patch pale yellow; wings as male but wingbars and edges of remiges pale to bright yellow; face grizzled greyish-white, throat and breast pale grey, rest of underparts greyish-white, faintly washed pale yellow. Immature male resembles female. Race *cinerea* is similar to nominate, but male more blue-grey, white markings on wings broader, bill larger, female brighter green above, underparts pale greenish-yellow to bright yellow, wing markings yellower and more extensive; *parambae* resembles previous but much smaller, female has coronal patch white; *absita* is paler, with more extensive white on wing, female has paler yellow underparts. Voice. A very fast, high series of notes, trailing off into descending trill; also high-pitched single or double "wheep", an excited "e-e-e-e-pitchew pitchew-peechew", and a buzzy call of 2-3 notes.
Habitat. Tropical lowland evergreen forest and borders of humid forest, both *terra firme* and *várzea*. Mainly in foothills in Panama; from sea-level to 1200 m in other parts of range.
Food and Feeding. Insects, also small fruits. Normally forages high above ground in treetops and outer canopy foliage, often with mixed-species flocks. Posture erect or horizontal; often cocks tail slightly. Perch-gleans and hover-gleans among foliage and twigs.
Breeding. Sept-Jan in S Brazil and Argentina. Nest (Argentina) a neat cup 7·5 cm in diameter, 4 cm high, composed of vegetable fibres, decorated on exterior with lichens, placed 7 m above ground in crotch of large branch. Clutch 2 eggs; incubation and fledging periods not recorded.
Movements. Resident in N; some withdraw from extreme S parts of range during austral winter. Probable migrant recorded in extreme NW Venezuela (Zulia).
Status and Conservation. Not globally threatened. Rare to locally uncommon; often difficult to see, and rather few records in many countries in its range, but easily overlooked unless voice known. Occurs in many national parks and other protected areas throughout its range, e.g. from Darién National Park, in Panama, and Alto Orinoco-Casiquiare Biosphere Reserve, in Venezuela, S to Caaguazú National Park, in Paraguay, and Iguazú National Park, in Argentina. Large areas of suitable habitat within the species' range remain relatively undisturbed.
Bibliography. Anon. (1998a), Bates & Parker (1998), Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Cohn-Haft *et al.* (1997), Collar & Andrew (1988), Cory & Hellmayr (1927), Darrieu (1987), Delgado (1985), Dubs (1992), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Lowen *et al.* (1996), Meyer de Schauensee (1982), Naka (2004), Pacheco & Laps (2001), de la Peña (1988), Peres & Whittaker (1991), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), da Silva (1990), Stotz *et al.* (1996), Teixeira *et al.* (1988), Traylor (1977), Walther (2004), Wetmore (1972), Zimmer (1930, 1941a).

16. Foothill Elaenia

Myiopagis olallai

French: Élénie d'avant-monts **German**: Vorgebirgs-Olivtyrann **Spanish**: Fiofío Submontano

Taxonomy. *Myiopagis olallai* Coopmans and Krabbe, 2000, River Bambuscaro, Zamora-Chinchipe, Ecuador.
Probably most closely related to *M. caniceps*. Monotypic.
Distribution. Locally in E Andes of N & S Ecuador and in SC Peru (Cordillera Vilcabamba, in Ayacucho).



Descriptive notes. 12-12·5 cm; 11-14 g. Has dark pearly grey crown with large white coronal patch (semi-concealed), whitish-mottled lores, eyering and subocular region; upperparts olive; wings dusky, washed olive on coverts, three conspicuous wingbars and outer webs of inner remiges bright yellow; tail grey-brown; throat whitish, underparts bright yellow, breast broadly flammulated olive; iris dark brown; bill short, black, base of lower mandible brownish-grey; legs black. Sexes alike. Juvenile undescribed. Voice. Long, harsh trill distinctly rising in pitch, lasting c. 2 seconds, preceded by variable number of introductory notes.
Habitat. In and around edge of very humid to wet submontane primary forest, at elevations of 890-1500 m.
Food and Feeding. Diet unknown; probably insects and some berries. All observations relate to pairs accompanying mixed-species flocks at canopy and middle levels of forest. While foraging, perches horizontally, often with tail cocked; generally very active, making short upward or outward sallies, briefly hover-gleaning from tops and undersides of foliage, moss, twigs and branches. Calls and sings frequently while perched vertically at tip of a branch 2-15 m from ground.
Breeding. No information.
Movements. No information.

On following pages: 17. Pacific Elaenia (*Myiopagis subplacens*); 18. Yellow-crowned Elaenia (*Myiopagis flavivertex*); 19. Jamaican Elaenia (*Myiopagis cotta*); 20. Greenish Elaenia (*Myiopagis viridicata*); 21. Caribbean Elaenia (*Elaenia martinica*); 22. Yellow-bellied Elaenia (*Elaenia flavogaster*); 23. Large Elaenia (*Elaenia spectabilis*); 24. Noronha Elaenia (*Elaenia ridleyana*); 25. White-crested Elaenia (*Elaenia albiceps*); 26. Small-billed Elaenia (*Elaenia parvirostris*); 27. Olivaceous Elaenia (*Elaenia mesoleuca*).

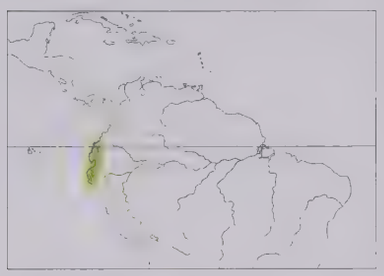
Status and Conservation. Not globally threatened. Recently discovered species. In Ecuador, recorded in Napo and Zamora-Chinchipe, and, more recently, in foothills of W Andean slopes in Sucumbíos (Serranías Cofán), where it is uncommon; in Peru, recorded at three localities in foothills of E slopes, in Ayacucho. Occurs in Sumaco-Galeras and Podocarpus National Parks, in Ecuador, but at lower elevations where threat of deforestation by human settlers most imminent. Forests within this species' elevational range are disappearing at an alarming rate along much of E Andean slopes. On the other hand, it is found also in superwet forest, where human pressure hitherto more moderate. Fieldwork needed in order to determine the species' true status and its ecological requirements.
Bibliography. Anon. (2000c), Coopmans & Krabbe (2000), Green (2002a), Van Loon (2001).

17. Pacific Elaenia

Myiopagis subplacens

French: Élénie striée **German**: Weißbrauen-Olivtyrann **Spanish**: Fiofío del Pacífico

Taxonomy. *Elainea* [sic] *subplacens* P. L. Sclater, 1862, Pallatanga, Chimborazo, Ecuador.
Possibly close to *M. viridicata*. Monotypic.
Distribution. W Ecuador (S from Esmeraldas, including Puná I) and NW Peru (Tumbes, W Piura).



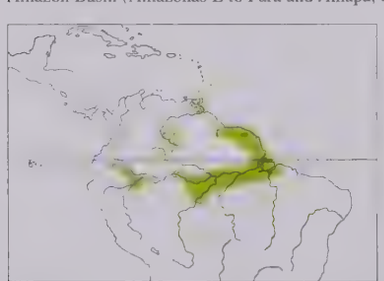
Descriptive notes. 13·5 cm. Has grey-brown crown, large bright yellow coronal patch (semi-concealed); indistinct whitish lores, broad white supercilium extending downwards behind blackish auricular region, narrow broken whitish eyering; upperparts brownish-olive; wings dusky, two yellowish wingbars (indistinct to nearly absent), outer webs of inner remiges pale yellow; tail greyish-olive; face grizzled whitish, throat and breast flammulated pale greyish-white, rest of underparts pale yellow; iris dark brown; bill short, blackish, base of lower mandible paler; legs grey. Sexes alike. Juvenile undescribed. Voice. Sharply delivered "cheer-woorr-it!"; dawn song "chrrr, chrrr, che-wik" repeated over and over.
Habitat. Lower growth and borders of deciduous forest, semi-humid gallery forest and woodland, and secondary scrub; lowlands and foothills, to 1750m. Avoids humid forest.
Food and Feeding. Little known. Usually solitary; seldom joins mixed-species flocks. Quiet and inconspicuous; perches upright.
Breeding. No information.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tumbesian Region EBA. Uncommon to fairly common. Numbers have declined as a result of widespread deforestation, but still fairly common in several forested regions, such as Chongón Hills (W of Guayaquil) and Machalilla National Park, in Ecuador, where also recorded in Cerro Blanco Forest Reserve, Loma Alta Ecological Reserve and Río Palenque Scientific Station. Occurs in Northwest Peru Biosphere Reserve. Forest habitats within Tumbesian region are being rapidly destroyed, degraded and fragmented by clearance, and by understorey disturbance resulting from timber extraction and livestock grazing. In W Ecuador below 900 m, 57% of forest was lost per decade from 1958 to 1988, and virtually all lowland forest outside protected areas likely soon to be destroyed; at higher elevations, deforestation has been slower and a greater proportion of forest survives, but overall still less than 5% of original forest cover remains, mostly on inaccessible slopes. Even nominally protected areas are subject to logging, grazing, illegal settling and habitat clearance.
Bibliography. Best & Clarke (1991), Cory & Hellmayr (1927), Lanyon (1988b), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977), Williams & Tobias (1994), Zimmer (1941a).

18. Yellow-crowned Elaenia

Myiopagis flavivertex

French: Élénie à couronne d'or **Spanish**: Fiofío Coroniamarillo
German: Goldscheitel-Olivtyrann

Taxonomy. *Elainea* [sic] *flavivertex* P. L. Sclater, 1887, near Cachiboya, upper Ucayali, Peru.
Probably most closely related to *M. viridicata*. Monotypic.
Distribution. Very locally in NE & S Venezuela (NE Monagas S to Delta Amacuro, Amazonas), the Guianas, NE Ecuador (Sucumbíos, N Napo), NE Peru (E Loreto) and C Brazil along middle Amazon Basin (Amazonas E to Pará and Amapá, S to N Rondônia).



Descriptive notes. 12·5-13 cm; 12 g. Has dark brownish-olive crown, large bright yellow coronal patch (semi-concealed); indistinct whitish loral spot and supercilium; upperparts olive; wings dusky olive, two conspicuous wingbars and outer webs of inner remiges bright yellow; face and throat whitish, breast olive-washed yellow, rest of underparts bright yellow; iris dark brown; bill short, blackish, base of lower mandible pinkish; legs grey. Sexes alike. Juvenile undescribed. Voice. Distinctive, loud "jéw, jee-jee-jew" or "wéechéché-e-e-e", sometimes in faster, longer series of notes, given singly and intermittently.
Habitat. Lower and middle growth of *várzea* and flooded, swampy forest, sometimes in flooded forest in sandy-soil areas; at elevations of up to 300 m (tropical zones).
Food and Feeding. Insects recorded. Found singly or as loosely associated pair; rarely with mixed-species flocks. Perches upright, remains relatively still for long periods; occasionally sallies short distances to glean insects among foliage.
Breeding. No information.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common; not well known, but overlooked unless voice known. Generally very localized in occurrence; e.g. in Ecuador, found along R Aguarico, R Lagarto, R Napo (including La Selva and Yuturi Lodges) and R Pacuyacu, and fairly common at Cuyabeno. Occurs in several protected areas, including Anavilhanas Ecological Station, in Brazil.
Bibliography. Bangs & Penard (1918), Cory & Hellmayr (1927), Gyldenstolpe (1950), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Lanyon (1988b), Meyer de Schauensee (1982), Novaes (1978a), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1993, 1997), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977), Zimmer (1941a).

19. Jamaican Elaenia

Myiopagis cotta

French: Élénie de la Jamaïque **German**: Weißkehl-Olivtyrann **Spanish**: Fiofío Jamaicano
Other common names: Jamaican Yellow-crowned Elaenia, Yellow Elaenia

Taxonomy. *Elania cotta* Gosse, 1849, Jamaica.
Closely related to, and considered by some to be conspecific with, *M. viridicata*. Monotypic.
Distribution. Jamaica.



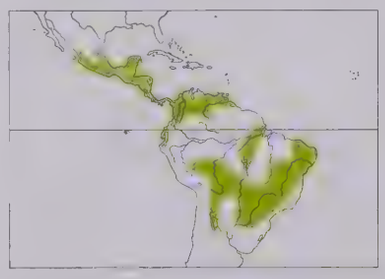
Descriptive notes. 12-12·5 cm; 12-13 g. Plumage is greenish-olive above, crown slightly darker and with feathers slightly elongated, concealing bright orange-yellow coronal patch; whitish lores and supercilium bordered below by darkish line through eye; wings dusky olive, outer webs of inner remiges edged pale yellow; tail dusky olive; throat whitish, face grizzled white; breast pale yellow, rest of underparts bright yellow; iris dark brown; bill short, black; legs blackish. Sexes alike. Juvenile lacks coronal patch, has pale grey underparts, yellower on belly. Voice. Rapid, high-pitched "ti-si-si-sip".
Habitat. Open woodland, forest edge, second-growth forest, scrubland, shade coffee plantations, and dry forest; from sea-level to mountains, to 2000 m. Most frequent in wet forest at middle elevations.
Food and Feeding. Insects; rarely, fruits. Forages from understorey to canopy, but typically 4-8 m above ground. Sallies from perch, gleans items from vegetation while in flight.
Breeding. Mar-Jun. Nest a well-formed cup of plant materials, hidden in foliage. Clutch 3 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Jamaica EBA. Uncommon but widespread. In Jamaica, 75% of original forest cover has already been cleared, and remaining forest is largely second growth; undisturbed forest survives only on high, steep mountain slopes, some of which are protected in Blue Mountain and John Crow National Park, but hunting and habitat destruction continue because of lack of funds for protection and management. Resurgence in coffee cultivation since 1980 has led to clearance of much second growth, and other problems for remaining forests include hurricane damage, widespread pesticide use, establishment of pine (*Pinus*) plantations, timber removal, deliberate fires, and continuing conversion for small-scale farming and urbanization.
Bibliography. Anon. (1998a), Bond (1985), Cory & Hellmayr (1927), Faaborg (1985), Lanyon (1988b), Pregill *et al.* (1991), Raffaele *et al.* (1998, 2003), Ridgway (1907), Stotz *et al.* (1996), Traylor (1977).

20. Greenish Elaenia

Myiopagis viridicata

French: Élénie verdâtre **German**: Grüntyrann **Spanish**: Fiofío Verdoso

Taxonomy. *Sylvia viridicata* Vieillot, 1817, Paraguay.
Closely related to *M. cotta*, which is considered conspecific by some. Possibly also close to *M. subplacens*. Races *pallens*, *zuliae* and *restricta* differ minimally from *accola*, perhaps better merged with last. Ten subspecies tentatively recognized.
Subspecies and Distribution.
M. v. jaliscensis Nelson, 1900 - W Mexico (Nayarit and Zacatecas S to Guerrero).
M. v. minima Nelson, 1898 - Tres Marias Is, off Nayarit (Mexico).
M. v. placens (P. L. Sclater, 1859) - E Mexico (Veracruz S to Yucatán Peninsula, and Cozumel I), Caribbean slope of Guatemala and E Honduras.
M. v. pacifica (Brodkorb, 1943) - Pacific slope from S Mexico (Chiapas) S to W Honduras.
M. v. accola Bangs, 1902 - Nicaragua S to N & NW Colombia and NW Venezuela (Táchira).
M. v. pallens Bangs, 1902 - N Colombia (Santa Marta region, Cundinamarca, Huila).
M. v. zuliae J. T. Zimmer & Phelps, Sr, 1955 - foothills of Sierra de Perijá in extreme N Venezuela.
M. v. restricta Todd, 1952 - coastal mountains and lowlands of Venezuela (E of Andes, N of Amazon Basin), also Guyana.
M. v. implacens (P. L. Sclater, 1862) - SW Colombia (Nariño), W Ecuador (S to Loja) and extreme NW Peru.
M. v. viridicata (Vieillot, 1817) - SE Peru, N Bolivia, SC, E & SE Brazil, Paraguay, and NW & NE Argentina (S to Tucumán, Formosa and Corrientes).



Descriptive notes. 13·5 cm; 12-14 g. Male nominate race is greenish-olive above, crown faintly tinged greyish, feathers slightly elongated, yellow to yellow-orange coronal patch (semi-concealed); indistinct whitish supercilium, narrow broken white eyering, darker loral stripe; wings dusky, wing-coverts and outer webs of inner remiges indistinctly edged pale yellowish-white (no obvious wingbars); tail dusky olive; throat pale grey to whitish, face grizzled white; breast greyish, broadly flammulated olive, rest of underparts pale yellow; iris dark brown to reddish-brown; bill short, blackish, lower mandible flesh-coloured at base; legs dark grey. Female is slightly smaller, has paler crown patch. Juvenile has brownish head and upperparts, lacks crown patch, has wing-coverts tipped brownish, throat tinged buffy, underparts paler yellow. Races vary in body size, bill size, overall richness of colour, and relative

colour of upperparts and crown: *jaliscensis* is palest overall, small-billed; *minima* is unusually small; *placens* is brighter green above; *pacifica* is duller olive above, paler below; *accola* has larger bill, slightly greener upperparts; *pallens* is extremely similar to previous, but on average slightly paler above and below; *restricta* is somewhat larger than last; *zuliae* has deeper, more brilliant yellow abdomen, brighter green (less brownish) back and rump; *implacens* is significantly smaller than last three, has side of crown dull blackish, back richer green, edges of wing-coverts and remiges brighter yellowish. Voice. High-pitched, rather weakly slurred, buzzy or reedy, descending disyllabic call, "sleeeryip" or "cheee-e" or "squeewzit", or "peeeur"; also thin "tzeeeu" or "skzeet". Highly variable dawn song, most often a thin "chew-er-ee-u" or "peer-weedyum", repeated endlessly every 2-3 seconds, sometimes becoming more excited and varied; also more lisping "see-ee, seer, seer", repeated.

Habitat. Humid tropical evergreen forest regions, but prefers lighter growth, especially near streams and clearings, including deciduous and semi-deciduous woodlands, older second growth forest, citrus and coffee plantations, gallery forest, and tall scrub. Mostly sea-level to 1100 m, occasionally to 1500 m; to 2500 m in Middle America.

Food and Feeding. Various insects; wide variety of small berries, fruits and arillate seeds also regularly eaten. Forages singly, or as widely separated pair-members; only rarely with mixed-species flocks. At all levels from lower mid-storey to canopy of forest and tall scrub, most often high in crowns of trees. Perches upright, usually rather quietly, and for long periods (30-45 seconds), inconspicuous; makes short aerial sallies and hover-gleans.

Breeding. Apr-Jun in Middle America, Oct-Mar in Brazil, three nests Dec-Jan in Argentina. Nest built by female, guarded by male, a very thin, shallow cup made of vine tendrils, rootlets and spider silk, attached by rim in fork or saddled in leaf axil 4-10 m above ground in tree; so thin that eggs visible from below through nest bottom. Clutch 2 eggs; incubation and fledging periods not documented.

Movements. Mainly resident; some winter stragglers occur on offshore and Caribbean islands, and recorded once in S USA. Populations in extreme S, in SE Brazil (Rio Grande do Sul), apparently absent in non-breeding season, suggesting that at least some N movement occurs.

Status and Conservation. Not globally threatened. Uncommon to common; often overlooked. Occurs in many national parks and other protected areas throughout its range, from Middle America S to Argentina. Does not require primary forest; has adapted to secondary habitats and tolerates moderate levels of disturbance. Much suitable habitat remains, and this species is not considered likely to become threatened in near future.

Bibliography. Anon. (1998a), Belton (1985), Binford (1989), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Cracraft (1985), Darrieu (1987), Di Giacomo (2004), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Land (1970), Lee Jones (2004), Lowen *et al.* (1996), Mees (2000), Monroe (1968), Morgan & Feltner (1985), Narosky & Salvador (1998), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robinson & Terborgh (1997), do Rosário (1996), Rowley (1962), Sick (1993, 1997), Skutch (1981), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Traylor (1977), Wetmore (1972), Willis (1988), Wright *et al.* (1985), Zimmer (1941a).

Genus *ELAENIA* Sundevall, 1836

21. Caribbean Elaenia

Elaenia martinica

French: Élénie siffleuse **German**: Weißkinn-Olivtyrann **Spanish**: Fiofío Caribeño
Other common names: Chinchorro Elaenia (*chinchorrensis*)

Taxonomy. [*Muscicapa*] *martinica* Linnaeus, 1766, Martinique.

Probably a Caribbean sister-taxon of *E. chiriquensis*. Race *chinchorrensis* considered possibly a separate species by some authors. Seven subspecies recognized.

Subspecies and Distribution.

E. m. remota Berlepsch, 1907 - islands off Quintana Roo (Cozumel, Holbox, Meco, Mujeres, Culebra Cay), in SE Mexico.

E. m. chinchorrensis Griscom, 1926 - Chinchorro Bank (Great Cay), off Quintana Roo (SE Mexico), and outermost cays off Belize (Half-moon Cay, Middle Cay, Glover's Reef).

E. m. cinerescens Ridgway, 1884 - islands of Old Providence, St Andrew's and Santa Catalina, E of Honduras.

E. m. caymanensis Berlepsch, 1907 - Cayman Is.

E. m. riisii P. L. Sclater, 1860 - Puerto Rico and offshore islands (Culebra, Culebrita, Vieques, Southwest Cay), Virgin Is, Anguilla, St Martin, St Bartholomew, Antigua and Barbuda, and Netherlands Antilles (Aruba, Curaçao, Bonaire).

E. m. martinica (Linnaeus, 1766) - Lesser Antilles from Saba and St Eustatius S to Grenada (probably excluding Grenadines).

E. m. barbadensis Cory, 1888 - Barbados.



Descriptive notes. c. 16-18 cm. Relatively large elaenia with rather prominent crest. Forehead to hindneck and upperparts are dull olive to brownish-olive, with pure white coronal patch; very thin whitish eyering, cheeks slightly mottled grey-brown; wings dusky, two whitish wingbars, yellowish to whitish edgings of remiges; tail dusky; throat sooty grey, fading to whitish or dull yellowish on belly; undertail-coverts yellowish to whitish; iris dark brown; bill black, base of lower mandible flesh-coloured; legs black. Differs from very similar *E. chiriquensis* in slightly larger size, more prominent crest, more white in crown. Sexes alike. Juvenile resembles adult. Race *remota* is smaller than nominate, with browner rump, greyer throat and chest; *chinchorrensis* is similar in size and structure, but upperparts less greenish-olive, more dark brownish (darkest on nape), no yellow tinge on belly; *cinerescens* is larger than nominate, with stronger yellow wash on belly; *riisii* is smaller and paler; *caymanensis* is similar to previous in paler coloration, but larger; *barbadensis* is also larger than nominate in all proportions, also somewhat darker below. Voice. Call a sharply whistled, sometimes slightly burry "wee-weew" or "wee-wee-weew" or "pe-weeer"; dawn song a loud clear "pee-wee-reereeree" or "peeweetprrr".

Habitat. Almost ubiquitous on most islands. Most common in canopy and borders of humid lowland evergreen forest, in deciduous woodland, scrub, tall cultivated woodland and gardens, and open land with scattered trees and shrubs, and in mangroves. Primarily in lowlands, occasionally to higher elevations on volcanic islands. Occurs in mountains in S Lesser Antilles, where range overlaps with that of *E. flavogaster*.

Food and Feeding. Both insects and fruit. Forages alone or in pairs. Often perches at edge of vegetation on semi-exposed perches, but not especially conspicuous or noisy; often sits silently in foliage for long periods of time. Sallies into air or against vegetation to hover-glean prey.

Breeding. Jan-Sept. Nest a flimsy shallow cup of twigs, up to 9 m above ground in shrub or tree. Clutch 2-3 eggs; incubation and fledging periods not documented.

Movements. Mainly sedentary; no seasonal movements. Vagrants on mainland and large fluctuations in numbers on Puerto Rico suggest that individuals probably disperse regularly to nearby islands.

Status and Conservation. Not globally threatened. Generally common and widespread; apparently less common in Netherlands Antilles, where rare on Aruba; rare on Old Providence and St Andrew's (race *cinerescens*). Fairly recently established on main island of Puerto Rico, where subsequent rapid increase in numbers was followed by decline; occurs in Guanica International Biosphere Reserve.

Bibliography. Adolph & Roughgarden (1983), Allen (1961), Anon. (1998a), Bangs (1916), Biaggi (1983), Blake, E.R. (1953), Bond (1985), Bradley (2000), Cory & Hellmayr (1927), Faaborg (1985), Griscom (1950), Howell & Webb (1995a), Howell *et al.* (1992), Iliff (1998), Johnston (1975), Keith (1997), Lanyon (1988b), Marini & Cavalcanti (1998), Meyer de Schauensee (1982), Noble (1916), Paynter (1955), Raffaele (1989), Raffaele *et al.* (1998, 2003), Ricklefs & Cox (1977), Ridgely & Tudor (1994), Ridgway (1907), Schuchmann (1981), Steadman *et al.* (1997), Stotz *et al.* (1996), Traylor (1977), Voous (1955, 1965, 1983).

22. Yellow-bellied Elaenia

Elaenia flavogaster

French: Élénie à ventre jaune **German**: Gelbbauch-Olivtyrann **Spanish**: Fiofío Ventriamarillo

Taxonomy. *P[ipra] flavogaster* Thunberg, 1822, presumably Rio de Janeiro, Brazil.

May be closely related to *E. spectabilis*; formerly treated as conspecific, but ranges overlap widely in Brazil, and they have different voices. Birds in SW Colombia appear intermediate between nominate race and *semipagana*. Four subspecies recognized.

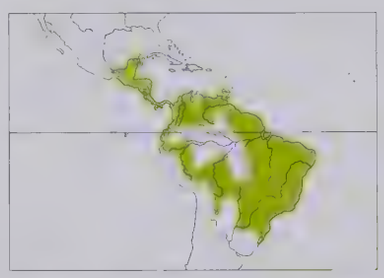
Subspecies and Distribution.

E. f. subpagana P. L. Sclater, 1860 - SE Mexico E from S Veracruz and Chiapas (including Mujeres I, off N Quintana Roo) S to Costa Rica, also SW Panama (Coiba I).

E. f. pallididorsalis Aldrich, 1937 - Panama and adjacent islands (except Coiba I).

E. f. flavogaster (Thunberg, 1822) - Colombia, Venezuela (including Margarita I and Patos I), Trinidad, Tobago, S Lesser Antilles (the Grenadines, Grenada), the Guianan Shield, Brazil (S, except in W & C Amazonas, to Rio Grande do Sul), SE Peru, Bolivia, Paraguay and NE Argentina.

E. f. semipagana P. L. Sclater, 1861 - extreme SW Colombia, W & S Ecuador (including Puná I) and interior NW Peru.



Descriptive notes. 16-17 cm; 21-29 g. Medium-sized, small-headed elaenia with conspicuous bushy crest, often parted in middle to reveal white coronal patch. Nominate race is brownish-olive above, face slightly paler than upperparts, faint whitish eyering; wings and tail slightly duskier than back, two white wingbars, yellowish-white edgings on remiges; throat pale grey, breast olive-grey, belly yellow to pale yellow or even whitish; iris dark brown; bill black, pale base of lower mandible; legs black. Distinguished from *E. chiriquensis* by larger size, more conspicuous crest; from *E. spectabilis* by slightly smaller size, much more distinct crest, presence of white crown patch, only two wingbars. Sexes alike. Immature is browner above, buff wingbars, no coronal patch. Race *subpagana* is browner and more olive above, yellower below; *pallididorsalis* is greyer overall, faintly greener on upperparts; *semipagana* is paler overall, greyer front and side of head, much-reduced white coronal patch, whiter throat, paler belly, also shorter bill. Voice. Calls include hoarse "breeer", rising and then falling, and repeated "wreek-kreeup" with hoarse or burry quality; dawn song "trr-dyeéuw, trr-trreeenh-weeeuw" or "we-do, we-do".

Habitat. Variety of humid and arid, wooded habitats, including lighter woodland, second growth and edge, scrub, savanna, as well as brushy river margins, weedy clearings with scattered trees, also trees in towns, gardens; absent from heavily forested areas. Mostly below 1500 m; recorded to 2500 m in Andes.

Food and Feeding. Insects and berries taken. Usually found singly or in pairs; larger numbers may gather at fruiting trees. Animated and conspicuous, typically perching openly and calling frequently, often seeming agitated and excited; crest frequently raised while calling. Forages with aerial sallies, perch-gleans, and hover-gleans.

Breeding. Feb-Sept; May-Sept in Colombia (although birds in breeding condition in Feb), mainly Apr-Jun in Lesser Antilles; mainly Apr-Jun in Trinidad and Tobago, but recorded also in Nov-Dec; nest-building observed in Mar in Venezuela; sometimes two broods. Nest a neat grass or moss cup, lined with feathers and decorated with lichens and bark, placed in fork of small branch. Clutch 2 eggs, rarely 1 or 3; incubation by female, period 16 days; chicks brooded by female, fed by both parents, fledging period 15-17 days.

Movements. Mainly resident; in Mexico, those in Veracruz and Oaxaca largely withdraw to S of Isthmus of Tehuantepec in winter months.

Status and Conservation. Not globally threatened. Fairly common to common throughout most of range; rather uncommon locally, e.g. in parts of Ecuador. Range possibly extends farther S; sight record from N Chile (near Arica). Occurs in numerous national parks and other protected areas. Preference for more open woodland and widespread tolerance of converted habitats, combined with large range, suggest that this species is reasonably secure. Probably of some importance as a seed-disperser; has been shown to disperse seeds widely in second-growth areas.

Bibliography. Anon. (1998a), Barrantes & Pereira (2002), Belton (1985), Binford (1989), Brooks *et al.* (1993), Canevari *et al.* (1991), Cory & Hellmayr (1927), Di Giacomo (2004), Faaborg (1985), ffrench (1991), Guix (1995), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995a), Krügel *et al.* (2000), Lanyon (1988b), Lowen *et al.* (1996), Marcondes (2002), Marini & Cavalcanti (1998), Miller (1963), Moermond (1985), Monroe (1968), Narosky & Salvador (1998), Olson (1997), Payne (1984), de la Peña (1988), Raffaele *et al.* (1998), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), do Rosário (1996), Salaman (1994), Short (1975),

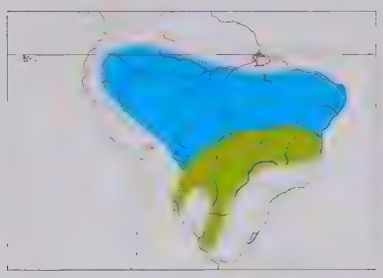
Sick (1993, 1997), Skutch (1960), Slud (1964), Stiles & Skutch (1989), Stotz *et al.* (1996), Thurber *et al.* (1987), Tostain *et al.* (1992), Traylor (1977), Tubelis (2000), Wetmore (1972), Williams & Tobias (1994), Wright *et al.* (1985), Zimmer (1941a).

23. Large Elaenia

Elaenia spectabilis

French: Élénie remarquable **German**: Graubrust-Olivtyrann **Spanish**: Fiofío Grande

Taxonomy. *Elainea* [sic] *spectabilis* Pelzeln, 1868, Goiás, Brazil.
May be closely related to *E. flavogaster*; formerly treated as conspecific, but ranges overlap widely in Brazil, and they have different voices. Sometimes considered conspecific with *E. ridleyana*, but significant differences in vocalizations. Monotypic.
Distribution. Breeds E of Andes in C, S & E Brazil, E Bolivia, N Argentina and N Uruguay; occurs also, probably only as non-breeding visitor, in Amazon Basin of SE Colombia, E Peru, N Bolivia and W Brazil.



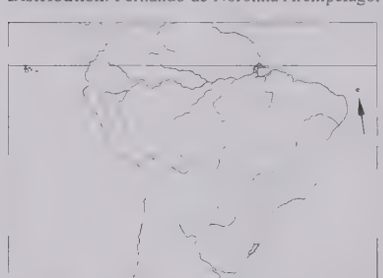
Descriptive notes. 18 cm; 28-30 g. Large elaenia with slight crested appearance. Has head mostly olive-brown, little or no white coronal patch; upperparts uniform dark greyish-olive, wings and tail dusky, two well-marked white wingbars on greater and median wing-coverts, usually also whitish bar on lesser coverts; throat greyish, grading to dark olive-grey on breast, contrasting sharply with yellow belly and undertail-coverts; iris dark brown to grey-brown; bill black, pale flesh-coloured base of lower mandible; legs black. Distinguished from very similar *E. flavogaster* by slightly larger size, less crested appearance, little or no white showing at base of crest, usually a third wingbar (on lesser coverts), and throat more pure grey. Sexes alike. Juvenile resembles adult. Voice. Call a soft "cleeur" or "wheeo", also "wheer" or "cheer", delivered 3-10 seconds apart; dawn song a shrill, repetitious "twee-wee-tweet".
Habitat. Mainly edges of forested habitats in lowlands. Forest borders, shrubby clearings, early-successional riparian zones, second growth, and thickets; mainly in riparian growth and fruiting trees in N during austral winter. Sometimes observed in trees around buildings. Generally in heavier forest than that preferred by *E. flavogaster*.
Food and Feeding. Insects and fruit. Usually forages solitarily, high in canopy. Perches with upright posture; much less excitable and less conspicuous than *E. flavogaster*. Usually perches on exposed twigs at edge of foliage or in treetops, and perch-gleans and hover-gleans.
Breeding. Oct-Mar. Nest a small, neat cup 8 cm in diameter, 4 cm in height, lined with plant fibres and feathers, exterior coated with lichens and mosses, placed 4-6 m above ground in fork of small branch. Clutch 2 eggs; incubation 14-15 days; young fledge in 17-19 days.
Movements. Post-breeding migration N into Amazon Basin; recorded in Colombia from early Jun to late Aug.
Status and Conservation. Not globally threatened. Locally fairly common. Occurs in several protected areas, including e.g. Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, Madidi and Noel Kempff Mercado National Parks and Beni Biosphere Reserve, in Bolivia, San Rafael National Park, in Paraguay, Cerro Corá National Park, in Uruguay, and San Juan de Poriahú Private Reserve (in Iberá Provincial Reserve), in Argentina.
Bibliography. Babarskas *et al.* (2003), Bates & Parker (1998), Canevari *et al.* (1991), Chesser (1997), Claramunt & González (1999), Cory & Hellmayr (1927), Di Giacomo (2004), Dubs (1992), Hilty & Brown (1986), Joseph (1996), Klimaitis & Moschione (1987), Krügel *et al.* (2000), Lanyon (1988b), Marini & Cavalcanti (1998), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nicéforo & Olivares (1976), Pearson (1980), de la Peña (1987, 1988, 1995, 1999), Ridgely & Tudor (1994), Robinson (1997), Schulenberg *et al.* (2001), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Wetmore (1972), Zimmer (1941a).

24. Noronha Elaenia

Elaenia ridleyana

French: Élénie de Noronha **German**: Noronha-Olivtyrann **Spanish**: Fiofío de Noronha

Taxonomy. *Elainea* [sic] *ridleyana* Sharpe, 1888, Fernando de Noronha, off Pernambuco, Brazil.
Has been treated as a race of *E. spectabilis* or of *E. chiriquensis*, but differs significantly from both in vocalizations. Monotypic.
Distribution. Fernando de Noronha Archipelago, off coast of NE Brazil (Pernambuco).



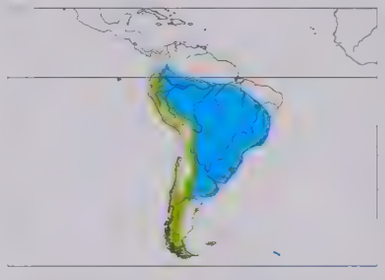
Descriptive notes. 17 cm. Large elaenia with slight crested appearance. Head is mostly olive-brown, little or no white coronal patch; upperparts uniform dark greyish-olive, wings and tail dusky, three white wingbars; throat greyish, grading to dark olive-grey on breast, contrasting sharply with yellow belly and undertail-coverts; iris dark brown; bill black, pale flesh-coloured base of lower mandible; legs black. Distinguished from very similar *E. spectabilis* and *E. chiriquensis* by relatively longer bill and shorter tail, from latter also by much larger size. Sexes alike. Juvenile undescribed. Voice. Calls vary, but gives repeated "thiu-thiu-thiu" and "uuu uuu uuu".
Habitat. Dry woodland, open forest, scrub, and thickets around houses.
Food and Feeding. Insects; also small fruits, especially of *Ficus noronhae*. Little known. Perches upright; behaviour apparently similar to that of congeners.
Breeding. Jun-Aug. Nest a neat cup 8 cm across, made of tendrils of Cucurbitaceae and a few fine twigs, lined thickly with woolly down of seeds of *Gonolobus micranthus*, often placed in bare branches of *Burra* or *Erythrina* tree or cashewnut (*Anacardium*) tree. Clutch uncertain, probably 1-2 eggs (1 egg in described nest); incubation and fledging periods not documented.
Movements. Resident.
Status and Conservation. VULNERABLE. Restricted-range species: present in Fernando de Noronha EBA. Uncommon. Present on the main island and on Rata (the largest associated islet), giving global range of only 18 km². Total population c. 100-1000 invididuals, and estimated 480 in the most comprehensive survey; the least common of the archipelago's three resident landbird species. When first discovered by Europeans, in 1503, the archipelago was covered in forest; since then, all large trees have been cut, and all remaining vegetation is secondary. Proposals for tourist development, if carried out, would cause yet greater damage. The species may also suffer from introduced mammals such as rats (*Rattus*) and cats, as well as from activities of children, who target birds with slingshots. Nevertheless, its future should be secure so long as sufficient forest cover survives. Although Fernando de Noronha is a Marine National Park, the effective protection conferred by this designation is not known.
Bibliography. Antas *et al.* (1990), Cory & Hellmayr (1927), Forrester (1993), Marini & Cavalcanti (1998), Olson (1981), Oren (1982), Ridgely & Tudor (1994), Sick (1985, 1993, 1997), Soto *et al.* (2000), Stattersfield & Capper (2000), Stotz *et al.* (1996).

25. White-crested Elaenia

Elaenia albiceps

French: Élénie à cimier blanc **German**: Weißbauch-Olivtyrann **Spanish**: Fiofío Crestiblanco
Other common names: Peruvian Elaenia (*modesta*); Chilean Elaenia (*chilensis*)

Taxonomy. *M[uscipeta] albiceps* d'Orbigny and Lafresnaye, 1837, Yungas, Bolivia.
Closely related to *E. parvirostris*, and vocally very similar; has been suggested that the two are conspecific, but they apparently do not hybridize across broad area of range overlap in Argentina. Race *chilensis* has been treated as a separate species, although no significant vocal differences from others; this race hybridizes locally with *E. parvirostris* where ranges overlap in S Bolivia (but not in NW Argentina). In addition, race *modesta* sometimes treated as a separate species. Race *griseigularis* possibly hybridizes with *E. pallatangae* in Ecuador. Six subspecies currently recognized.
Subspecies and Distribution.
E. a. griseigularis P. L. Sclater, 1859 - SW Colombia S to NW Peru (S to W Cajamarca).
E. a. diversa J. T. Zimmer, 1941 - Andes of NC Peru (Cajamarca S to Huánuco).
E. a. urubambae J. T. Zimmer, 1941 - SE Peru (near Cuzco).
E. a. albiceps (d'Orbigny & Lafresnaye, 1837) - SE Peru (S from Puno) S to NW Bolivia.
E. a. modesta Tschudi, 1844 - W Peru S to NW Chile.
E. a. chilensis Hellmayr, 1927 - breeds in Andes from S Bolivia (Chuquisaca) S to Argentina (S to Catamarca and W Córdoba), thence S in lowlands to Tierra del Fuego; migrates N as far as Peru (possibly Colombia) and NE Brazil (Pará and Bahia).



Descriptive notes. 14·5-15 cm; 15-16 g. Small elaenia, only slightly crested, but white coronal stripe often visible. Nominate race has top of head and upperparts uniform dingy olive-grey, white to creamy coronal patch; face slightly paler than upperparts, distinct but narrow eyering and pale lores; wings and tail duskier, two yellowish-white wingbars, whitish edgings on remiges; throat greyish, breast greyish-brown, belly pale whitish; iris dark brown; bill black, pale greyish base of lower mandible; legs black. Distinguishable from extremely similar *E. parvirostris* by lack of wingbar on lesser coverts, but in the field often proves inseparable from that species, *E. pallatangae* and *E. mesoleuca*. Sexes alike. Juvenile has wingbars yellower, less distinct, than adult, coronal patch poorly developed or absent. Race *griseigularis* has on average paler upperparts, shorter crest, less white in crown, less distinct eyering than nominate, many individuals inseparable; *diversa* is similar to previous, but whiter throat, wingbars less distinct, more extensive coronal patch, olive flanks contrasting with white belly; *urubambae* differs from nominate in paler upperparts, more uniform side of head (without prominent eyering or pale lores), wingbars duller, belly with pale yellow wash, bill slightly heavier; *modesta* is paler and duller overall, wingbars less conspicuous, face dull and almost lacking eyering and contrasting pale lores, has dark centers of otherwise grey crown feathers giving speckled appearance; *chilensis* is dark olive above with bold whitish eyering and lores, pure white coronal patch, yellowish-white wingbars narrow and sharply defined, throat and breast pale olive-grey, becoming white on belly, flanks olive, undertail-coverts yellow. Voice. Call during breeding a burry "feeur" or "feeo", sometimes repeated over and over for long periods, also faster "peeur-peer"; mostly silent at other times, and birds in N Andes less vocal.
Habitat. Scrub, woodland borders, gardens and shrubby areas. Prefers more arid non-forested areas in N part of range, but sometimes at edge of humid, stunted cloudforest. Race *chilensis* breeds in southern beech (*Nothofagus*) forest, deciduous woodland, shrubby hillsides, and clearings with scattered trees or shrubs. During austral winter found in low shrubbery, open woodland, clearings and elfin forest. Sea-level to 3300 m.
Food and Feeding. Insects and berries; also recorded feeding on nectar of introduced *Grevillea robusta*. Sometimes solitary, but will congregate at flowering and fruiting trees. Generally less conspicuous than *E. flavogaster*, often perching upright in dense foliage for periods of time; at other times active and vocal, and sometimes accompanies mixed-species flocks. Perch-gleans and hover-gleans for berries, and also for nectar.
Breeding. Nov-Jan. Nest a well-built cup 8·5 cm in diameter, 5 cm deep, made of vegetable fibres and small twigs, decorated with lichens, lined with plant stems, feathers or thistle down, placed in forked branch of tree or bush; one record of nest in cavity, the only such record for the genus. Clutch 2-3 eggs; incubation and fledging periods not known.
Movements. In N of range largely resident, but probably descending to lower elevations during non-breeding season; race *modesta* moves to interior Peru. S race *chilensis* highly migratory, probably almost entirely so (e.g. no Jun-Jul specimens from Bolivia), spending austral winter throughout C South America, including Amazon Basin; occasional individuals may overwinter in C Chile. Two major migration routes documented: one N-S along E slope of Andes; other from Argentina towards Atlantic coast and N to Brazilian Amazonia, possibly returning S through C Brazil. At least some breeding-season records in Bolivia possibly involve late-returning migrants, rather than breeders. Vagrants recorded in Falkland Is; also, a sight record of an individual flying S half-way between South American mainland and South Shetland Is (off Antarctica).
Status and Conservation. Not globally threatened. Fairly common to locally abundant; appears to be less numerous in N. Occurs in many national parks and other protected areas throughout its range; for example, present in every protected area in forested S part of Argentina and Chile. Given this species' occupancy of secondary habitats and widespread tolerance of converted habitats, it is unlikely to be at any real risk. Furthermore, it is considered an important pollinator for flowering trees (e.g. the proteaceous *Embothrium coccineum*) in *Nothofagus* forest in Chile.

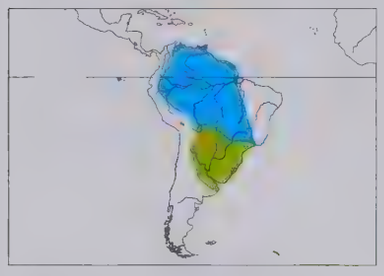
Bibliography. Anderson & Rozzi (2000), Brooks *et al.* (1993), Canevari *et al.* (1991), Celis-Díez (2002), Chebez & Bertonatti (1994), Chesser (1997), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2000, 2003), Cracraft (1985), Davies *et al.* (1994), Dubs (1992), Escobar & Vukasovic (2002), Espinosa & Egli (1997), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Forrester *et al.* (1977), Hayes (1995), Hilty & Brown (1986), Hiriart *et al.* (2000), Hoy (1971), Humphrey *et al.* (1970), Jaramillo (2003), Jiménez (2000), Johnson (1967), Joseph (1996), Koepcke (1970), Lanyon (1988b), Marini & Cavalcanti (1990, 1998), Narosky & Salvador (1998), Ojeda & Trejo (2002), de la Peña (1987, 1988, 1999), Quiroga *et al.* (1998), Remsen (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rozzi *et al.* (1996), Salaman (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977, 1982), Venegas & Schlatter (1999), Vuilleumier (1985), Walker (2001), Wetmore (1926), Williams & Tobias (1994), Williamson (1975), Zimmer (1930, 1941a).

26. **Small-billed Elaenia**

Elaenia parvirostris

French: Élénie à bec court **German**: Dreibinden-Olivtyrann **Spanish**: Fiofío Piquicorto

Taxonomy. *Elainea* [sic] *parvirostris* Pelzeln, 1868, Curitiba, Paraná, Brazil.
Described taxon *E. aenigma* is a synonym of present species. Closely related to *E. albiceps*, and vocalizations are very similar; these two forms have been suggested as perhaps being conspecific, but apparently do not hybridize across a broad area of range overlap in Argentina, although hybridization does occur in a narrow area of overlap in S Bolivia. Reported hybridization between present species and *E. mesoleuca* in SE Brazil (Rio Grande do Sul) is disputed by some authors. Monotypic.
Distribution. Breeds E & SE Bolivia, Paraguay, S Brazil (São Paulo S to Rio Grande do Sul), NE Argentina (S to Buenos Aires) and Uruguay. Migrates N to Amazon Basin and as far as NE Colombia, N Venezuela, Netherlands Antilles, Trinidad and the Guianas.



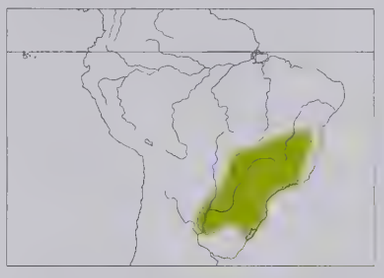
Descriptive notes. c. 14·5 cm. Small elaenia with white coronal patch and three distinct wingbars. Has narrow whitish eyering, small white coronal patch; rest of top half of head, and entire upperparts, bright olive-green, wings and tail dusky, three whitish wingbars, whitish edging on remiges; throat pure plain grey, breast slightly darker (sometimes with faint olive wash), belly whitish; iris dark brown; bill black, lower mandible flesh-coloured at base, gape bright orange; legs black. Distinguished from very similar *E. mesoleuca* by having white coronal patch, wingbar also on lesser coverts, no strong olive wash on breast; from *E. albiceps* (of race *chilensis*) by extra wingbar, less distinct eyering, slightly shorter bill, but some inseparable. Sexes alike. Juvenile differs from adult in less distinct, yellower wingbars, coronal patch poorly developed or absent. Voice. Song "cher-br", similar to that of *E. albiceps*, also a "chee-oh", and "chit-chit-chea-oh-weet"; dawn song "weedable-we". Calls include many sharp notes; often a soft "cheeu" by migrants in non-breeding season.
Habitat. Variety of woodland and forest habitats, especially edges and openings. Found in towns, gardens, riverine forest, open and deciduous woodland, humid forest edge, open areas with scattered trees. Mostly in lowlands, but occasional breeding records to 2000 m (Bolivia). In austral winter mainly in light woodland, shrubbery and gardens, but also canopy of humid forest and river islands, to 1000 m (slightly higher in Andes).
Food and Feeding. Insects; regularly also small fruits or berries. Perches upright, often in lower levels of shrubs and edge, but also in canopy. Usually solitary, quiet and inconspicuous on wintering grounds, but sometimes several loosely associated in group; also found in mixed-species flocks feeding at termite (Isoptera) swarms. Perch-gleans and hover-gleans insects from foliage, regularly makes short aerial sallies for flying prey.
Breeding. Sept-Mar. Nest a neat cup 6·5 cm in diameter, 5 cm deep, constructed of small twigs and vegetable fibres, entire exterior decorated with mosses, spiderweb and lichens. Clutch 2-3 eggs; incubation 14 days; young fledge in 15 days.
Movements. Highly migratory. Moves N after breeding; spends austral winter (Apr-Oct) across all of Amazonia, mainly in N South America, and as far N as the S Caribbean (Netherlands Antilles, Trinidad).
Status and Conservation. Not globally threatened. Common; widespread in non-breeding season. Occurs in most national parks and other protected areas within its range. Preference for edges and more open woodland, and widespread tolerance of disturbed and converted habitats, make this species unlikely to become threatened in near future.
Bibliography. Babarskas *et al.* (2003), Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Cueto & López (2002), Di Giacomo (2004), Dubs (1992), ffrench (1991), Fjeldså & Krabbe (1990), Friedmann & Smith (1950), Gunski *et al.* (2000), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hilty (2003), Hilty & Brown (1986), Hoy (1971), Klimaitis & Moschione (1987), Lanyon (1988b), Lowen *et al.* (1996), Marini & Cavalcanti (1998), Miserendino (1998), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Pearson (1980), de la Peña (1987, 1988, 1995, 1999), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), do Rosário (1996), Schmitt *et al.* (1997), Short (1975), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977, 1982), Wetmore (1926), Zimmer (1941a).

27. **Olivaceous Elaenia**

Elaenia mesoleuca

French: Élénie olivâtre **German**: Schlichttyrann **Spanish**: Fiofío Oliváceo

Taxonomy. [*Muscicapa*] *mesoleuca* Deppe, 1830, Montevideo, Uruguay.
Reported to hybridize with *E. parvirostris* in SE Brazil (Rio Grande do Sul), but this disputed by subsequent authors. Monotypic.
Distribution. SE Brazil (S Goiás and S Bahia S to Rio Grande do Sul), E Paraguay, NE Argentina and N Uruguay.



Descriptive notes. 14-16 cm; 16-20 g. Small elaenia with dark breast, two wingbars. Plumage is dull olive above, whitish eyering, little or no white in crown; wings and tail dusky, wing-coverts tipped yellowish or white, forming two wingbars, remiges narrowly edged whitish; throat dull grey, breast distinctly olive (slight "vested" effect), belly white, flanks and undertail-coverts washed with pale yellow; iris brown; bill black, lower mandible flesh-coloured at base; legs black. Distinguished from very similar *E. parvirostris* most reliably by olive on breast, also by absence of third wingbar (on lesser coverts) and lack of white coronal patch, but many individuals not safely separable. Sexes alike. Juvenile has wingbars less distinct. Voice. Primary call harsh, unmelodious, of 4 notes with pause between first and second, "whik whikiur" or "prrrr, prr-prréé-rrr", has been transliterated as "Frank McQueeter"; also "chirr", and variety of quick single notes such as "pic", "oink" and "wow".
Habitat. Interior of humid tropical and upper tropical forest, including forest borders, gallery forest, woodland, and adjacent clearings, from sea-level to at least 2000 m. Mainly in forest interior; where range overlaps with that of *E. parvirostris*, latter is found mainly in woodland borders.
Food and Feeding. Diet insects and wide variety of small fruits and berries. Generally inconspicuous; perches upright on exposed branches or hidden in foliage in forest canopy or undergrowth. Forages from lower levels to high in canopy, vine tangles, and clearings. Perch-gleans and sallies for insects.
Breeding. Nests found in Dec and Jan; season probably Sept-Apr. Nest a simple cup of loosely packed moss mixed with *Tillandsia* and hyphae of *Marasmius* fungus, exterior decorated with lichens, 4-9 m up in fork of small branch in tree; nest much more coarse and loose than that of *E. parvirostris*, and exterior less extensively decorated. Clutch 2-3 eggs; incubation 15-16 days; chicks fed with both berries and insects, fledge in c. 20 days.
Movements. Probably withdraws into N part of range in austral winter; present in extreme SE Brazil (Rio Grande do Sul) only in Sept-Apr.
Status and Conservation. Not globally threatened. Locally fairly common to common. Common at higher elevations in Itatiaia National Park, in Brazil. Occurs also in several other protected areas, e.g. Caaguazú, San Rafael and Ybycuí National Parks, all in Paraguay, and in Aparados da Serra, Iguaçu and Serra da Canastra National Parks and Mata dos Godoy State Park (Paraná), all in Brazil.
Bibliography. Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Claramunt & Rocha (2001), Cory & Hellmayr (1927), Cracraft (1985), Di Giacomo (2004), Ferreira de Vasconcelos (2001), Hayes (1995), Lanyon (1988b), López (1997), Lowen *et al.* (1996), Marini & Cavalcanti (1998), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988, 1997), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977).

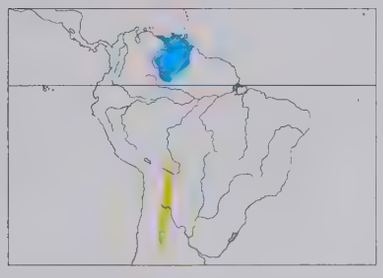

inches
4
cm
10
28
29
30
31
ssp
chiriquensis
32
ssp
brachyptera
ssp fallax
34
35
36
33
ssp
cherriei
37
ssp
pallatangae
38
39
ssp
olivina
40
41
42
ssp
obsoletum
ssp
caucae
ssp suiriri
ssp affinis
44
ssp olivaceum
43
ssp bahiae
ssp flaviventre
ssp
orphnum
45

28. **Slaty Elaenia**

Elaenia strepera

French: Élénie bruyante **German**: Schiefertyrann **Spanish**: Fiofío Plomizo

Taxonomy. *Elainea* [sic] *strepera* Cabanis, 1883, foothills of Tucumán, Argentina.
No obvious close relatives within genus. Monotypic.
Distribution. Breeds on E slope of Andes in S Bolivia (S from W Santa Cruz) and NW Argentina; winters in lowlands N to N Venezuela.



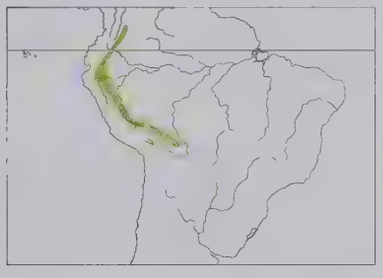
Descriptive notes. 15·5 cm; 18-20 g. Small elaenia with grey plumage, rounded head only slightly crested, tail comparatively long. Male has slate-grey head, slightly paler on cheek, white coronal patch (semi-concealed), narrow white eyering; upperparts slate-grey, wings darker dusky grey, slightly paler edgings on wing-coverts (only indistinct wingbars) and remiges; tail dusky; paler below, throat whitish to pale grey, breast and flanks grey, belly and undertail-coverts whitish; iris dark brown; bill flat and wide, black, basal half of lower mandible flesh-coloured; legs black. Female resembles male, but with olive wash above, more prominent wingbars tinged ochraceous, throat and breast olive-grey, contrasting with yellowish-white belly. Immature is similar to female, but with 3-4 ochraceous wingbars, paler below. Voice. Distinctive call a dry, gravelly "eh-eh-ehhhhhh", unlike that of congeners, more like a frog or locust (Orthoptera) than a bird; silent on passage and in non-breeding quarters.
Habitat. Woodland and forest borders, often along streams at middle elevations, 500-2000 m in breeding season; during migration and austral winter, shrubby openings, forest borders and forest canopy, from sea-level to c. 400 m.
Food and Feeding. Insects, also berries. Generally inconspicuous, often remains in dense foliage, although sometimes sits erect and quietly on open branches for longish periods; often jerks tail. Usually solitary or in pairs; during migration often joins mixed-species flocks in canopy of primary forest. Perch-gleans and hover-gleans; also takes aerial insects by sallying from open perches, then reminiscent of a swallow (Hirundinidae).
Breeding. Oct-Feb. Nest a cup 15 cm in diameter, 3·5 cm in height, of small twigs and leaves, built c. 5 m above ground in crotch of branch. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Long-distance migrant; spends non-breeding season in N South America, recorded Mar-Sept in N Venezuela. Migrants infrequently recorded, mainly in lowlands of E Colombia (Oct) and E Peru (Sept-Nov); probably occurs as transient in E Ecuador and W Brazil, although not yet recorded in those regions.
Status and Conservation. Not globally threatened. Restricted-range species: present in Argentine and South Bolivian Yungas EBA. Locally common. Common in El Rey National Park, in Argentina. During austral winter, observed in all national parks N to Apurímac, in Peru, and in upper Amazon area. Although the Yungas in La Paz and Cochabamba (Bolivia) are still 90% intact, c. 60% of forests of the Boliviano-Tucumano semi-evergreen zone of S Bolivia and Argentina have been cleared or heavily disturbed, mainly for pasture; large areas in Bolivia also degraded or lost owing to logging, agricultural conversion, colonization and road-building.
Bibliography. Allen (1995), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Hennessey, Herzog & Sagot (2003), Hilty (2003), Hilty & Brown (1986), Joseph (1996), Lanyon (1988b), Marantz & Remsen (1991), Marini & Cavalcanti (1998), McNeil (1982), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (2000), Pearson (1980), de la Peña (1988, 1999), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977), Zimmer (1941a).

29. **Mottle-backed Elaenia**

Elaenia gigas

French: Élénie écaillée **German**: Schuppenolivtyrann **Spanish**: Fiofío Gigante
Other common names: Giant Elaenia

Taxonomy. *Elainea* [sic] *gigas* P. L. Sclater, 1871, Río Napo, Ecuador.
Possibly most closely related to *E. flavogaster* on basis of voice, behaviour and large crest. Monotypic.
Distribution. E base of Andes from S Colombia (S from W Meta) S to W Bolivia (La Paz, Cochabamba).



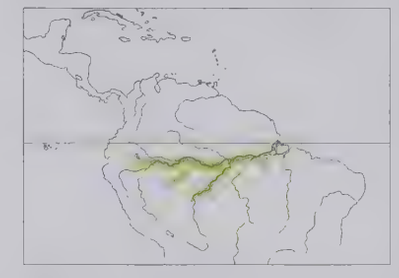
Descriptive notes. 18 cm. Large elaenia with prominent bifurcated crest and large white coronal patch, often looks "horned". Plumage is otherwise olive-brown above, faint whitish eyering; paler green-olive edgings on back (can present mottled or streaked effect); wings dusky, two whitish wingbars, whitish edgings of remiges, tail dusky; throat grey, becoming somewhat streaked or clouded with olive on breast and flanks, belly and undertail-coverts pale yellow; iris dark brown; bill black, flesh-coloured base of lower mandible; legs black. Sexes alike, female slightly smaller. Juvenile undescribed. Voice. Frequent calls a martin-like "direet" and a shrill "pert-chéér"; dawn song "wurdit" or "purdip", given repeatedly from top of low tree or bush.
Habitat. Successional forest habitats in tropical to upper tropical zones, including riparian growth and landslides, man-made clearings in formerly forested areas, willow (*Salix*) and *Tessaria* scrub on river islands, and edges; mainly 250-1250 m, occasionally as high as 1800 m.
Food and Feeding. Insects and small fruits. Perches upright, often on exposed branches, distinctive crest almost always raised; usually appears conspicuous, active and excited, as *E. flavogaster*. Forages at levels of 3-20 m; makes short sallies into air, also hover-gleans.
Breeding. Birds with enlarged gonads in Oct-Nov. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare to locally fairly common. Occurs in Tinigua National Park, in Colombia, Podocarpus National Park and Kapawi and Yuturi Lodges, all in Ecuador, and Manu National Park and Biosphere Reserve, in Peru. Possibly extending its range as a result of deforestation.
Bibliography. Chapman (1917c, 1921), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Hennessey, Herzog & Sagot (2003), Hilty & Brown (1986), Lanyon (1988b), Marini & Cavalcanti (1998), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Stotz *et al.* (1996), Traylor (1977), Zimmer (1930, 1941a).

30. **Brownish Elaenia**

Elaenia pelzelni

French: Élénie brune **German**: Brauntyrann **Spanish**: Fiofío Pardo

Taxonomy. *Elaenia pelzelni* Berlepsch, 1907, Lamalonga, Rio Negro, Brazil.
Affinities unknown. Monotypic.
Distribution. R Amazon and larger S tributaries in NE Peru, Brazil and extreme N Bolivia (Pando); sight record in extreme SE Colombia (near Leticia).



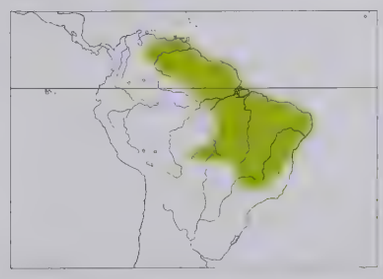
Descriptive notes. 18 cm. Distinctive large, dull brownish elaenia. Male has dull brownish head, ear-coverts and face paler brownish, white coronal patch (semi-concealed), inconspicuous whitish eyering and lores; upperparts uniform dull brownish; wings dusky brown, darker than back, all wing-coverts tipped pale (three brownish-white wingbars), remiges edged whitish; tail long, dusky brown; throat white, underparts whitish, breast and flanks washed dingy brownish, undertail-coverts sometimes slightly brownish; iris dark brown; upper mandible black, lower mandible pale flesh-coloured with black tip; legs black. Female lacks coronal patch. Immature has more whitish on wing feathers, rufous wingbars, fulvous underwing and uppertail-coverts, pale-tipped tail. Voice. Calls include variety of burry and clear notes, e.g. low "chick-ert" or "chick-ert-ert" with first note slightly higher, a clearer "chick-urp" or "per-cheet" with second note higher; also, repeated liquid "whit" and high metallic "chick-eep".
Habitat. Riverine forest, especially on river islands, where most often reported in mature stands of tall *Cecropia* on older river islands; also shrubby second growth. To 200 m.
Food and Feeding. No information on diet, but presumably insects and fruits; specialized habitat suggests possible extensive reliance on *Cecropia* fruits. Perches upright, from low levels to high in canopy; rather wary.
Breeding. No information.
Movements. Little information; perhaps local or erratic movements in response to seasonal changes in river levels.
Status and Conservation. Not globally threatened. Locally fairly common. Fairly common in *Cecropia* trees around Iquitos, in Peru. Poorly known species.
Bibliography. Cory & Hellmayr (1927), Forrester (1993), Hennessey, Herzog & Sagot (2003), Lanyon (1988b), Marini & Cavalcanti (1998), Meyer de Schauensee (1982), Pearson (1975), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Zimmer (1941a).

31. **Plain-crested Elaenia**

Elaenia cristata

French: Élénie huppée **German**: Braunscheitel-Olivtyrann **Spanish**: Fiofío Crestado

Taxonomy. *Elainea* [sic] *cristata* Pelzeln, 1868, Goiás, Brazil.
Has been hypothesized as being closest to *E. ruficeps* on basis of nostril structure and wing formula, but the two differ greatly in plumage and behaviour. Two subspecies recognized.
Subspecies and Distribution.
E. c. cristata Pelzeln 1868 - Venezuela E of Andes, the Guianas, N, C & E Brazil (S to São Paulo; absent from W & C Amazon Basin) and extreme E Bolivia; isolated populations in SE Colombia (Caquetá, Vaupés), SE Peru (locally in Cuzco and Madre de Dios) and extreme W Bolivia (La Paz).
E. c. alticola J. T. Zimmer & Phelps, Sr, 1946 - tepuis in SE Venezuela (SE Bolívar) and adjacent N Brazil.



Descriptive notes. 14·5 cm; 18 g. Small, very dull elaenia lacking white coronal patch; greatly elongated crown feathers forming conspicuous crest, usually held partially erect and tending to project rearwards. Has head and upperparts uniform dull olive-brown, narrow whitish eyering; wings dusky, two broad whitish wingbars, whitish edgings of remiges, tail dusky; throat greyish-white, becoming greyish-olive on breast, fading to pale yellow on belly and undertail-coverts; iris dark brown; bill black, lower mandible with pale base and brownish tip; legs black. Differs from extremely similar *E. parvirostris* and *E. albiceps* in lack of white in crown, more noticeable crest. Sexes alike. Juvenile undescribed. Race *alticola* is

On following pages: 32. Lesser Elaenia (*Elaenia chiriquensis*); 33. Rufous-crowned Elaenia (*Elaenia ruficeps*); 34. Mountain Elaenia (*Elaenia frantzii*); 35. Greater Antillean Elaenia (*Elaenia fallax*); 36. Highland Elaenia (*Elaenia obscura*); 37. Great Elaenia (*Elaenia dayi*); 38. Sierran Elaenia (*Elaenia pallatangae*); 39. Yellow-bellied Tyrannulet (*Ornithion semiflavum*); 40. Brown-capped Tyrannulet (*Ornithion brunneicapillus*); 41. White-lored Tyrannulet (*Ornithion inerme*); 42. Northern Beardless Tyrannulet (*Camptostoma imberbe*); 43. Southern Beardless Tyrannulet (*Camptostoma obsoletum*); 44. Suiriri Flycatcher (*Suiriri suiriri*); 45. Chapada Flycatcher (*Suiriri islerorum*).

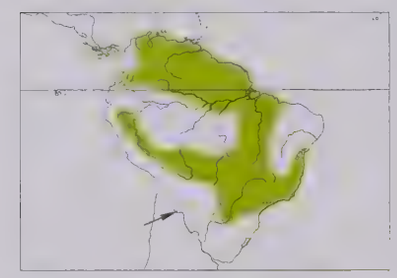
very like nominate. Voice. Infrequent fast, gravelly "jer-jéhjeh", sometimes repeated; dawn song a whistled "chev`a`rear", final note buzzy. Calls include soft melodious "wee", short rattle as "wee`he`he`he`he", low "wheesp" or wheeb", and rising and then falling "dsooty-ééo".
Habitat. Closely tied to open habitats, especially natural savanna vegetation; open park-like savanna woodland (especially with *Curatella* and *Brysonima* trees), scrubby thickets and *cerrado*, locally to1500 m. In SE Peru recorded in arid, rainshadow valley of Andes and along early-successional river margins dominated by *Tessaria*.
Food and Feeding. Insects and berries. Often conspicuously perched, with upright posture, in tops of shrubs or trees, alone or as loosely associated pair. Forages mostly by perch-gleaning or fluttery hover-gleans. Of 54 observed food captures in *Tessaria*-dominated brushy river edges in Peru, 19% involved aerial sallies, 24% upward hover-gleans, 9% downward hover-gleans, 7% upward strikes, 20% perch-gleans; small fruits taken in 20% of cases.
Breeding. No information available on seasonality. Nest a cup of finely woven mosses covered with lichens, lined with plant wool. Clutch 2 eggs; incubation and fledging periods not known.
Movements. Resident in Venezuela. Possibly partially migratory in S Brazil, as numbers fluctuate in Mato Grosso, becoming very common in Aug-Sept; records from Peru may involve migrants.
Status and Conservation. Not globally threatened. Fairly common to locally common; few records from Peru. Likely occurrence in E Colombia requires confirmation. Areas of dry forest are threatened by fires, cattle browsing, selective logging and slash-and-burn cultivation. Nevertheless, the species has a large range and occurs in many national parks and other protected areas, e.g. Alto Orinoco-Casiquiare Biosphere Reserve, in Venezuela, Noel Kempff Mercado National Park, in Bolivia, and EMBRAPA Experimental Station and Serra da Canastra National Park, both in Brazil; recorded in Manu National Park and Biosphere Reserve, in Peru.
Bibliography. Bates & Parker (1998), Cavalcanti (1988), Chapman (1921), Cory & Hellmayr (1927), Dubs (1992), Fitzpatrick (1980c), Gilliard (1941), Haffer (1974), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Lanyon (1988b), Marini & Cavalcanti (1998), Meyer de Schauensee (1982), Novaes (1978a), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977), Tubelis (2000), Urben-Filho *et al.* (2000), Wetmore (1939), Willis & Oniki (1988c), Zimmer (1941a).

32. Lesser Elaenia

Elaenia chiriquensis

French: Élénie menue **German**: Grauwangen-Olivtyrann **Spanish**: Fiofío Belicoso
Other common names: Chiriqui Flycatcher

Taxonomy. *Elainea* [sic] *chiriquensis* Lawrence, 1865, near David, Chiriquí, Panama.
Probably the mainland ancestor of *E. martinica*. In the past was sometimes treated as conspecific with *E. ridleyana*, but voices very different. Three subspecies recognized.
Subspecies and Distribution.
E. c. chiriquensis Lawrence, 1865 - tropical zone of SW Costa Rica and Pacific slope of W Panama (E to Canal Zone, including Coiba I and Pearl Is).
E. c. brachyptera Berlepsch, 1907 - SW Colombia (Pacific slope in Nariño) and NW Ecuador (Imbabura, Pichincha).
E. c. albivertex Pelzeln, 1868 - Netherlands Antilles (Aruba, Curaçao, Bonaire), Trinidad, N, C & E Colombia, Venezuela, the Guianas, scattered localities throughout N, E & C Brazil (S to São Paulo; apparently absent from upper Amazon Basin), E Peru, N & E Bolivia, Paraguay and NW & NE Argentina.



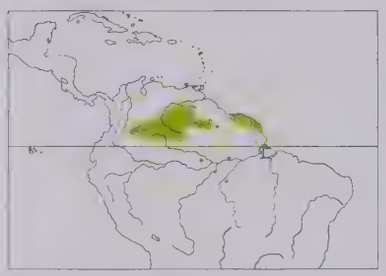
Descriptive notes. 13·5 cm; 13-18 g. Small, nondescript elaenia, slightly elongated crown feathers producing square-shaped crest. Nominate race has head and upperparts uniform greyish-olive, variably sized white coronal patch (semi-concealed), face slightly paler than upperparts, with narrow whitish eyering; wings and tail dusky, wing-coverts tipped white (two broad wingbars), remiges edged whitish; throat grey, becoming greyish-olive on breast, rest of underparts pale yellow; iris dark brown; bill black, flesh-coloured base of lower mandible; legs black. Differs from *E. flavogaster* in having shorter crest, less yellow below. Sexes alike. Juvenile undescribed. Race *brachyptera* is slightly smaller, with darker, more brownish-olive upperparts, greyer breast; *albivertex* has paler underparts than nominate. Voice. Most common call a clear, whistled "weeééa"; other calls include burry "beer-ta" or "chí-bur" or "jwebu", and a longer "freee" similar to but not so loud, hoarse or excited as that of *E. flavogaster*; also, a low "weeb".
Habitat. Open country; found in dry scrub, *cerrado*, river-island scrub, brushy river margins, grassy areas with scattered bushes and trees, open woodland, second growth, plantations, and cultivated areas with hedgerows. Most common in tropical and upper tropical zones, but locally to 2000 m, and recorded as high as 2800 m.
Food and Feeding. Berries and insects. Forages singly or as pair, in somewhat horizontal posture, more erect when calling, usually at eye-level or higher, and obscured by foliage. Makes aerial sallies and perch-gleans. Behaviour similar to that of *E. flavogaster*, but generally less conspicuous.
Breeding. Mar-Jul, Apr-Jun in Trinidad; occasionally two broods. Nest a small cup, lined with few feathers, 1-4 m up in bush or tree. Clutch 2 eggs; incubation by female, may sing while sitting, period 14-15 days; chicks brooded by female, fed by both parents, fledging period 15-16 days.
Movements. Mostly resident. Those breeding in S Brazil apparently migrate N in austral winter, although non-breeding grounds difficult to delineate, in part because same race (*albivertex*) occurs over enormous range E of Andes. Possibly only a breeding visitor in Trinidad, recorded Mar-Aug.
Status and Conservation. Not globally threatened. Uncommon to common; rather rare in Trinidad. Occurs in many national parks and other protected areas throughout its reasonably large range. Dry forests and scrub threatened by fires, cattle browsing, selective logging and slash-and-burn cultivation; in C Brazil government incentives to drain wet forests also lead to habitat loss. On other hand, this species is tolerant of converted and secondary habitats, and should be secure. In addition, shown to be a very important disperser of seeds of tropical fruiting trees (e.g. the rubiaceous *Palicourea rigida*) in savanna regions, as in Venezuelan *llanos*.
Bibliography. Anon. (1998a), Canevari *et al.* (1991), Cavalcanti (1988), Chesser (1997), Cory & Hellmayr (1927), Davis (1993), Friedmann (1948), Friedmann & Smith (1950), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Joseph (1996), Lanyon (1988b), Lowen *et al.* (1996), Marini & Cavalcanti (1998), Narosky & Salvador (1998), Olson (1997), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Salaman (1994), Sick (1993, 1997), da Silva *et al.* (1997), Slud (1964), Snyder (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Skutch (1960), Tostain *et al.* (1992), Traylor (1977), Tubelis (2000), Voous (1983, 1985), Wetmore (1972), Wright *et al.* (1985), Wuetherich *et al.* (2001), Zimmer (1930, 1941a).

33. Rufous-crowned Elaenia

Elaenia ruficeps

French: Élénie tête-de-feu **German**: Rostnacken-Olivtyrann **Spanish**: Fiofío Crestirrufo

Taxonomy. *Elainea* [sic] *ruficeps* Pelzeln, 1868, Borba, Brazil.
Has been hypothesized as being closest to *E. cristata* on basis of nostril structure and wing formula, but the two differ greatly in plumage and behaviour. Monotypic.
Distribution. Very local in SE Venezuela (Bolívar, Amazonas), the Guianas, SE Colombia (Meta E to Guainía and Vaupés) and N Brazil (N Roraima, N Amapá, both sides of middle and lower Amazon, and along R Cururu in S Pará).



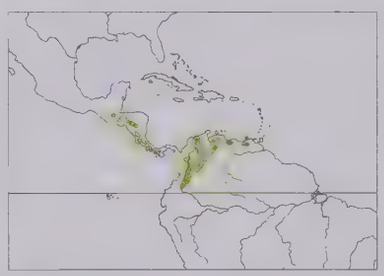
Descriptive notes. 14·5 cm; 19 g. Small elaenia with rather distinctive plumage, slight crest. Has semi-concealed rufous patch on crown (sometimes exposed towards back of head, in the field appearing as a "bump"), faint whitish supercilium, narrow and indistinct white eyering; rest of head, and upperparts, dark olive-brown; wings darker dusky, two whitish wingbars, pale edges of remiges; tail short, dusky; mostly pale yellowish below, blurry greyish-olive flammulations on throat, breast and flanks, unstreaked pale yellow belly and undertail-coverts; iris dark brown; bill black, lower mandible with pale flesh-coloured base; legs black. Sexes alike. Juvenile undescribed. Voice. Song an odd, low-pitched jumble or rattle, given singly at irregular and widely spaced intervals, "chu'd'd'd-u!" or "rr-rr'rd'd'dt", ending abruptly; call (Surinam) "d-rr-rr-rr", with quality resembling that of a trogon (Trogonidae) call.
Habitat. Stunted white-sand forest, savanna with scattered bushes and spiny palms, edges of woodland or gallery forest, and *cerrado* thickets, almost always in areas of sandy soil; lowlands, to 1400 m on tepuis in S Venezuela.
Food and Feeding. Insects, also small fruits. Often found in pairs 1-8 m up in vegetation; perches upright at edges or tops of shrubs, from time to time sings from exposed branches under tree canopy. Less conspicuous than most congeners, but often visits fruiting shrubs, occasionally with mixed-species flocks. Perch-gleans and hover-gleans into foliage for insects.
Breeding. Nest found in Aug in French Guiana; birds with enlarged gonads in Feb-Apr in Colombia. One nest described, a cup of twigs and plant fibres, external diameter 8 cm, internal diameter 5 cm, height 5 cm, depth 3 cm, built in palm frond. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Uncommon to locally common; range highly fragmented. Occurs in Jaú National Park and Maracá Ecological Station, in Brazil. Sandy-soil habitats have hitherto remained mostly unaffected by humans, as soils do not support agriculture.
Bibliography. Cavalcanti (1988), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Marini & Cavalcanti (1998), Mayr & Phelps (1967), Meyer de Schauensee (1982), Novaes (1978a), Ridgely & Tudor (1994), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain (1988e), Tostain *et al.* (1992), Traylor (1977), Zimmer & Hilty (1997).

34. Mountain Elaenia

Elaenia frantzii

French: Élénie montagnarde **German**: Nordanden-Olivtyrann **Spanish**: Fiofío Montano

Taxonomy. *Elainea* [sic] *frantzii* Lawrence, 1865, San José, Costa Rica.
Probably forms a superspecies, and sometimes considered conspecific, with *E. obscura*, possibly also including *E. dayi*. Four subspecies recognized.
Subspecies and Distribution.
E. f. ultima Griscom, 1935 - Guatemala, Honduras and El Salvador.
E. f. frantzii Lawrence, 1865 - Nicaragua, Costa Rica and W Panama.
E. f. pudica P. L. Sclater, 1871 - mountains of N Colombia and N Venezuela (except Santa Marta and Perijá), also through E Andes of Colombia into W Venezuela (N to Lara).
E. f. browni Bangs, 1898 - N Colombia (Sierra Nevada de Santa Marta) and NW Venezuela (Sierra de Perijá).



Descriptive notes. 14 cm; 17 g. Medium sized, dull brownish-olive elaenia with rounded head, no coronal patch. Nominate race is olive-brown above, face paler, distinct yellowish eyering; wings dusky, two prominent yellowish wingbars, yellowish edges of remiges; tail dusky olive; pale olive-yellow below, throat slightly paler than breast, slightly yellower on belly; iris dark brown; bill black, pale flesh-coloured base of lower mandible; legs black. Distinguished from *E. pallatangae* by lack of coronal patch, paler belly. Sexes alike, female slightly smaller. Juvenile has brighter, buffy wingbars. Race *pudica* is smaller than nominate, with smaller bill, darker upperparts, paler underparts, wingbars wider; *browni* resembles previous but even smaller, with paler upperparts; *ultima* is darker than nominate, less greenish above, more olive below. Voice. Whistled "peee-oo" or "twee-oo" and more drawn-out "peee-err" or "speeeer"; prolonged dawn song typically a buzzy "d'weet d'weet" or "ch'weet ch'weet", sometimes interspersed with extra gurgling syllables.
Habitat. Open humid to semi-humid forest, forest edge, overgrown clearings, light second growth, hedgerows and farmland areas with scattered bushes and trees. Mainly in mountains at 750-3600 m; breeds at upper extremes of this range.
Food and Feeding. Fruits and insects; possibly more frugivorous than many others of genus. Forages from low to high levels, usually keeping to denser foliage; posture more horizontal than

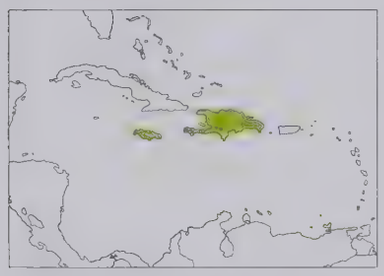
that of many congeners. Perch-gleans and hover-gleans; sometimes flies to ground to glean insects. Gathers in numbers at fruiting trees, and sometimes joins mixed-species foraging flocks.
Breeding. Mar-Nov, but Apr-Jun in Costa Rica; nestlings in Aug in Colombia. Nest built by female, a neat, compact cup of rootlets, mosses, liverworts, often mixed with lichens, inner layer of rootlets and fungal rhizomes, lined with feathers, placed 2-17 m above ground in bush, tree or tall bamboo. Clutch 2 eggs; incubation 15 days; chicks fed by both parents, fledge after 17 days.
Movements. Resident in some areas, but seasonal movements occur, perhaps in response to variations in fruit abundance. In Costa Rica moves to lower levels between Sept and Jan, and becomes uncommon, suggesting emigration (perhaps to S); marked seasonal and local population shifts in Colombia and Venezuela, where may withdraw from higher elevations after breeding.
Status and Conservation. Not globally threatened. Uncommon to very common. The commonest tyrannid in W Chiriquí highlands, in Panama. Occurs in Rancho Naturalista, in Costa Rica, Tambito Nature Reserve, in Colombia, and in most national parks in mountain ranges of Colombia and N Venezuela.
Bibliography. Anon. (1998a), Barrantes & Pereira (2002), Blake (1958), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Komar (2002), Land (1970), Lanyon (1988b), Marini & Cavalcanti (1998), Meyer de Schauensee (1982), Miller (1963), Moermond (1985), Monroe (1968), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Skutch (1967), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Strewe & Navarro (2003), Traylor (1977), Varty *et al.* (1986), Wetmore (1972).

35. Greater Antillean Elaenia

Elaenia fallax

French: Élénie sara **German**: Hispaniolaolivtyrann **Spanish**: Fiofío Canoso
Other common names: Antillean Elaenia

Taxonomy. *Elainea* [sic] *fallax* P. L. Sclater, 1861, Jamaica.
Two subspecies recognized.
Subspecies and Distribution.
E. f. fallax P. L. Sclater, 1861 - Jamaica.
E. f. cherriei Cory, 1895 - Hispaniola.



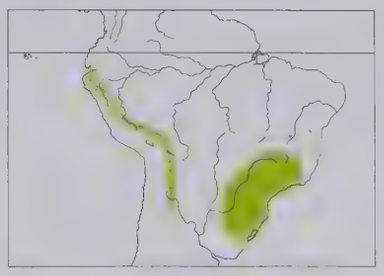
Descriptive notes. 15 cm. Small elaenia with faint eyeline, lightly streaked breast; head appears slightly crested. Nominate race has head and upperparts uniform olive-brown, whitish coronal patch (usually concealed), white or pale yellowish-white loral spot and faint eyering, indistinct narrow dusky eyeline; wings dusky, two whitish wingbars, pale edges of remiges; tail dusky; throat and underparts washed with dull yellow, breast faintly streaked or washed with dull olive; iris dark brown; bill short, black, lower mandible pink with black tip; legs black. Sexes alike, female slightly smaller. Juvenile lacks coronal patch. Race *cherriei* is duller, less brown, above than nominate, much paler below, chin and throat mostly greyish-white. Voice. Harsh "pwee-chi-chi-chiup", "see-ere" or "chewit-chewit", given only in breeding season; dawn song a harsh trill, repeated many times.
Habitat. Humid montane and lowland forest, forest edge, pine (*Pinus*) forest, thickets, and open country with scattered trees; mostly 500-2000 m.
Food and Feeding. Insects and fruits. Frequently forages in pairs, but will join mixed-species flocks. Forages from low levels to high in canopy; sallies to glean insects from leaves and twigs, also hover-gleans for fruits.
Breeding. May-Jun. Nest a moss cup with feather lining, built low in bush to high in tree. Clutch 2 eggs; incubation and fledging periods not recorded.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Jamaica EBA and Hispaniola EBA. Locally common. In Jamaica, 75% of original forest cover already cleared and remaining forest largely second growth; undisturbed forest survives only on high mountain slopes, some of which protected in Blue Mountain and John Crow National Park, but hunting and habitat destruction continue because of lack of funds for effective protection and management; resurgence in coffee cultivation since 1980s led to clearance of much second growth, and other problems include hurricane damage, widespread pesticide use, planting of pines, timber removal, deliberate fires, and continuing conversion for small-scale farming and urbanization. In Hispaniola, Haiti is one of the world's most environmentally degraded countries, with survival forests covering less than 1·5% of the country's area, while only c. 10% of forests remain in Dominican Republic; these continue to be degraded and fragmented by logging, slash-and-burn agriculture, charcoal production, and replacement with pine plantations; only two small national parks exist in Haiti, and c. 22 protected areas (with 15 new areas proposed) covering c. 16% of land area of Dominican Republic, but lack of adequate funding threatens their long-term survival.
Bibliography. Anon. (1998a), Bond (1928a, 1985), Cory & Hellmayr (1927), Dod (1987, 1992), Faaborg (1985), Gochfeld (1985), Keith *et al.* (2003), Lanyon (1988b), Marini & Cavalcanti (1998), Raffaele *et al.* (1998, 2003), Ridgway (1907), Stotz *et al.* (1996), Wetmore & Swales (1931).

36. Highland Elaenia

Elaenia obscura

French: Élénie obscure **German**: Hochland-Olivtyrann **Spanish**: Fiofío Oscuro

Taxonomy. *M[uscipeta] obscura* d'Orbigny and Lafresnaye, 1837, Yungas of Bolivia.
Probably forms a superspecies, and sometimes considered conspecific, with *E. frantzii*, possibly also including *E. dayi*. Two subspecies recognized.
Subspecies and Distribution.
E. o. obscura (d'Orbigny & Lafresnaye, 1837) - E slope of Andes from S Ecuador (Azuay, Loja) S to Bolivia and NW Argentina (S to Tucumán).
E. o. sordida J. T. Zimmer, 1941 - Brazil (S Mato Grosso do Sul E to Minas Gerais, locally to S Bahia, and S to Rio de Janeiro and Rio Grande do Sul), E Paraguay, NE Argentina and N Uruguay.
Descriptive notes. 16 cm; 24-27 g. Large, dark, small-headed elaenia lacking crest and pale coronal patch, appearing short-billed and long-tailed. Considerable individual variation evident in both races. Plumage is uniform dark greyish-olive above, dusky loral spot, narrow whitish eyering; wings dusky, two pale yellowish wingbars, pale edgings of remiges; tail long, dusky, tipped white



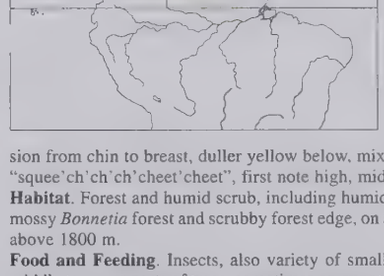
when fresh; throat pale yellow, fading to dull olive on breast and flanks, belly pale yellow; iris dark brown; bill black, flesh-coloured base of lower mandible; legs black. Sexes alike, female slightly smaller. Juvenile is dark rufescent brown above, dirty greyish-white below. Race *sordida* is on average larger than nominate, also darker, duller, more olive and less brownish above, less contrast between head and back, darker below, more grey on throat, breast and flanks. Voice. Call (in Andes) a fast "burrrr" or "burrreep"; song (Argentina) a complex phrase, "chee-chooit, chu-wheeo-chu-wee", as from a thrush (Turdidae). In Brazil (*sordida*) also a wren-line "kraaa", like that of a wren (Troglodytidae), and a single-pitched trill.
Habitat. Edges and undergrowth of humid forest and secondary woodland, and stunted cloudforest; often found in forest fragments and in small patches of young second growth. At 1700-3000 m in Andes; sea-level to 2000 m in Brazil.
Food and Feeding. Insects and berries. Often perches upright high in canopy, on outer branches 1-2 m below treetop; usually solitary and inconspicuous, remaining hidden in cover more than most congeners. Sallies up to 1 m above canopy; also perch-gleans and hover-gleans for both insects and berries.
Breeding. Oct-Feb (fledglings in Feb) in Bolivia, mainly Jan in Argentina; nest at end Oct and birds with enlarged gonads in Oct and Nov in Brazil. Nest a simple neat cup 8-9 cm in diameter, 5-6 cm in height, decorated with moss and lichens, interior lined with feathers, in bush or tree. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. None recorded; single record from Bahia (Brazil) could have involved a wanderer outside breeding season.
Status and Conservation. Not globally threatened. Rare to fairly common and local; rare and very local in Ecuador. Can be found in any protected area along E Andean slope from Peru S to NW Argentina; in Brazil, occurs in Serra da Canastra and Caraça National Parks, Intervales State Park and Volta Velha Reserve. Accepts rather disturbed habitats, as well as fragmented habitats.
Bibliography. Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Chapman (1921), Cory & Hellmayr (1927), Cracraft (1985), Dubs (1992), Fjeldså & Krabbe (1990), Hayes (1995), Herzog *et al.* (1999), Lanyon (1988b), Lowen *et al.* (1996), Marini & Cavalcanti (1998), Meyer de Schauensee (1982), Naka *et al.* (2001), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rocha (2000), do Rosário (1996), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Willis (1988), Zimmer (1930, 1941a)

37. Great Elaenia

Elaenia dayi

French: Élénie de Day **German**: Riesenolivtyrann **Spanish**: Fiofío de Day
Other common names: Giant Elaenia; Duida Elaenia (*tyleri*)

Taxonomy. *Elaenia dayi* Chapman, 1929, Cerro Roraima, 8600 feet [c. 2620 m], Venezuela.
Apparently most closely related to *E. obscura* on basis of wing shape and plumage pattern; may be part of superspecies formed by that species and *E. frantzii*. Three subspecies recognized.
Subspecies and Distribution.
E. d. tyleri Chapman, 1929 - mountains of SC Venezuela in Amazonas (cerros Parú, Huachamacari, Marahuaca, Duida) and SW Bolívar (Meseta de Jaua).
E. d. auyantepui J. T. Zimmer & Phelps, Sr, 1952 - Auyán-tepui, in SE Bolívar.
E. d. dayi Chapman, 1929 - mountains and Gran Sabana of SE Venezuela (cerros Ptari-tepui, Chimantá-tepui, Kukenam, Roraima); probably also in adjacent Guyana.



Descriptive notes. 20 cm. Large, dark, long-tailed elaenia with very rounded head, at most only slight crest, and no coronal patch. Plumage is dark sooty brown above, blacker on crown, narrow broken whitish eyering; two dull whitish wingbars, narrow whitish edging on tertials; tail dusky; mostly dull olive-grey below, throat slightly paler, becoming pale yellowish on belly; iris dark brown; bill small, black, pale flesh-coloured base of lower mandible; legs black. Sexes alike, female slightly smaller. Juvenile undescribed. Race *tyleri* is notably larger than nominate; *auyantepui* is smaller and darker than previous, grey suffusion from chin to breast, duller yellow below, mixed with greyish on breast. Voice. Peculiar, loud "squee'ch'ch'ch'cheet'cheet", first note high, middle notes rattling.
Habitat. Forest and humid scrub, including humid forest, open forest, stunted savanna woodland, mossy *Bonnetia* forest and scrubby forest edge, on slopes and summits at 300-2600 m; most records above 1800 m.
Food and Feeding. Insects, also variety of small fruits. Solitary or in pairs. Perches upright in middle to upper parts of trees, sometimes on exposed branches, sometimes within canopy or shrubbery. Perch-gleans and hover-gleans in foliage.
Breeding. Unrecorded.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tepuis EBA. Rare to fairly common; more numerous at higher elevations, and most common during rainy season on Cerro Roraima (above 2000 m). Most sites lie within national parks. The tepuis within its range are generally inaccessible, and therefore not overly affected by human disturbance, but vegetation is especially sensitive to fire and other disturbances. Gold-prospecting and uncontrolled tourism have recently had severe local impacts.
Bibliography. Chapman (1931), Cory & Hellmayr (1927), Cracraft (1985), Gilliard (1941), Hilty (2003), Lanyon (1988b), Marini & Cavalcanti (1998), Mayr & Phelps (1967), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977).

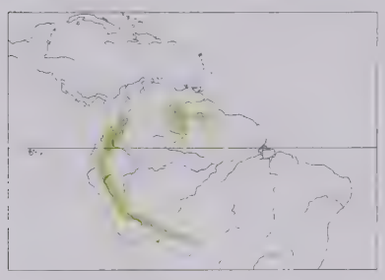
38. Sierran Elaenia

Elaenia pallatangae

French: Élénie de Pallatanga **German**: Sierraolivtyrann **Spanish**: Fiofío de Pallatanga

Other common names: Roraiman Elaenia (*olivina*)

Taxonomy. *Elainea* [sic] *pallatangae* P. L. Sclater, 1862, Pallatanga, Chimborazo, Ecuador.
Apparently closely related to *E. albiceps*; the two possibly hybridize in Ecuador. Geographically remote race *olivina* has been considered a separate species, which may be preferable treatment; position of *davidwillardi* unclear. Five subspecies recognized.
Subspecies and Distribution.
E. p. pallatangae P. L. Sclater, 1862 - Andes of S Colombia and Ecuador.
E. p. intensa J. T. Zimmer, 1941 - Andes of Peru.
E. p. exsul Todd, 1952 - known only from type locality of Incachaca (Cochabamba), in Bolivia.
E. p. olivina Salvin & Godman, 1884 - tepui region of S Venezuela and adjacent N Brazil and Guyana.
E. p. davidwillardi Dickerman & Phelps, Jr, 1987 - Cerro de la Neblina, in extreme S Venezuela (S Amazonas).



Descriptive notes. 14·5 cm; 15-19 g. Small elaenia with rounded head lacking crest, narrow white coronal stripe usually visible. Nominate race is olive above, with yellowish eyering and lores, face with more yellow tinge than upperparts; wings and tail duskier, two conspicuous yellowish-white wingbars, pale edges of remiges; chin whitish, lower throat and breast yellowish-olive, becoming pale yellow on belly and undertail-coverts; iris dark brown; bill black, base of lower mandible flesh-coloured; legs black. Differs from *E. frantzii* in white coronal stripe, yellower underparts; from *E. albiceps* and *E. parvirostris* in yellow coloration below. Sexes alike, female slightly smaller. Juvenile has coronal patch smaller or absent. Race *intensa* is more intensely yellow below, crown less dark, nearer to colour of back; *exsul* is similar to previous, possibly brighter yellow, though this may be due to comparison with faded specimens; *olivina* is browner above, darker and more uniformly olive below, bill somewhat longer; *davidwillardi* is similar to previous, but with upperparts darker olive-brown and underparts brighter. Voice. Call a sharp clear "wheeu", similar to that of *E. albiceps* but lacking burry quality, also abrupt burry "breeyup" or "wree-yr"; in Venezuela (race *olivina*) "pfeéeu".
Habitat. Humid montane forest edge and shrubby clearings, brushy pastures, stunted montane scrub around edges and rocky openings; also second growth dominated by melastomes (Melastomataceae). At 1500-3000 m, locally down to 1000 m and up to 3650 m, in Andes; lower, 900-2400 m, in NE range (*olivina*, *davidwillardi*).
Food and Feeding. Insects; fruits, especially of mistletoes (Loranthaceae) and melastomes, eaten extensively. Less active and conspicuous than congeners; perches quietly and erect for long periods of time, at all levels from understorey to canopy. Often joins mixed-species flocks. Perch-gleans insects in foliage.
Breeding. Birds with enlarged gonads in Jan-Aug in Colombia, Oct-Nov in Peru and Feb-Apr in Venezuela. Nest a neat cup, 1 m up in fork in bush. Clutch 2 eggs; incubation and fledging periods not recorded.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to common; fairly common in Venezuela. In Ecuador, more abundant in S than in N. Occurs in several protected areas, including e.g. Tambito Nature Reserve, in Colombia, Cotacachi-Cayapas Ecological Reserve, Cotopaxi and Podocarpus National Parks, in Ecuador, and Canaíma National Park, in Venezuela; present in every protected area along E Andean slope in Peru and NW Bolivia.
Bibliography. Chapman (1931), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Dickerman (1987), Dickerman & Phelps (1987), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Marini & Cavalcanti (1998), Mayr & Phelps (1967), Meyer de Schauensee (1982), Miller (1963), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Willard *et al.* (1991), Zimmer (1930, 1941a).

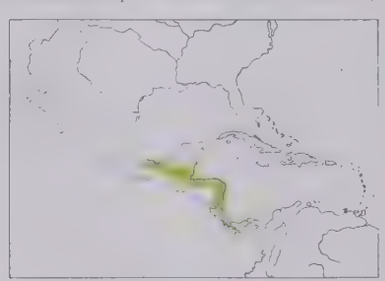
Genus *ORNITHION* Hartlaub, 1853

39. Yellow-bellied Tyrannulet

Ornithion semiflavum

French: Tyranneau à ventre jaune **Spanish**: Mosquerito Ventriamarillo
German: Gelbbauch-Kleintyrann

Taxonomy. *Tyrannulus semiflavus* P. L. Sclater and Salvin, 1860, Choctum, Alta Verapaz, Guatemala.
Formerly placed in a separate genus, *Microtriccus*, together with *O. brunneicapillus*. The two form a superspecies; previously considered conspecific, but now split by most authors on basis of plumage, voice and habitat, also no apparent intergradation where ranges come together in Costa Rica. Monotypic.
Distribution. S Mexico (Veracruz, Tabasco, Chiapas), Guatemala, Belize, Honduras, Nicaragua and Pacific slope of Costa Rica and W Panama (W Chiriquí).



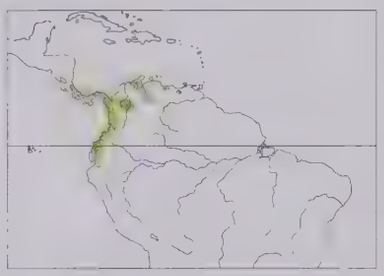
Descriptive notes. 8 cm; 7-8 g. Has white forehead, lores and supercilium; slate-grey crown contrasting sharply with bright olive upperparts; wings and tail dusky olive; auriculars and face olive-brown, entire underparts pure bright yellow, only faintly flammulated with olive on breast and flanks; iris brown; bill compressed laterally, culmen distinctly arched and sharply pointed, black; legs dark grey. Sexes alike. Juvenile has crown and upperparts tinged brownish, underparts paler, throat and breast faintly streaked. Voice. Strong, clear, high-pitched, plaintive "deee" or "peeer", sometimes given as piercing series of 4-6 notes, on even pitch or descending slightly; call note a hard, nasal "biihk-biihk", sometimes repeatedly and interspersed with single "deee" notes; dawn song an incessantly repeated "dee-dee-whi'chu" or somewhat nasal jumble of notes, "t-chee-ee-ee, eee-eee-eet" or "t-chi-ee, pee-pee-pee, t-chi-ee-t-chi-ee…".
Habitat. Humid tropical evergreen forest, forest edge, older second growth, plantations and gardens with tall trees, and tall semi-deciduous scrub; sea-level to 1500 m.
Food and Feeding. Arthropods. Forages singly or in pairs; occasionally joins mixed-species flocks. Actively flits from perch to perch in dense foliage, usually in forest canopy, but descends along edges; mainly perch-gleans from leaves, twigs and stems. Behaviour like that of a parulid warbler or a vireo (Vireonidae).
Breeding. Poorly known. Season probably Mar-Jun. Nest uncertain, possibly globular, placed in camouflaged setting such as in dead *Cecropia* leaf or clump of living bromeliads. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common; probably often overlooked. Occurs in Río Bravo Conservation and Management Area, Columbia River Forest Reserve and Lamanai Archaeological Reserve, all in Belize, Laguna del Tigre National Park, in Guatemala, and Río Negro Jaguar Reserve and Tarcol Lodge, both in Costa Rica.
Bibliography. Anon. (1998a), Blake, E.R. (1953), Brodkorb (1943), Cory & Hellmayr (1927), Eisenmann (1955), González-García (1993), Howell & Webb (1995a), Land (1970), Lee Jones (2004), Meyer de Schauensee (1982), Monroe (1968), Russell (1964), Slud (1964), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Traylor (1977).

40. Brown-capped Tyrannulet

Ornithion brunneicapillus

French: Tyranneau à tête brune **Spanish**: Mosquerito Coronipardo
German: Braunkappen-Kleintyrann

Taxonomy. *Tyrannulus brunneicapillus* Lawrence, 1862, Isthmus of Panama.
Formerly placed in a separate genus, *Microtriccus*, together with *O. semiflavum*. The two form a superspecies; previously considered conspecific, but now split by most authors on basis of plumage, voice and habitat, also no apparent intergradation where ranges come together in Costa Rica. Birds from N Colombia (Santa Marta region) and NW Venezuela described as race *dilutum*, supposedly slightly paler below on average, but not reliably distinguishable from other populations. Monotypic.
Distribution. Caribbean slope of Costa Rica S to W & N Colombia, W Ecuador, and locally in W & N Venezuela (E to S Miranda).



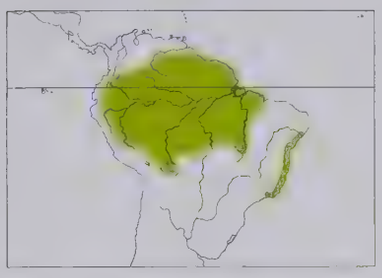
Descriptive notes. 8 cm; 7-8 g. Has white forehead, lores and supercilium, brownish-olive to dark brown crown, olive upperparts; wings and tail dusky olive; auriculars and face olive, entire underparts bright yellow, faintly flammulated with olive (especially on breast and flanks); iris brown; bill compressed laterally, culmen distinctly arched and sharply pointed, black; legs dark grey. Sexes alike, female slightly smaller. Juvenile has crown more olive, supercilium less distinct, upperparts browner, wing-coverts with small pale tips, underparts paler. Voice. Series of 4-6 high metallic or piping whistles, each slightly downward-slurred, slight pause after first note, "pee, pey-pey-pew"; also single high-pitched "peeep".
Habitat. Humid tropical and upper tropical evergreen forest, including forest edge and older second growth, also adjacent clearings and plantations; sea-level to 1200 m, mainly below 600 m.
Food and Feeding. Insects. Forages singly or in pairs; occasionally joins mixed-species flocks. Actively flits from perch to perch in dense foliage, usually in forest canopy, also descending lower, especially along edges; mainly perch-gleans from leaves, twigs and stems. Behaviour like that of a parulid warbler or a vireo (Vireonidae).
Breeding. Jan-Aug. Nest an untidy flat saucer of fine twigs, leaf petioles and bark, placed c. 3·5-12 m up on small fork in understorey tree. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common; probably often overlooked. In Venezuela, fairly common on E slope of Andes near Barinitas, and present also in Henri Pittier National Park. Occurs also in Río Claro Reserve and Tayrona National Park, both in Colombia, and Tinalandia Private Reserve and Río Palenque Science Centre, both in Ecuador.
Bibliography. Anon. (1998a), Blake, E.R. (1953), Chapman (1917c), Cory & Hellmayr (1927), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Slud (1960, 1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Strewe & Navarro (2003), Traylor (1977), Wetmore (1972), Willis (1980), Willis & Eisenmann (1979), Zimmer (1941c).

41. White-lored Tyrannulet

Ornithion inerme

French: Tyranneau minute **German**: Weißzügel-Kleintyrann **Spanish**: Mosquerito Moteado

Taxonomy. *O[rnithion] inerme* Hartlaub, 1853, Bahia, Brazil.
Monotypic.
Distribution. E & SE Colombia, S & SE Venezuela and the Guianas S to E Ecuador, E Peru, N Bolivia and N, W, & C Brazil (Amazonia E to E Pará and NW Maranhão); also, apparently isolated coastal population in E Brazil (Alagoas S to Rio de Janeiro).
Descriptive notes. 8 cm; 6-8 g. Has grey to dark grey crown, white lores and broken eyering (meeting over bill to form narrow "spectacle"); upperparts greyish-olive; wings dusky, wing-coverts broadly tipped white (two distinctive wingbars of individual spots), inner remiges narrowly edged pale yellow-green; tail dusky; auriculars and face greyish, throat white, grading to pale olive-yellow on breast, pure pale yellow belly; iris brown; bill compressed laterally, culmen distinctly arched and sharply pointed, black; legs dark grey. Sexes alike, female slightly smaller. Juvenile is duller than adult. Voice. Persistent, piercing series of 4-7 clear piping notes, "peee, dee-dee-deet", sometimes delivered every 5-15 seconds for minutes on end; also single sharp "peeet".
Habitat. Humid tropical and upper tropical evergreen forest, gallery forest, swamp-forest, *várzea* forest, tall white-sand scrub-forest, and mature second growth; in Andean foothills prefers edges and openings, such as treefalls, landslides and barrancas. Sea-level to 1000 m, locally to 1200 m.



Food and Feeding. Arthropods. Forages singly or in pairs; occasionally joins mixed-species flocks. Actively flits from perch to perch in dense foliage, usually in forest canopy, also descending to 2 m along edges and brushy openings in forest; mainly perch-gleans from leaves, twigs and stems. Behaviour like that of a parulid warbler or a vireo (Vireonidae).
Breeding. Birds with enlarged gonads, also juveniles seen, in Dec in Peru. No other information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common; probably often overlooked. Occurs in many national parks and other protected areas throughout its large range, including e.g. Jaú and Tapajós National Parks, Guaribas (Paraíba) and Sooretama Biological Reserves, Murici Ecological Reserve and Dois Irmãos Ecological Reserve, all in Brazil; Tambopata-Candamo Reserved Zone and Manu National Park and Biosphere Reserve, in Peru; and Pilón Lajas Biosphere Reserve and Amboró, Madidi and Noel Kempff Mercado National Parks, in Bolivia. Accepts reasonably wide range of habitats, including secondary ones; considered unlikely to be at any risk.
Bibliography. Allen (1995), Begazo (1995), Chapman (1931), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Fitzpatrick (1980c), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1982), Naka (2004), Oren & Parker (1997), Parker & Remsen (1987), Parker *et al.* (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Roda & Carlos (2003), Schulenberg *et al.* (2001), Scott & Brooke (1985), Sick (1993, 1997), Silveira *et al.* (2003), Snyder (1966), Stotz *et al.* (1996), Teixeira *et al.* (1989), Tostain *et al.* (1992), Traylor (1977), Zimmer (1941c).

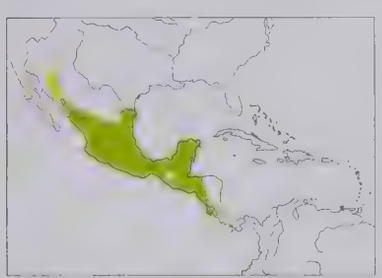
Genus *CAMPTOSTOMA* P. L. Sclater, 1857

42. Northern Beardless Tyrannulet

Camptostoma imberbe

French: Tyranneau imberbe **Spanish**: Mosquerito Imberbe
German: Nördlicher Blasskleintyrann
Other common names: Beardless Flycatcher

Taxonomy. *Camptostoma imberbe* P. L. Sclater, 1857, San Andrés Tuxtla, Veracruz, Mexico.
Forms a superspecies with *C. obsoletum*; the two overlap slightly without intergrading in WC Costa Rica. Birds from S USA (Arizona) and NW Mexico, supposedly longer-billed, more olive above and more yellow below, described as race *ridgwayi*; others, from Cozumel I, named as *thyellophilum* on basis of minute differences in mean culmen length in a small sample; both, however, considered indistinguishable from other populations. Monotypic.
Distribution. S USA (S Arizona, S Texas) and Mexico (including Yucatán Peninsula and islands of Holbox and Cozumel) S to NW Costa Rica.



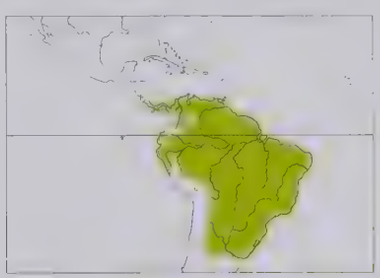
Descriptive notes. 9·5-10·5 cm; c. 7 g. Pale, drab tyrannulet with slight crest. Plumage is pale greyish-olive above, crown slightly darker, lores and thin broken eyering whitish; wings dusky greyish, wing-coverts and remiges broadly but diffusely edged pale buff to creamy white (two broad wingbars); tail greyish-olive; throat and face greyish-white, grading to pale greyish-olive on breast and clear, very pale yellow to whitish on belly; iris brown; bill long, upper mandible curved and sharply pointed, horn-coloured above, pale flesh-coloured below; legs grey. Sexes alike. Juvenile is yellower below. Voice. Main call a thin but piercing whistle, "fleeeeer", sometimes with thin terminal syllable, "fleeeeee-rit"; also descending series of clear whining notes, "fleee, flee-flee-flee" or "peer-peer-peer".
Habitat. Wide variety of semi-open habitats, including lowland scrub, riparian habitats, brushy savanna, cactus desert, arid thorn-scrub, brushy woodland, tropical deciduous and semi-deciduous forest, cottonwood (*Populus*) groves, mesquite (*Prosopis*), associations with sycamore (*Acer*), live oak (*Quercus*) and mesquite, also second growth, gardens, plantations, and city parks; avoids tall evergreen forest except along roads and other breaks. Mostly below 500 m, but regularly to 1500 m; occasionally to 2100 m.
Food and Feeding. Arthropods; berries and small fruits eaten extensively where available. Forages mainly with active, parulid-style perch-gleaning, flitting rapidly from perch to perch, usually near tips of shrubs and in crowns of trees, also in understorey down to 1 m; often flicks wings and tail nervously. Occasionally hover-gleans, rarely makes aerial sallies.
Breeding. Mar-Aug (to Sept during rainy years) in S USA and Mar-Jun in Middle America; often two broods. Nest bulky, globular, with side entrance sometimes covered by shallow roof, thick-walled, of loosely packed grasses, weed stems, dried leaves, bark and fibres, internal cup padded with soft plant down, fur or feathers; suspended from twigs near outer edge of shrub, or bound with spiderwebs and plant down to stem, in epiphyte or in low palmetto. Clutch 2-3 eggs, rarely 4; incubation and fledging periods not known, but (on partial data) estimated at, respectively, 14-16 days and c. 12 days; incubation and brooding appear to be exclusively by female; both parents attend young; female may begin building second nest while male feeds young at first.
Movements. Populations in extreme N migratory, winter in S portion of breeding range.
Status and Conservation. Not globally threatened. Rare to uncommon in N; more common in S. Overall population estimated at 2,000,000 birds. Survey data for USA suggest no apparent trend between 1966 and 1979, though possibly declining throughout much of N part of range owing to deforestation resulting from farming, cattle-raising and timber extraction; for example, the species is now considered rare in El Salvador following removal of much of its forest habitat; small Texas population threatened by deterioration of riparian forest. Might benefit from creation of further reserves in lowland tropical deciduous forest; as it avoids mature forest, however, it may benefit from light forest disturbance. Fairly common to common from Mexico to Costa Rica; occurs in Río Bravo Conservation and Management Area and Lamanai Archaeological Reserve, both in Belize, and Laguna del Tigre National Park, in Guatemala.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bent (1942), Binford (1989), Brodkorb (1943), Brush (1998, 1999b), Contreras (1997), Cory & Hellmayr (1927), DeGraaf & Rappole (1995), Fitzpatrick (1980a), Griscom (1934), Howell & Webb (1995a), Hutto (1992), Kaufman (1996), Land (1970), Lee Jones (2004), Lowery & Dalquest (1951), Monroe (1968), Oberholser (1974), Parkes & Phillips (1999), Paynter (1955), Price *et al.* (1995), Ridgway (1907), van Rossem (1930), Rowley (1962, 1984), Skutch (1997), Slud (1964, 1980), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Sutton (1951), Tenney (2000), Thurber *et al.* (1987), Traylor (1977), Udvardy (1963), Wetmore (1943).

43. Southern Beardless Tyrannulet

Camptostoma obsoletum

French: Tyranneau passegris **German**: Südlicher Blasskleintyrann **Spanish**: Mosquerito Silbón

Taxonomy. *Muscicapa obsoleta* Temminck, 1824, Curitiba, Paraná, Brazil.
Forms a superspecies with *C. imberbe*; the two overlap slightly without intergrading in WC Costa Rica. Numerous races have been described, many of which weakly defined and intergrade broadly with neighbouring ones. Races form five geographically and morphologically discrete groups, within which the various taxa could arguably be merged: Central American (*flaviventre*, *orphnum*, *majus*), N South American (*pusillum*, *caucae*, *napaeum*), W South American (*sclateri*, *maranonicum*, *griseum*), W Amazonian (*olivaceum*) and C South American (*bolivianum*, *cinerascens*, nominate). Some of these groups possibly merit status of full species; this especially true of extreme W Amazonian *olivaceum*, which sharply bounded on all sides by much paler races and, moreover, is believed to have distinctive vocalizations. Other described races are *venezuelae* (N Venezuela), considered indistinguishable from *pusillum*, and *bogotense* (upper Magdalena Valley, in Colombia), merged with *caucae* as it represents a barely discernible intergrade between that taxon and *pusillum*. Thirteen subspecies recognized.
Subspecies and Distribution.
C. o. flaviventre P. L. Sclater & Salvin, 1865 - Pacific coast of Costa Rica and both coasts of Panama.
C. o. orphnum Wetmore, 1957 - Coiba I, off SW Panama.
C. o. majus Griscom, 1932 - Pearl Is, off S Panama.
C. o. pusillum (Cabanis & Heine, 1859) - N Colombia (Caribbean coast, Magdalena Valley S to Santander), N Venezuela (E to Sucre, S to Táchira, Barinas, Apure, N Amazonas and N Bolívar) and Trinidad.
C. o. caucae Chapman, 1914 - C Colombia (W slope of W Andes, Cauca Valley, upper Magdalena Valley).
C. o. napaeum (Ridgway, 1888) - S Venezuela (Amazonas, SE Bolívar), the Guianas, E Peru, and N Brazil (E Amazonas, Pará, Amapá).
C. o. sclateri (Berlepsch & Taczanowski, 1883) - W Ecuador and extreme NW Peru (Tumbes, N Piura).
C. o. maranonicum Carriker, 1933 - N Peru (extreme E Piura, and middle Marañón Valley in Amazonas, E Cajamarca and E Ancash).
C. o. griseum Carriker, 1933 - arid Pacific coast and slopes of W Peru (Lambayeque S to Lima).
C. o. olivaceum (Berlepsch, 1889) - SE Colombia, E Ecuador, NW Peru and W Brazil (W Amazonas).
C. o. bolivianum J. T. Zimmer, 1941 - C Bolivia (E La Paz, Cochabamba) and NW Argentina (S to Tucuman).
C. o. cinerascens (Wied, 1831) - E Brazil (Maranhão E to Ceará, S to C Mato Grosso and Espírito Santo) and E Bolivia (E Santa Cruz).
C. o. obsoletum (Temminck, 1824) - S Brazil (S Mato Grosso E to Rio de Janeiro, S to Rio Grande do Sul) S to Paraguay, C & NE Argentina (S to La Pampa and Entre Ríos) and Uruguay.



Descriptive notes. 9·5-10·5 cm; 7-9 g. Drab tyrannulet with parulid-like bill, somewhat bushy crest. Nominate race is medium olive-grey above, slightly greyer on crown, crown feathers often elongated with dark centres; lores and thin broken eyering whitish; wings dusky, wing-coverts with broad cinnamon tips (two wingbars), inner remiges broadly edged whitish to creamy white, pale margin of innermost remiges especially wide; throat and face greyish-white, grading to pale yellow on underparts, washed slightly olive on breast; iris brown; bill long, upper mandible curved and sharply pointed, horn-coloured above, pale flesh-coloured below; legs grey. Sexes alike. Juvenile is duller and browner than adult, wingbars duller, pale buffish-white below. Race *bolivianum* is very like nominate but slightly larger; *cinerascens* is slightly paler below, greyer overall; *maranonicum* is smaller and much paler than previous, pale grey-brown with only slight olive tinge above, wingbars and edges of inner remiges slightly to deeply tinged cinnamon-buff, underparts creamy white, warm grey suffusion on breast; *griseum* is also small and pale, somewhat darker than last; *sclateri* differs from previous in having uppertail-coverts dull cinnamon; *caucae* is drab greyish-olive above, crown variably darker, wingbars creamy white to pure white, very pale yellow below, breast distinctly suffused greyish to greyish-olive; *pusillum* is on average slightly smaller than last; *napaeum* is on average slightly darker olive above than previous two; *olivaceum* is distinctive, olive above, crown dark olive, wingbars pale yellow-green to whitish, inner remiges edged bright yellow-green, underparts bright yellow; *flaviventre* is warm greyish-olive above, crown somewhat darker and slightly crested, broad wingbars and broad edges of inner remiges creamy white, underparts deeply suffused with yellow; *majus* is slightly greyer than last, crown slightly lighter, more like back; *orphnum* is extremely small, has very dark crown. Voice. Thin, high whistle, "fleeeeer", rising and falling slightly, sometimes with terminal syllables, "fleeeeee-pit-pit"; also descending series of clear, minor-key notes, "fleee, flee-fleew-fleew"; all loud calls often delivered with crown feathers raised into noticeable crest.
Habitat. Variety of scrub habitats, including cactus desert, arid thorn-scrub, deciduous forest, gallery forest, edges of humid forest, second growth, gardens, city parks, river margins, viny borders of oxbow lakes; generally avoids interior of humid forest, but occasionally found in canopy of *várzea* and swamp-forest. Lowlands, to c. 2000 m; locally to 2800 m, rarely to 3120 m.
Food and Feeding. Insects and spiders; also feeds extensively on berries, e.g. of mistletoes (Loranthaceae), and small fruits. Generally alone or in pairs; sometimes follows mixed-species flocks. Forages mainly with active, parulid-style perch-gleaning, flitting rapidly from perch to perch near tips of shrubs and in crowns of trees, often flicking wings and tail nervously; tail often held slightly cocked, crown feathers often partially raised. Occasionally hover-gleans, rarely makes aerial sallies.
Breeding. Dec-Mar in Middle America and Venezuela, Feb-Apr (also Jul, Oct-Nov) in Trinidad, Sept-Dec in Surinam, Jan-Jun in N Colombia, Jan-Mar in NW Amazonia, Feb-Jun in arid W Ecua-

dor. Aug-Dec in Brazil, Aug-Jan in Argentina and Sept-Feb in Uruguay. Nest, apparently built by female alone, a bulky, globular structure with side entrance, adorned with leaves, grasses, liverworts, twigs, vine tendrils, spiderwebs, wasp-nest material, and cocoon cases, lined with finer material such as seed down; 1-30 m above ground, well concealed and well supported among vines or branches, or suspended from leaf petioles, in one case attached directly to pensile nest of another flycatcher (probably *Tolmomyias flaviventris*); of 20 nests in Ecuador, twelve were placed within 1 m of an active wasp nest. Clutch usually 2 eggs, rarely 3; incubation period 14-15 days; chicks fed by both parents, fledging period c. 17 days.
Movements. Largely resident; not known to be migratory, but populations in extreme S may move N during austral winter.
Status and Conservation. Not globally threatened. Fairly common to very common, and widespread; uncommon and local in some areas (e.g. E Ecuador). Occurs in numerous national parks and other protected areas throughout its very large range. Preference for scrub, lighter woodland and semi-open habitats makes it less susceptible to forest degradation and disturbance than are many other tyrannids; able to exploit converted habitats.
Bibliography. Anon. (1998a), Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Chapman (1917c, 1926), Chesser (1997), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Di Giacomo (2004), Fitzpatrick (1980c, 1981), Fjeldså & Krabbe (1990), ffrench (1991), Haffer (1975), Haverschmidt (1954, 1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995a), Hudson (1920), Land (1970), Lanyon (1988b), Lowen *et al.* (1996), Marchant (1960), Miller (1963), Miserendino (1998), Narosky & Salvador (1998), Olson (1997), Oren & Parker (1997), de la Peña (1987, 1988), Perry *et al.* (1997), Pople *et al.* (1997), Quiroga *et al.* (1998), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robinson & Terborgh (1997), do Rosário (1996), Salaman (1994), Short (1975), Sick (1993, 1997), Skutch (1981, 1985), Slud (1964), Staicer *et al.* (1996), Stiles & Skutch (1989), Stotz *et al.* (1996), Terborgh *et al.* (1984), Tostain *et al.* (1992), Traylor (1977), Tubelis (2000), Wetmore (1972), White (2002), Williams & Tobias (1994), Willis (1980), Wright *et al.* (1985), Zimmer (1930, 1941b).

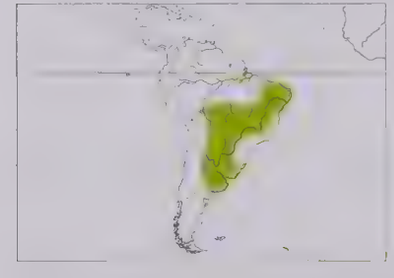
Genus *SUIRIRI* d'Orbigny, 1840

44. Suiriri Flycatcher

Suiriri suiriri

French: Tyranneau suiriri **German**: Grauscheitel-Olivtyrann **Spanish**: Fiofío Suirirí
Other common names: Chaco/Southern Suiriri Flycatcher (*suiriri*); Campo/Northern Suiriri Flycatcher (*affinis*, *bahiae*)

Taxonomy. *Muscicapa suiriri* Vieillot, 1818, Puerto Pinasco, Paraguay.
Genus traditionally placed near *Elaenia* and allies on basis of external morphology, but syringeal data suggest closest to *Ornithion* and allies. Until recently, *S. islerorum* was included as an undescribed form of present species. Races *affinis* and *bahiae* together sometimes treated as a separate species, but former intergrades broadly with nominate in Bolivia; latter suspected by some as being of hybrid origin (following secondary contact of *affinis* with a hypothetical remnant population of ancestral *suiriri* in NE Brazil). Three subspecies recognized.
Subspecies and Distribution.
S. s. affinis (Burmeister, 1856) - Surinam, E Brazil (W Pará, Amapá, and from Maranhão, W Piauí and W Bahia S to most of Mato Grosso, Goiás and São Paulo) and N Bolivia (Beni).
S. s. bahiae (Berlepsch, 1893) - NE Brazil (Paraíba, Pernambuco, NE Bahia).
S. s. suiriri (Vieillot, 1818) - E Bolivia, S Brazil, Paraguay, N & E Argentina and Uruguay.



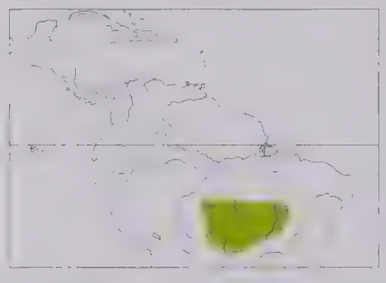
Descriptive notes. 15·5-16 cm; 11·5-16 g (nominate), 18·5-21 g (*affinis*). Nominate race is mostly grey on crown and back, small white supraloral spot and short supercilium; wings and tail darker, distinct greyish-white wingbars and edges of secondaries, rectrices with pale outer webs and conspicuous pale tips; entirely whitish below, somewhat darker on breast; iris dark brown; bill and legs black. Sexes alike. Juvenile undescribed. Race *affinis* is slightly larger and longer-billed, more olive on back, wing markings more yellowish, paler buffy-yellowish rump and base of tail, throat white, breast pale grey, lower belly and crissum pale yellow; *bahiae* is very similar to previous, but rump and tail base brownish, not pale. Voice. Paired male and female of race *affinis* give different songs in simultaneous duets, male a series of sneezy "pi-chew" notes, variable in length, typically begins with several squeaky notes and ends with several monosyllabic "chew" notes, female a series of loud, squeaky notes similar in quality to introductory notes of male song but higher in frequency and amplitude and more widely spaced, typically decelerating at end; female also gives variety of single-note contact calls that are nasal and have "whiny" quality. All known vocalizations of *bahiae* apparently homologous to nominate, and neither race well documented vocally; most common vocalization a single nasal "rowl" or "jyow".
Habitat. Chaco and open woodland; to 3000 m all year in Bolivian Andes. Race *affinis* restricted to open *cerrado* and *campo* with scattered tall shrubs ("*campo sujo*").
Food and Feeding. Arthropods; also small fruits, e.g. of *Curatella americana*. Perch-gleans items directly from leaf and branch surfaces, hover-gleaning less frequent; aerial hawking for arthropods, by sallying 1-2 m from crown of trees, also less frequent. Recorded as flying 1-3 m from tree down to ground in order to feed on arthropods, especially in recently burnt or very open areas. Less active forager than *S. islerorum*.
Breeding. Oct-Dec in Argentina. Cup-nest constructed of wool, spiderwebs and lichen, external diameter 7 cm, internal diameter 4 cm, height 4-6 cm, internal depth 2·5-3·5 cm, placed 3-6·5 m above ground in tree fork. Clutch 3 eggs; incubation and fledging periods not documented. Brood parasitism by Shiny Cowbird (*Molothrus bonariensis*) recorded.
Movements. Some post-breeding movement to lowland areas in E Bolivia. Nominate race recorded during Aug in Minas Gerais (Brazil), probably a migrant.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Occurs in numerous protected areas, including: Sipaliwini Savanna Nature Reserve, in Surinam; Noel Kempff Mercado National Park and Beni Biosphere Reserve, in Bolivia; San Luis National Park, in Paraguay; Brasília and Serra da Canastra National Parks and EMBRAPA Experimental Station, all in Brazil; and San Juan de Poriahú Private Reserve (in Iberá Provincial Reserve), in Argentina. Large-scale conversion of dry forest and grassland to agriculture is causing significant decline of habitat across Cerrado and Chaco biomes. Greatest threats are posed by conversion for eucalypt (*Eucalyptus*) and pine (*Pinus*) plantations, livestock farming, and large-scale cultivation of soybeans, rice and other exportable crops; outside protected areas few undisturbed tracts remain, and these may soon be degraded by spreading fires and overgrazing, or completely disappear through agricultural expansion. Repeated annual burning of *cerrado* during dry season threatens this habitat; nevertheless, the species has been found in *cerrado* after burning, suggesting some tolerance of frequent fires.
Bibliography. Babarskas *et al.* (2003), Brooks *et al.* (1993), Canevari *et al.* (1991), Cavalcanti (1988), Cory & Hellmayr (1927), Di Giacomo (2004), Dubs (1992), Haffer (1974), Haverschmidt & Mees (1994), Hayes (1995, 2001), Klimaitis & Moschione (1987), Lanyon (1988b), López (1997), Lowen *et al.* (1996), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Novaes (1978a), de la Peña (1987, 1988, 1996), Ridgely & Tudor (1994), Schmitt *et al.* (1997), Schubart *et al.* (1965), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1982), Wetmore (1926), Zimmer, J.T. (1955b), Zimmer, K.J. *et al.* (2001).

45. Chapada Flycatcher

Suiriri islerorum

French: Tyranneau des Isler **German**: Chapadatyrann **Spanish**: Fiofío de la Chapada

Taxonomy. *Suiriri islerorum* K. J. Zimmer *et al.*, 2001, Chapada dos Guimarães, Mato Grosso, Brazil.
Genus traditionally placed near *Elaenia* and allies on basis of external morphology, but syringeal data suggest closest to *Ornithion* and allies. This species was until recently treated as an undescribed form of *S. suiriri*; moreover, unpublished molecular data suggest that it may be more closely related to *Sublegatus* than to latter species. Monotypic.
Distribution. C & SW Brazil (Maranhão, Tocantins, Mato Grosso, Goiás, Mato Grosso do Sul) and extreme E Bolivia (E Santa Cruz).



Descriptive notes. 16 cm; 21-23 g. Crown and back are medium grey, lightly washed olive; small supraloral spot and supercilium white; wings and tail darker, distinct greyish-white wingbars and edges of secondaries, tail proportionally short and broad, feathers with pale outer webs and conspicuous whitish tips; chin, throat and breast whitish, belly and undertail-coverts pure yellow; iris brown; bill black; legs medium grey. Distinguished from similar *S. suiriri* by yellow belly and broader whitish tip to tail, from race *affinis* of that species by shorter and broader bill almost entirely black, darker dorsal surface of tail, white of throat extending up to gape, from race *bahiae* also by darker and less green back, less white breast, paler rump and uppertail-coverts. Sexes alike. Juvenile undescribed. Voice. Paired male and female give different songs in simultaneous duets, male a loud series of paired couplets, a repeated twangy "where where, whooz it", female a loud bubbly rattle of variable length and typically preceded by one or two "whur" notes. Contact call of female of 2-3 syllables, "zhuwheep" or "zhuwheep-oo".
Habitat. Typical *cerrado*, also *campo cerrado* and "*campo sujo*". Highest densities in moderately closed, shrubby areas with relatively large grass component, and with scattered trees 2-5 m tall. Confirmed elevational range 250-750 m; possibly ascends as high as 1200 m.
Food and Feeding. Small arthropods, also fruits. Forages in middle and upper branches of trees, rarely descends to shrubs or the ground. Perch-gleans prey from leaf and branch surfaces, and sallies to vegetation to hover-glean arthropods or fruit; makes occasional short aerial sallies for flying insects. More active than *S. suiriri*.
Breeding. Vocalizing males with enlarged testes and females with well-developed brood patches in late Sept; primary hatching and fledging period probably in Oct. Territorial encounters involve sex-specific duetting and unique stereotypic behaviour from tree crown or bare snag; male flicks wings, and flips tail upwards and fans it, female simultaneously flicks wings and fans tail but tail flipped downwards. No information on nest or other aspects of breeding.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare to locally fairly common. In Mato Grosso, fairly common in shrubby areas with much grass and scattered trees, e.g. along first few km of the Agua Fria road (near Chapada dos Guimarães), and less common in more wooded *cerrado*, e.g. along the Coxipo do Ouro road (near Cuiabá). Average of 1-2 pairs/km in limited roadside surveys. Occurs in Noel Kempff Mercado National Park, in Bolivia, and Chapada dos Guimarães National Park, in Brazil, both of which contain extensive areas of suitable *cerrado* habitat; in Brazil, may also be present in Serra das Araras Ecological Station (W Mato Grosso). Greatest threats to *cerrado* habitats are posed by habitat conversion for eucalypt (*Eucalyptus*) and pine (*Pinus*) plantations, livestock farming, and large-scale cultivation of soybeans, rice and other exportable crops; outside protected areas few undisturbed tracts remain, and these may soon be degraded by spreading fires and overgrazing or completely disappear due to agricultural conversion. Repeated annual burning during dry season, if it stunts shrub recovery, is also a threat. In addition, some areas of suitable habitat are at risk from urbanization, e.g. at the type locality.
Bibliography. Bates & Parker (1998), Chesser (1997), Cory & Hellmayr (1927), Davis (1993), Fjeldså & Maijer (1996), Green (2001b), Hayes (2001), Hennessey, Herzog & Sagot (2003), Miserendino (1998), Ridgely & Tudor (1994), Traylor (1982), Zimmer *et al.* (2001).

PLATE 19 ➤


46
47
48
ssp taeniopterus
ssp stictopterus
ssp roraimae
PLATE 19
inches 2
cm 5
ssp setophagoides
50
51
ssp leucophrys
49
ssp pallidior
ssp rufomarginatus
52
with blacker head
53
♂
♀
54
ssp alpinus
ssp bolivianus
55
57
ssp agraphia
59
56
ssp parulus
ssp aequatorialis
58
ssp plengei

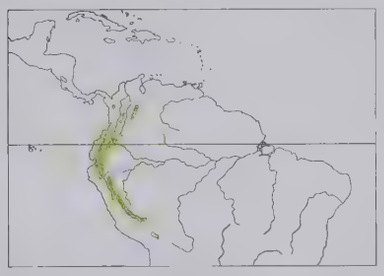
Genus *MECOCERCULUS* P. L. Sclater, 1862

46. White-tailed Tyrannulet

Mecocerculus poecilocercus

French: Tyranneau à queue blanche **Spanish**: Piojito Coliblanco
German: Weißschwanz-Tachurityrann

Taxonomy. *Serpophaga poecilocerca* P. L. Sclater and Salvin, 1873, Púellaro, 8000 feet [c. 2440 m], Pichincha, Ecuador.
Genus as presently constituted is probably polyphyletic, and in need of further study. Syringeal characters suggest that present species and *M. hellmayri*, which form a superspecies, as well as *M. stictopterus*, are possibly close to *Camptostoma*, *Inezia* and relatives. Monotypic.
Distribution. Forested Andes from N Colombia S to SE Peru (S to Cuzco and Madre de Dios).



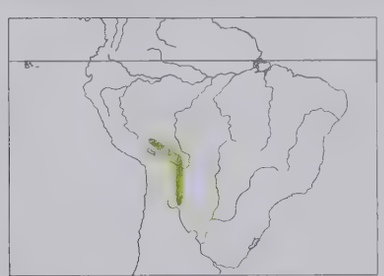
Descriptive notes. 11 cm; 10-11 g. Parulid-like tyrannulet with conspicuous white outer tail feathers. Has thin white supercilium, faint blackish eyestripe, whitish face; medium-grey crown contrasting with greenish-olive upperparts, bright greenish-yellow rump and uppertail-coverts; wings dusky, two white to pale buff wingbars, edges of flight feathers (except near base) pale yellow; tail dusky olive, outermost pair of rectrices mostly or entirely white; throat and underparts greyish-white, faintly washed darker greyish on breast and sides, belly and undertail-coverts yellowish-white; iris brown; bill thin, pointed, black; legs medium grey. Sexes alike, female slightly smaller. Juvenile undescribed. Voice. A series of 3 or 4 clear, downward-slurred notes in minor key, also a single wheezy note.
Habitat. Humid montane evergreen forest, especially mossy cloudforest; recorded at 1400-3050 m, mainly 1800-2400 m. Typically, replaces *M. stictopterus* at lower elevations.
Food and Feeding. Insects; occasionally small fruits. Forages in pairs or in groups of up to six individuals; frequently joins mixed-species flocks. Moves actively, with horizontal posture, often hopping along thinner branches in dense foliage of canopy or middle storey, or in tree-ferns, occasionally low near forest edge. Makes active warbler-like perch-gleans, only occasional upward hover-gleans; regularly fans tail (revealing white outer feathers) and lowers wings (revealing rump patch).
Breeding. Birds with gonads enlarged in Aug and Sept in Colombia. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to common. Apparently more common in Ecuador, where present in many protected areas and easily found along Mindo and Chiriboga roads, W of Quito. Occurs also in Río Abiseo National Park and Machu Picchu Historical Sanctuary, in Peru.
Bibliography. Allen (1998), Chapman (1917c, 1921), Cory & Hellmayr (1927), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1982), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Williams & Tobias (1994).

47. Buff-banded Tyrannulet

Mecocerculus hellmayri

French: Tyranneau de Hellmayr **Spanish**: Piojito de los Pinos
German: Fahlbinden-Tachurityrann

Taxonomy. *Mecocerculus hellmayri* Berlepsch, 1907, Cocapata, Cochabamba, Bolivia.
Genus as presently constituted is probably polyphyletic, and in need of further study. Syringeal characters suggest that present species and *M. poecilocercus*, which form a superspecies, as well as *M. stictopterus*, are possibly close to *Camptostoma*, *Inezia* and relatives. Monotypic.
Distribution. Andes from SE Peru (N Puno) S to NW Argentina (Jujuy).



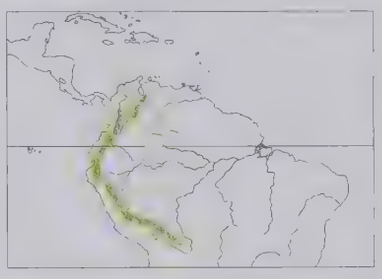
Descriptive notes. 11 cm; 10-11 g. Has thin white supercilium, faint blackish eyestripe, whitish face; medium-grey crown contrasting with greenish-olive upperparts, rump and uppertail-coverts ochraceous olive; wings dusky, two pale buff wingbars, edges of flight feathers (except near base) pale buffy yellow; tail dusky olive; throat and underparts greyish-white, faintly washed darker greyish on breast and sides, belly and undertail-coverts yellowish-white; iris brown; bill thin, pointed, black; legs medium grey. Sexes alike, female slightly smaller. Juvenile resembles adult. Voice. A series of 4 clear, whistled notes, each inflected upwards.
Habitat. Humid montane evergreen forest, especially mossy cloudforest, also *Podocarpus* forest; recorded at 800-2600 m, mainly 1400-2200 m, locally to c. 3000 m. Typically, replaces *M. stictopterus* at lower elevations.
Food and Feeding. Little known. Usually forages alone, often in mixed-species flocks. Moves actively, with horizontal posture, in outer foliage; makes parulid-like perch-gleans and upward hover-gleans.
Breeding. Juvenile in May in Bolivia. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon. Occurs in every protected area in Bolivian Yungas and S to NW Argentina (Calilegua National Park).
Bibliography. Birdsley (2002), Canevari *et al.* (1991), Chebez (1994), Cory & Hellmayr (1927), Cracraft (1985), Di Giacomo & López (2000), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Hennessey, Herzog & Sagot (2003), Lanyon (1988b), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Remsen (1984), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977).

48. White-banded Tyrannulet

Mecocerculus stictopterus

French: Tyranneau à sourcils blancs **Spanish**: Piojito Alifranjeado
German: Weißbinden-Tachurityrann

Taxonomy. *Elainia stictoptera* P. L. Sclater, 1859, Matus, Chimborazo, Ecuador.
Genus as presently constituted is probably polyphyletic, and in need of further study. Syringeal characters suggest that present species, as well as *M. poecilocercus* and *M. hellmayri*, are possibly close to *Camptostoma*, *Inezia* and relatives. Race *taeniopterus* intergrades with nominate in Peru (E La Libertad). Three subspecies recognized.
Subspecies and Distribution.
M. s. albocaudatus Phelps, Sr & Gilliard, 1941 - Andes of W Venezuela (Trujillo, Mérida, Táchira).
M. s. stictopterus (P. L. Sclater, 1859) - Andes of Colombia, Ecuador (both slopes) and N Peru (Piura, Cajamarca, Amazonas).
M. s. taeniopterus Cabanis, 1874 - E Andes of Peru (S from E La Libertad) S to N Bolivia (La Paz, Cochabamba).



Descriptive notes. 13 cm; 8-11 g. Nominate race has white supercilium, blackish eyestripe, medium-grey crown contrasting with plain dark brownish-olive upperparts; face whitish, bordered posteriorly by indistinct dusky auricular crescent; wings dark dusky, two pure white wingbars, edges of flight feathers (except near base) bright yellow to ochraceous; tail dusky olive; throat and underparts greyish-white, washed greyish on breast and sides, belly whitish, undertail-coverts pale yellow; iris brown; bill long, thin, black, lower mandible sometimes flesh-coloured at base; legs grey. Sexes similar, female on average slightly smaller. Juvenile undescribed. Races differ only slightly: *taeniopterus* has slightly lighter and greener back than nominate, lacking brownish cast, paler grey crown, paler grey wash on breast, less conspicuous ochraceous on secondaries; *albocaudatus* has outermost pair of tail feathers dull buffy white. Voice. Distinctive sharp, rising "squeeyh", sometimes in short series, occasionally interspersed with rapid trill that rises, then falls; dawn song a mix of these calls interspersed with sharper notes.
Habitat. Humid montane evergreen forest, especially mossy cloudforest, stunted elfin forest, alder (*Alnus*) thickets bordering landslides, and temperate brushland near tree-line; recorded at 1900-3600 m, mainly 2300-3300 m. Typically occurs at higher elevations than *M. hellmayri* and *M. poecilocercus*.
Food and Feeding. Insects; occasionally small fruits. Forages in pairs or in groups of 3-5 individuals; frequently joins mixed-species flocks. Forages actively, with horizontal posture, in outer foliage of canopy or middle storey of forest, occasionally low near forest edge. Makes active parulid-like flits, perch-gleans, and upward hover-gleans; regularly hangs in manner of a tit (Paridae) while perch-gleaning.
Breeding. Fledglings in Dec and birds with enlarged gonads in Jan and Aug in Colombia; gonads enlarged in Oct-Nov in SE Peru. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally common; especially common in alder stands. Occurs in many protected areas, including Sierra Nevada National Park, in Venezuela, Puracé National Park and Tambito Nature Reserve, in Colombia, all Andean protected areas in Ecuador and E Peru, and the Yungas of Bolivia.
Bibliography. Allen (1998), Baez *et al.* (1997), Chapman (1917c, 1921), Cory & Hellmayr (1927), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hennessey & Gómez (2003), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1982), Remsen (1985), Ridgely (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rodewald & Rodewald (2003), Salaman (1994), Smith (1971), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Williams & Tobias (1994), Zimmer (1930, 1940b).

49. White-throated Tyrannulet

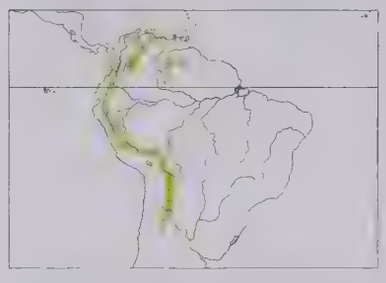
Mecocerculus leucophrys

French: Tyranneau à gorge blanche **Spanish**: Piojito Gargantilla
German: Weißkehl-Tachurityrann

Taxonomy. *M[uscicapa] leucophrys* d'Orbigny and Lafresnaye, 1837, Yanacachi, La Paz, Bolivia.
Genus as presently constituted is probably polyphyletic, and in need of further study. Present species not obviously related to any of forms currently treated as congeners. Race *pallidior* has been suggested as warranting species rank. Species exhibits dramatic "leapfrog" pattern of geographical variation: birds of small size and bearing extremely similar colour patterns occur at N & S ends of range, with much larger and more richly coloured forms in intervening cordilleras. In view of the remarkable differences existing between certain populations that occupy adjacent mountain ridges, several described taxa referring to marginally discernible intermediates are probably better merged with neighbouring forms: *montensis* (Santa Marta Mts, in Colombia) and *pallilitergum* (Venezuelan coastal mountains from Yaracuy E to Miranda) merged with *nigriceps*, and *gularis* (Sierra de Perijá and Mérida Andes, in W Venezuela) with *setophagoides*. Ten subspecies currently recognized.

On following pages: 50. Rufous-winged Tyrannulet (*Mecocerculus calopterus*); 51. Sulphur-bellied Tyrannulet (*Mecocerculus minor*); 52. Black-crested Tit-tyrant (*Anairetes nigrocristatus*); 53. Pied-crested Tit-tyrant (*Anairetes reguloides*); 54. Ash-breasted Tit-tyrant (*Anairetes alpinus*); 55. Yellow-billed Tit-tyrant (*Anairetes flavirostris*); 56. Tufted Tit-tyrant (*Anairetes parulus*); 57. Juan Fernandez Tit-tyrant (*Anairetes fernandezianus*); 58. Agile Tit-tyrant (*Anairetes agilis*); 59. Unstreaked Tit-tyrant (*Anairetes agraphia*).

Subspecies and Distribution.
M. l. notatus Todd, 1919 - W & C Andes of Colombia (S to Cauca).
M. l. setophagoides (Bonaparte, 1845) - E Andes of NW Venezuela (W Zulia and Táchira E to S Lara) and Colombia (Norte de Santander S to Cundinamarca).
M. l. nigriceps Chapman, 1899 - mountains of N Colombia (in Santa Marta region) and N Venezuela (Yaracuy E to Sucre and Monagas).
M. l. roraimae Hellmayr, 1921 - tepui zone of Amazonas (except Cerro Parú and Cerro Duida) and Bolívar, in S & SE Venezuela; also adjacent parts of N Brazil and W Guyana.
M. l. parui Phelps, Sr & Phelps, Jr, 1950 - Cerro Parú, in NC Amazonas (Venezuela).
M. l. chapmani Dickerman, 1985 - Cerro Duida, in C Amazonas (Venezuela).
M. l. rufomarginatus (Lawrence, 1869) - Andes of S Colombia (Nariño), Ecuador and NW Peru (Piura).
M. l. pallidior Carriker, 1933 - W Andes of Peru (Ancash).
M. l. brunneomarginatus Chapman, 1924 - E Andes of Peru (S to Cuzco).
M. l. leucophrys (d'Orbigny & Lafresnaye, 1837) - E Andes from S Peru (S from Cuzco and Madre de Dios) S to N Argentina (Salta, Tucumán).



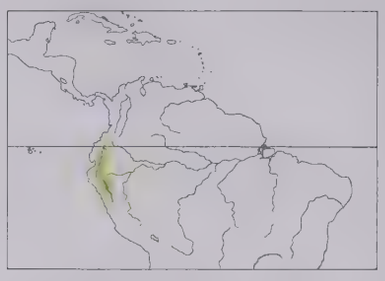
Descriptive notes. 11-14 cm. Nominate race is medium olive-grey above, darker on crown; pure white lores and thin supercilium, dusky face, auriculars with some white feathers; wings brownish-black, two conspicuous broad wingbars medium to dark cinnamon-buff, edges of flight-feathers (except dark basal band) and tips of tertials cinnamon-buff to yellowish-buff; tail dusky brown; throat white, extending to behind auriculars, grey breastband narrow centrally and broad laterally (creating "vest"), rest of underparts medium yellow; iris dark brown; bill long and black; legs black. Sexes alike. Juvenile not described. Race *setophagoides* is larger than nominate, more brownish-grey above, wingbars paler cinammon to creamy buff, belly paler, creamy yellow; *notatus* is like previous but larger, tail longer, upperparts more brownish, wingbars and edges of remiges rich cinnamon-buff, breastband slightly browner; *nigriceps* is much smaller, upperparts strongly tinged olive, crown almost same colour as back, wingbars and edges of remiges nearly white; *roraimae* is also small, much darker above, especially on crown, wingbars more ochraceous; *parui* differs from previous in having upperparts darker brownish, less greyish-olive; *chapmani* has belly richer yellow than last, distinct olive breastband; *rufomarginatus* is significantly warmer, richer brown above, dark sepia-brown crown, wingbars and edges of remiges rich rufous, breastband and upper flanks washed warm brown; *brunneomarginatus* resembles previous, but wingbars and edges of remiges slightly paler rufous, belly much brighter yellow (as yellow as nominate); *pallidior* is paler, more greyish-brown, less olive throughout. Voice. Typical note a singe "pit"; dawn song a musical, warbling series, "whichiry-wichiry-wichiry-chew".
Habitat. Humid upper montane forest and forest edge, stunted cloudforest, elfin forest, brushy ravines at tree-line, shrubby clearings and pastures, *Polylepis* woodland; 1300-4400 m, mainly above 2500 m.
Food and Feeding. Diet predominantly insects and spiders, occasionally small fruits. Forages singly or in pairs, often alone; also regularly joins mixed-species flocks, including small groups containing Giant Conebill (*Oreomanes fraseri*) and Tawny Tit-spinetail (*Leptasthenura yanacensis*) in *Polylepis* woodland. Forages with upright posture, making pauses of 10-30 seconds on open perches 1-4 m from ground, usually under or alongside open vegetation, with tail held nearly vertical (unlike other members of genus); often clings to vertical stems to examine nearby foliage for prey. Sometimes wags tail from side to side. Home range c. 3 ha.
Breeding. Fledglings in Mar and birds with enlarged gonads in Jan-Aug in Colombia; fledglings in Aug-Sept in Ecuador; nests in Dec-Mar in Argentina. Nest a neat cup containing abundant plant fibres, woolly material, moss and spiderwebs, external diameter 7 cm, internal 4 cm, depth 4·5 cm, placed 1·5-4 m above ground on horizontal tree branch, sometimes amid *Tillandsia* clump. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Resident. Apparently some elevational movement during austral winter.
Status and Conservation. Not globally threatened. Uncommon to very common. Widespread; can be found in any protected area within appropriate elevational zone in its range, although most common in S.
Bibliography. Alabarce & Antelo (1993), Birdsley (2002), Chapman (1917c, 1931), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Dickerman (1985), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Gilliard (1941), Herzog *et al.* (2002), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Mayr & Phelps (1967), Meyer de Schauensee (1982), Moynihan (1979), Narosky & Salvador (1998), de la Peña (1988), Remsen (1985), Ridgely (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rodewald & Rodewald (2003), Salaman (1994), Schulenberg & Servat (2001), Sick (1993, 1997), Smith (1971), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Wetmore (1926), Willard *et al.* (1991), Williams & Tobias (1994), Zimmer (1930, 1940b).

50. **Rufous-winged Tyrannulet**

Mecocerculus calopterus

French: Tyranneau à ailes rousses **Spanish**: Piojito Alirrufo
German: Rotschwingen-Tachurityrann

Taxonomy. *Formicivora caloptera* P. L. Sclater, 1859, Pallatanga, Chimborazo, Ecuador.
Genus as presently constituted is probably polyphyletic, and in need of further study. Syringeal characters suggest that present species and *M. minor* are possibly related to *Phyllomyias*, specifically to *Tyranniscus* if latter resurrected. Monotypic.
Distribution. Andes of W & SE Ecuador and N Peru (S to Lambayeque and La Libertad).
Descriptive notes. 11 cm; 10-11 g. Small parulid-like tyrannulet with rufous on flight-feathers. Has conspicuous white supercilium, broad black line through eye and auriculars, whitish lower face bordered posteriorly by blackish auricular crescent; dark grey crown, contrasting bright greenish-olive upperparts; wings dark dusky, two pure white wingbars, bright rufous edges of flight-feathers (except near base), edges of innermost and outermost remiges yellow; tail dusky olive, with white on two outer pairs; throat and breast pale greyish-white, belly whitish, undertail-coverts pale yellow; iris brown; bill long, thin, black; legs grey. Sexes alike. Juvenile undescribed. Voice. Husky 2-note call, "pur-chee", sometimes with additional notes, "pur-chee, chi-chi-chu", also fast, descending series of emphatic notes, "kew-ki-ke-ke-ku-ku".
Habitat. Humid montane forest, deciduous forest, clearings with scattered trees, and plantations; 400-1950 m, mainly 800-1500 m, occasionally down to 200 m.



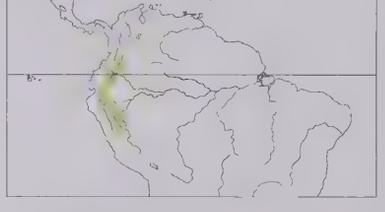
Food and Feeding. Insects. Forages alone or in pairs, often with mixed-species flocks. Behaviour like that of parulid warbler, actively flits through outer foliage of small-leafed canopy trees; insects taken mainly with perch-gleans and short hover-gleans.
Breeding. No information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Rare to uncommon; apparently more numerous on W Andean slopes than on E ones. In Ecuador, occurs in Macquipucuna Reserve, Río Palenque Science Centre and Tinalandia Private Reserve (all in Pichincha), Machalilla National Park (Manabí), Cerro Blanco Forest Reserve and Loma Alta Ecological Reserve (Guayas), Manta Real (Azuay), and Tundo Nature Reserve (in Sozoranga region). Occurs also in Northwest Peru Biosphere Reserve, in Peru.
Bibliography. Carrión & Sibley (1992), Cory & Hellmayr (1927), Davies *et al.* (1994), Lanyon (1988b), Meyer de Schauensee (1982), Parker & Parker (1982), Ridgely (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977), Williams & Tobias (1994).

51. **Sulphur-bellied Tyrannulet**

Mecocerculus minor

French: Tyranneau soufré **German**: Gelbbauch-Tachurityrann **Spanish**: Piojito Azufre

Taxonomy. *Leptopogon minor* Taczanowski, 1879, Tambillo, Cajamarca, Peru.
Genus as presently constituted is probably polyphyletic, and in need of further study. Syringeal characters suggest that present species and *M. calopterus* are possibly related to *Phyllomyias*, specifically to *Tyranniscus* if latter resurrected. Monotypic.
Distribution. Andes of W Venezuela (Táchira), and locally in E range in Colombia, E Ecuador (one record from W slope) and N Peru (S to Huánuco).



Descriptive notes. 11·5-12 cm; 11 g. Parulid-like tyrannulet with bright yellow belly. Has thin white supercilium, blackish line through eye, greyish-white face fading to yellowish posteriorly and below; medium-grey crown, contrasting dark olive upperparts; wings dark dusky, two broad buffy wingbars, broad buff edges of flight-feathers (except near base); tail dusky olive, edges of rectrices tinged buffy; upper throat white, otherwise deep yellow below, breast washed with darker olive, belly and undertail-coverts bright yellow; iris brown; bill thin, pointed, black, lower mandible pale at base; legs medium grey. Sexes alike. Juvenile resembles adult. Voice. A series of weak, somewhat nasal, descending notes, "week-week-week-week" or "chew-chew-chew-chew", lasting c. 1 second, sometimes ending with slightly ascending note after a pause; also sharp "weedup" or "weeka" of similar nasal quality.
Habitat. Humid montane forest, especially second growth and broken, patchy cloudforest, clearings with scattered trees; perhaps prefers younger trees. Mainly at 1600-2700 m.
Food and Feeding. Insects; occasionally small fruits. Frequently joins mixed-species flocks. Forages actively, with horizontal posture, in outer foliage; makes frequent parulid-like flits, perch-gleans and hover-gleans.
Breeding. Juveniles in Jul in Ecuador and Aug-Nov in N Peru. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare to locally fairly common, perhaps often overlooked; possibly becomes more numerous to S. Seems to favour edge habitats; may be expanding range and becoming more common as a consequence of forest clearance by humans. Occurs in Cueva de los Guácharos National Park, in Colombia, and in all E Andean protected areas in Ecuador and S to Río Abiseo National Park, in Peru.
Bibliography. Birdsley (2002), Cory & Hellmayr (1927), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Krabbe (1992), Lanyon (1988b), Meyer de Schauensee (1982), Ridgely (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996), Traylor (1977).

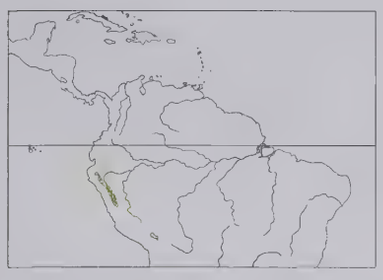
Genus *ANAIRETES* Reichenbach, 1850

52. **Black-crested Tit-tyrant**

Anairetes nigrocristatus

French: Taurillon à cimier noir **Spanish**: Cachudito Crestinegro
German: Schwarzhauben-Tachurityrann
Other common names: Maranon Tit-tyrant

Taxonomy. *Anaeretes nigrocristatus* Taczanowski, 1884, Chota, Peru.
Genus was long known as *Spizitornis*. Present species forms a superspecies with *A. reguloides*, and the two are often treated as conspecific. Monotypic.
Distribution. Extreme S Ecuador (S Loja) and N Peru (Cajamarca S to E Ancash and Huánuco).
Descriptive notes. 13 cm. Largest and most boldly marked tit-tyrant. Male has central crown feathers greatly elongated into thin, bifurcated crest overlying extensive white crown and nape patch; forehead, entire face and chin black; upperparts black, narrowly streaked white; wings black, wing-coverts broadly tipped white (two bold wingbars), secondaries boldly edged white except at base, white broadest on innermost remiges; tail feathers black, broadly tipped white, white broadest (11-18 mm) on outermost pair, which also has outer web white; throat, breast and flanks streaked black and white, belly and undertail-coverts yellowish-white; iris dark brown; bill bright orange, tip blackish; legs black. Female is similar to male, but crest shorter, front of head duskier black, remaining black-and-white pattern muted into dusky and whitish, bill mainly



black, yellow-orange only at base of lower mandible. Juvenile has crest even shorter, crown dusky, back diffusely streaked blackish and pale olivaceous, buffy lores and partial eyering, underparts dirty white, obscurely streaked dark brown across breast, bill dark with flesh-coloured base of lower mandible. Voice. An explosive, rapid trill, "wheek-tititititititititititit", lasting c. 3 seconds, also shorter version, "wheek-tic tititiit".

Habitat. Arid montane scrub, *Polylepis* woodland, and dense shrubbery bordering streams and ravines; 2300-4200 m, locally down to 2000 m.

Food and Feeding. Insects. Forages alone or in small groups; occasionally follows mixed-species flocks, including those containing *A. parulus*. Active, with frequent short flights from stem to stem near tops of dense to semi-open brush, pausing with horizontal to vertical posture, occasionally flicking tail upwards. Prey captured with perch-gleans, short sallies to hover-glean from leaves and twigs; rarely, in aerial sallies.

Breeding. Season apparently Jun-Jul. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Rare to common, and local. Common in many areas in Peru, e.g. in Calipuy and Huascarán National Parks. Usually less common than *A. parulus* where the two overlap in range.

Bibliography. Best *et al.* (1993), Cory & Hellmayr (1927), Fjeldså (1988), Fjeldså & Krabbe (1990), Lanyon (1988b), Parker *et al.* (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Roy *et al.* (1999), Stotz *et al.* (1996), Traylor (1977), Zimmer (1930, 1940b).

53. Pied-crested Tit-tyrant

Anairetes reguloides

French: Taurillon roitelet **Spanish**: Cachudito Crestiblanco
German: Streifenbauch-Tachurityrann

Taxonomy. *C[ulicivora] reguloides* d'Orbigny and Lafresnaye, 1837, Tacna, Peru.
Genus was long known as *Spizitornis*. Present species forms a superspecies with *A. nigrocristatus*, and often treated as conspecific. Two subspecies recognized.

Subspecies and Distribution.
A. r. albiventris (Chapman, 1924) - WC Peru (Ancash S to Ica and W Ayacucho; single specimen from Apurimac).
A. r. reguloides (d'Orbigny & Lafresnaye, 1837) - SW Peru (S Ayacucho S to Tacna) and extreme NW Chile (Arica).



Descriptive notes. 11·5 cm. Male nominate race has black crown, a few central crown feathers mainly white, many greatly elongated into thin, bifurcated crest overlying extensive white patch on crown and nape; forehead, entire face and chin black; upperparts boldly streaked black and white; wings black, wing-coverts broadly tipped white (two bold wingbars), secondaries boldly edged white except at base, white broadest on innermost remiges; tail black, outer web of outermost pair of rectrices and tip of remaining rectrices white; throat black with fine white streaks (sometimes lacking, perhaps in older males), breast coarsely streaked black and white, streaks stopping abruptly at lower breast but extending somewhat farther down on flanks; belly and undertail-coverts white, tinged pale yellow in fresh plumage; iris dark brown; upper mandible mainly black, lower mandible yellow to orange with blackish tip; legs black. Female is similar to male but crest shorter, forehead, face and throat with fine white streaks or mottling, white crescent under eye, black stripes on back more greyish. Juvenile has crest even shorter, buffy crown patch, dark brown back streaked buffy, buffy lores and partial eyering, underparts light buff, only faint fuscous streaks on breast. Race *albiventris* is difficult to distinguish from nominate, but in fresh plumage has longer crest, broader white crown patch, whiter belly and broader white tips of outer rectrices. Voice. Loud, descending chatter, sometimes preceded by introductory notes, "eek-éék-trrrrrrr"; also descending series of loud whistles.

Habitat. Riparian thickets, arid and semi-arid montane scrub, hedgerows in cultivated areas, shrubby hillsides; sea-level to 3500 m, mostly below 3000 m.

Food and Feeding. Insects. Forages alone or in small groups; occasionally follows mixed-species flocks in company with *A. flavirostris*. Very active, with frequent short flights from stem to stem near tops of dense to semi-open brush, making brief pauses to peer at foliage with horizontal to vertical posture, occasionally drooping wings and flicking tail upwards. Prey captured with perch-gleans, short sallies to hover-glean from leaves and twigs; rarely, aerial sallies.

Breeding. Season Nov-Mar suggested by records of birds with enlarged gonads and of juveniles. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to fairly common. Occurs in Pampa Galeras National Park, in Ayacucho (Peru).

Bibliography. Araya & Chester (1993), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Jaramillo (2003), Johnson (1967), Koepcke (1970), Lanyon (1988b), Marín (2004), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Roy *et al.* (1999), Smith (1971), Stotz *et al.* (1996), Traylor (1977), Zimmer (1930, 1940b).

54. Ash-breasted Tit-tyrant

Anairetes alpinus

French: Taurillon gris **German**: Graubrust-Tachurityrann **Spanish**: Cachudito Pechicenizo

Taxonomy. *Yanacea alpina* Carriker, 1933, Yánac, 15,000 feet [c. 4570 m], Ancash, Peru.
Genus was long known as *Spizitornis*. Present species formerly treated in monotypic genus *Yanacea*, but plumage and molecular evidence suggest close relationship with *A. flavirostris*. Two subspecies recognized.

Subspecies and Distribution.
A. a. alpinus (Carriker, 1933) - W Andean slope in N Peru (Ancash, La Libertad).
A. a. bolivianus (Carriker, 1935) - SE Peru (Cuzco, Apurímac) and NW Bolivia (La Paz).



Descriptive notes. 13 cm; 9-10 g. Nominate race has black central crown feathers greatly elongated into thin, bifurcated crest, large semi-concealed crown patch pure white, forehead and face grey; upperparts dark ashy grey, broadly but diffusely streaked blackish on back; wings black, wing-coverts broadly tipped white (two conspicuous wingbars), secondaries broadly edged white to yellowish-white except at base, innermost remiges broadly edged and tipped white; tail black, outer two pairs of rectrices mostly white; throat and breast grey, fading to yellowish-white on central belly and undertail-coverts; iris hazel to dark brown; bill black, lower mandible sometimes yellow near base, mouth-lining bright yellow or orange; legs and feet black. Sexes alike, female slightly smaller. Juvenile is duller than adult, with shorter crest. Race *bolivianus* has more extensive black on crown, whiter central belly. Voice. Mostly silent; occasionally a whining "eeeh".

Habitat. Semi-humid *Polylepis-Gynoxys* woodland, at 3700-4600 m.

Food and Feeding. Diet not recorded. Forages alone or in pairs; active, making short sallies to hover-glean or perch-glean near tops and outer edges of *Polylepis* shrubs and trees.

Breeding. Juveniles in Mar and Jul in Peru (Cuzco). No other information.

Movements. Resident.

Status and Conservation. ENDANGERED. Restricted-range species: present in Peruvian High Andes EBA and High Andes of Bolivia and Argentina EBA. Rare and very local. Recorded from about twelve mostly unprotected sites in Peru and NW Bolivia. Range severely fragmented; global population thought to number only a few hundred individuals, and each subpopulation extremely small. Usually occurs at very low densities of only 1 pair or family group per *Polylepis* grove. *Polylepis* woodland continues to suffer from cattle grazing, and in many places deliberately set grass fires restrict forest to steep, rocky areas; nevertheless, this species may be able to survive in extremely small habitat patches. Nominate race is very rare in the 3400-km² Huascarán National Park, in Ancash, and small numbers have also been found within Río Abiseo National Park, in La Libertad. In SE Peru, extent of *Polylepis* woodland in Cuzco halved during 1980s, but S race *bolivianus* is still comparatively common in good habitat patches in the Vilcabamba and Vilcanota cordilleras, and total of c. 20-30 individuals exist in several small and widely separated *Polylepis* woodlands of up to 15 ha at Abra Málaga, with small numbers also in isolated forest patches in Machu Picchu Historical Sanctuary (in and near Salcantay massif); relatively common in the Runtacocha highland, Apurímac, where *Polylepis* woodland is mature. Conservation projects and public-awareness campaigns have recently accomplished a slowdown in exploitation of woodland at Abra Málaga. In Bolivia, was found in 1993 and 1996 in several unprotected *Polylepis* groves of less than 100 m² in Choquetanga Valley, on the La Paz-Coroico road; in 1999, discovered also in nearby Cotopata National Park, in small forest patches in three small valleys where very steep slopes have so far been spared from cattle grazing; a BP-sponsored project is now helping to finance further fieldwork and public-awareness campaigns in these areas. These examples illustrate that main threats are heavy grazing and the uncontrolled use of fire, which combine to prevent *Polylepis* regeneration, especially where cutting for timber, firewood and charcoal occurs; changes in stock-rearing, from camelid to sheep and cattle, as well as erosion and soil degradation caused by agricultural intensification, are further adverse factors. This species' conservation status may soon have to be upgraded to Critical, because its small and fragmented population continues to be subject to rapid habitat destruction. Urgent priority is to encourage local people to develop land-use management and restoration schemes that separate agricultural, grazing and forest areas.

Bibliography. Carriker (1933, 1935), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Cracraft (1985), Engblom *et al.* (2002), Fjeldså (1988), Fjeldså & Kessler (1996), Fjeldså & Krabbe (1990), Kessler & Herzog (1998), Lanyon (1988b), Maynard & Waterton (1998), Meyer de Schauensee (1982), Parker & O'Neill (1980), Pulido (1991), Ridgely & Tudor (1994), Smith (1971), Stattersfield & Capper (2000), Stotz *et al.* (1996), Traylor (1977), Vogel & Hennessey (2002), Walker (2001), Wege & Long (1995), Zimmer (1940b).

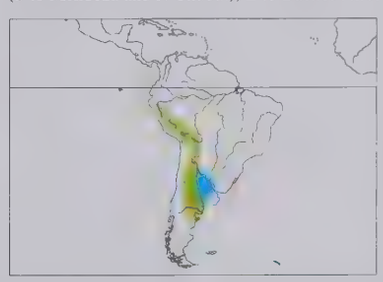
55. Yellow-billed Tit-tyrant

Anairetes flavirostris

French: Taurillon à bec jaune **Spanish**: Cachudito Piquiamarillo
German: Gelbschnabel-Tachurityrann

Taxonomy. *Anaeretes flavirostris* P. L. Sclater and Salvin, 1876, Tilotilo, Yungas of La Paz, Bolivia.
Genus was long known as *Spizitornis*. Plumage and molecular evidence suggest that present species is closely related to *A. alpinus*. Four subspecies recognized.

Subspecies and Distribution.
A. f. huancabambae (Chapman, 1924) - N Peru (Piura, Cajamarca, E La Libertad, Huánuco).
A. f. arequipae (Chapman, 1926) - SW Peru (S from Lima) S to NW Chile (Arica, Tarapacá).
A. f. cuzcoensis (Chapman, 1924) - SE Peru (Cuzco).
A. f. flavirostris P. L. Sclater & Salvin, 1876 - breeds in high Andes of Bolivia and in W Argentina (S to Mendoza and N Chubut); E to Buenos Aires and Entre Ríos in non-breeding season.



Descriptive notes. 10 cm; 6-7 g. Nominate race has forecrown feathers black and greatly elongated into thin, bifurcated crest overlying large, pure white crown patch; forehead and face dusky grey, faintly streaked white, narrow white supercilium; upperparts medium grey-brown, faintly streaked blackish; wings blackish, wing-coverts broadly tipped cinnamon-buff (two conspicuous wingbars), secondaries broadly edged cinnamon-buff except at base, innermost remiges broadly edged and tipped buffy white; tail dusky brownish, outer web of outermost feather pair and tips of remaining pairs paler; head side, throat and breast white, boldly streaked black, streaks becoming broader on lower breast and upper belly; flanks, lower belly and undertail-coverts unstreaked yellowish; iris dark brown; bill black at tip, yellow on

basal half or two-thirds, mouth-lining orange; legs slate-grey to black. Sexes alike, female slightly smaller. Juvenile is duller and more buffy than adult, with shorter crest. Race *huancabambae* has dark brown back strongly striped blackish, more extensive white in crown, and outer web and tip of outermost rectrices pure white; *cuzcoensis* is larger than other races, with darker brown and more strongly striped back, more heavily and broadly striped breast, least extensive white in crown; *arequipae* has outer web and tip of inner web of outer rectrices dull brownish, only slightly paler than rest of tail, and somewhat less yellowish on belly. Voice. Not especially vocal; a series of piercing notes accented near start, "seet, zwee-ee-seeta-seeta-seeta", and short, descending trill, "tititirrrr", also loud "keer" apparently as alarm.

Habitat. Arid montane scrub, desert scrub, thorn-scrub grassland, semi-arid brush, and semi-humid *Polylepis-Gynoxys* woodland. Mainly 1000-3700 m, occasionally to 4000 m, but recorded down to sea-level in W Peru in non-breeding season.

Food and Feeding. Insects; grass seeds occasionally eaten. Forages alone or in small groups; occasionally with mixed-species flocks, including other species of genus. Very active, with frequent short flights from stem to stem near tops of dense to semi-open brush, making brief pauses to peer at foliage with horizontal to vertical posture, holding wings somewhat drooped, occasionally flicking tail upwards to nearly vertical or over back, and crest raised vertically. Prey captured with perch-gleans, short sallies to hover-glean from leaves and twigs, and, rarely, aerial sallies.

Breeding. Oct-Jan in Argentina; egg in oviduct in Jan, gonads enlarged in Jan-Feb and juveniles seen in Feb in Bolivia. Nest a neat, shallow cup made of plant fibres, thistle down and lichens, lined with feathers, external diameter 4·7 cm, internal 3·5 cm, depth 4·9 cm, placed 1-2 m above ground inside shrubbery. Clutch 2-3 eggs; incubation at one nest at least 13 days; fledging period not documented.

Movements. Populations breeding in extreme S of range apparently migrate N, spending non-breeding season in N & C Argentina (N to Jujuy and Entre Ríos, occasionally E to Buenos Aires); S Andean populations may descend to sea-level in austral winter.

Status and Conservation. Not globally threatened. Fairly common to common. Boundary between breeding and non-breeding ranges in Argentina not clear; further fieldwork required.

Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Fjeldså & Krabbe (1990), Flores & Capriles (1998), Johnson (1967), Joseph (1996), Koepcke (1970), Lanyon (1988b), Meyer de Schauensee (1982), Mezquida (2002), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Nellar (1993), Nores *et al.* (1983), de la Peña (1988, 1997, 2001a, 2001b), Ridgely & Tudor (1994), Rocha & Peñaranda (1995), Rocha & Quiroga (1998), Roy *et al.* (1999), Smith (1971), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Wetmore (1926), Zimmer (1930, 1940b).

56. **Tufted Tit-tyrant**

Anairetes parulus

French: Taurillon mésange **German**: Meisentachurityrann **Spanish**: Cachudito Piquinegro

Taxonomy. *Muscicapa Parulus* Kittlitz, 1830, Valparaíso, Chile.

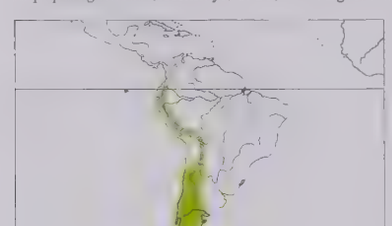
Genus was long known as *Spizitornis*. Molecular data indicate that this species and *A. fernandezianus* form a superspecies. Three subspecies recognized.

Subspecies and Distribution.

A. p. aequatorialis Berlepsch & Taczanowski, 1884 - Andes from S Colombia S to W Bolivia and N Argentina (S to Salta and Jujuy).

A. p. parulus (Kittlitz, 1830) - W Chile (from Atacama) and SW Argentina (from W Neuquén) S to Tierra del Fuego.

A. p. patagonicus (Hellmayr, 1920) - W Argentina (S Mendoza S to N Santa Cruz).



Descriptive notes. 9·5 cm; 6 g. Nominate race has blackish crown, central feathers pure black and greatly elongated into thin, recurved crest, concealed small white crown patch (sometimes absent); forehead dark grey, lores black, curved supraloral patch and rear supercilium white; upperparts dark grey; wings blackish, wing-coverts narrowly tipped white (two thin, rather indistinct wingbars), secondaries faintly edged white to pale yellow, pale colour broadest on innermost remiges; tail dusky, outer web of outermost feather pair and tips of remaining pairs whitish; head side, throat and breast white, finely but boldly streaked dark grey to black, streaks becoming thinner on lower breast and upper belly and extending down flanks; lower breast becoming yellowish, belly and undertail-coverts medium yellow; iris creamy white to pale yellow; bill black; legs black. Sexes alike, female slightly smaller. Juvenile is duller, with shorter crest, no white in crown, slightly buffy wingbars. Races vary only slightly, and all appear much yellower below in fresh plumage than when plumage worn: *aequatorialis* is somewhat browner above, wingbars better defined, breast streaks broader and more extensive; *patagonicus* is more distinctive, paler grey overall, crown greyer, white wingbars broader and more distinct, breast streaks broader and more extensive, underparts paler yellow to whitish. Voice. Very vocal; sharp, high-pitched trills, chatters, and irregular phrases, sometimes in duet, most commonly a series of "chuit" notes speeding up into rapid, chattery, slightly descending trill; contact note a thin "pluit-pluit".

Habitat. Broader ecological range than all congeners. Favours montane shrublands, but also occurs in brushy forest with *Chusquea* bamboo, elfin forest, cloudforest edges, disturbed humid scrub, *Polylepis* woodland, temperate forest, and dry thorn-scrub. Mostly 1800-3500, but to 4200 m in C Andes; sea-level to 2000 m in Chile.

Food and Feeding. Insects. Forages very actively, in pairs or family groups, occasionally with mixed-species flocks but more often not. Makes frequent short flights from perch to perch, preferring small-leafed shrubs; perch-gleans and hover-gleans from vegetation, including flowers and twigs, and occasionally sallies into air. Appears nervous while foraging, often flicking tail upwards and shivering wings, frequently pivoting on perch.

Breeding. Jan-Jun in N and Aug-Jan in S; regularly double-brooded. Often aggressive, chasing with undulating flights while making whirring, rattling sound. Nest a small, compactly built open cup made of root fibres, grass, lichens and thistle down, lined with abundant small feathers, placed in shrub or bamboo, often bordering path, stream or clearing. Clutch mainly 2-3 eggs; incubation and fledging periods not documented.

Movements. S populations (*patagonicus*) migrate N to N Argentina (Salta) after breeding.

Status and Conservation. Not globally threatened. Uncommon to locally common. Occurs in several protected areas, e.g. Puracé National Park, in Colombia, Cotopaxi National Park and Guandera Biological Reserve, both in Ecuador, Machu Picchu Historical Sanctuary, in Peru, and La Campana National Park, in Chile.

Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chapman (1921), Clark (1986), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Crawshay (1907), Fitzpatrick (1980c), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Flores & Capriles (1998), Harris (1998), Herzog *et al.* (2002), Hilty & Brown (1986), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967), Joseph (1996), Lanyon (1988b), Meyer de Schauensee (1982), Narosky & Salvador (1998), Navas & Bó (1991), Nores *et al.* (1983), de la Peña (1987, 1988), Quiroga *et al.* (1998), Remsen (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Roy *et al.* (1999), Smith (1971), Stotz *et al.* (1996), Traylor (1977), Valenzuela (1962), Vuilleumier (1985), Wetmore (1926), Williams & Tobias (1994), Zimmer (1930, 1940b).

57. **Juan Fernandez Tit-tyrant**

Anairetes fernandezianus

French: Taurillon de Juan Fernandez **Spanish**: Cachudito de Juan Fernández
German: Juan-Fernandez-Tachurityrann
Other common names: Masatierra Tit-tyrant

Taxonomy. *Culicivora fernandeziana* R. A. Philippi [Krumwiede], 1857, Juan Fernández Islands, off Chile. Genus was long known as *Spizitornis*. Molecular data indicate that this species and *A. parulus* form a superspecies. Monotypic.

Distribution. Robinson Crusoe I (formerly Más Atierra), in Juan Fernández Is (off Chile).



Descriptive notes. 12·5 cm. A large, dark version of *A. parulus*. Crown is blackish, with central feathers pure black and greatly elongated into very substantial recurved crest overlying a few whitish feathers; forehead and lores black, small supraloral patch and thin rear supercilium white; upperparts dark, dusky grey; wings blackish, wing-coverts narrowly tipped white (two wingbars), secondaries faintly edged white to pale yellow, pale colour broadest on innermost remiges; tail dusky, outer web of outermost feather pair and tips of remaining ones whitish; head side, throat and breast white, boldly streaked black, streaks broadest on breast and upper belly and extending down flanks; lower breast, belly and undertail-coverts creamy white; iris pale yellow; bill black; legs black. Sexes alike, female slightly smaller and with smaller crest. Juvenile undescribed. Voice. Not described; likely to be similar to that of *A. parulus*.

Habitat. All wooded and scrub habitats, including second growth and gardens; sea-level to 900 m.

Food and Feeding. Diet probably insects. Forages actively, in pairs or family groups. Makes frequent short flights from perch to perch; perch-gleans and hover-gleans from vegetation, flowers and twigs, and occasionally sallies into air.

Breeding. Not documented; probably Aug-Dec.

Movements. Resident.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Juan Fernández Islands EBA. Population estimated at 5000 individuals in mid-1980s, and apparently stable. The only insectivorous bird species on the island. Common in undisturbed native woodland, also in luma (*Nothomyrica fernandeziana*) parkland even where understorey has been demolished by introduced mammals such as cattle, pigs, goats and sheep; also in eucalypt (*Eucalyptus*) woodland, and sometimes among other exotic vegetation. Probably suffers some losses from introduced predators such as coatis (*Nasua*), rats (*Rattus*) and cats. Juan Fernández Is were designated as a biosphere reserve in 1977, and Chilean government began a habitat-restoration programme in 1997; the islands have been nominated for World Heritage listing.

Bibliography. Araya & Chester (1993), Brooke (1987), Cory & Hellmayr (1927), Jaramillo (2003), Johnson (1967), Lanyon (1988b), Marín (2004), Ridgely & Tudor (1994), Smith (1971), Stattersfield & Capper (2000), Stotz *et al.* (1996), Traylor (1977), Vuilleumier (1985), Zimmer (1940b).

58. **Agile Tit-tyrant**

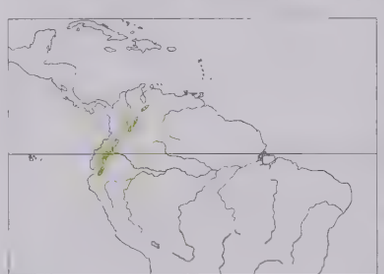
Anairetes agilis

French: Taurillon agile **German**: Brauentachurityrann **Spanish**: Cachudito Ágil

Taxonomy. *Euscarthmus agilis* P. L. Sclater, 1856, "Bogotá", Colombia.

Genus was long known as *Spizitornis*. This species and closely related *A. agraphia* often placed together in a separate genus, *Uromyias*, recognizable on basis of syringeal and plumage characters, but molecular evidence indicates that they are imbedded within present genus. Monotypic.

Distribution. Andes of W Venezuela (Mérida, Táchira), E & C ranges of Colombia, and N Ecuador (S to Cotopaxi on W slope, to N Loja on E slope).



Descriptive notes. 12·5 cm. Streaked flycatcher with flattened black crest and very long, graduated tail. Has brownish-black crown, feathers elongated into bushy, flattened crest, bordered entirely below by white supercilium also consisting of elongated feathers; lores black, broad eyestripe dark brown, face finely streaked black and white; upperparts warm brown, heavily streaked black; wings dark, dusky brown, innermost remiges narrowly edged whitish; tail dusky, outermost rectrices edged white; throat whitish, finely streaked black, underparts pale yellow, heavily but finely streaked blackish except on lower belly and undertail-coverts; iris dark brown; bill black, lower mandible yellow at base; legs dark grey. Sexes alike, female slightly smaller. Juvenile has two buffy wingbars. Voice. A short, chattery trill, sometimes descending slightly and ending in hiccup, "t-t-t-t-t-t-t-t-e-e-e-spew-it!", also single soft chip, and sharp "speew-it!".

Habitat. Upper montane cloudforest and shrubby elfin-forest thickets, with strong preference for mixed or pure stands of *Chusquea* bamboo; 1800-3400 m, mainly above 2700 m.

Food and Feeding. Insects. Forages actively, in pairs or in groups of up to six individuals, almost always with mixed-species flocks, within several metres of ground. Feeds by perch-gleaning and rapid upward strikes; some acrobatic manoeuvres on thin twigs.

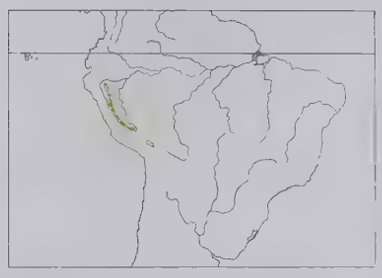
Breeding. Birds with enlarged gonads in Feb in Colombia, and fledglings in Dec and Jul in NW Ecuador. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to common. Occurs in Puracé National Park, in Colombia; in Ecuador, occurs in several protected areas on W slope of Andes, and in all national parks except Podocarpus on E slope.
Bibliography. Baez *et al.* (1997), Chapman (1917c), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1982), Moynihan (1979), Ridgely (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rodewald & Rodewald (2003), Roy *et al.* (1999), Smith (1971), Stotz *et al.* (1996), Traylor (1977), Zimmer (1940b).

59. Unstreaked Tit-tyrant

Anairetes agraphia

French: Taurillon uni **German**: Weißbauch-Tachurityrann **Spanish**: Cachudito Liso

Taxonomy. *Anaeretes agraphia* Chapman, 1919, Idma, 9000 feet [c. 2740 m], Peru.
Genus was long known as *Spizitornis*. This species and closely related *A. agilis* often placed together in a separate genus, *Uromyias*, recognizable on basis of syringeal and plumage characters, but molecular evidence indicates that they are imbedded within present genus. Three subspecies recognized.
Subspecies and Distribution.
A. a. plengei (Schulenberg & Graham, 1981) - N Peru (Cordillera Colán, in C Amazonas).
A. a. squamigerus (O'Neill & Parker, 1976) - C Peru from E La Libertad S to Huánuco.
A. a. agraphia Chapman, 1919 - upper Urubamba Valley (Cordillera Vilcanota), in Cuzco (SE Peru).
Descriptive notes. 12 cm; 10 g. Unstreaked version of *A. agilis*, with very long, graduated tail. Nominate race has crown and nape black, crown feathers elongated into bushy, flattened crest, bordered below by narrow white supercilium, broad dark brown eyestripe, face indistinctly streaked greyish and white; upperparts warm buff-brown, faintly flammulated darker brown; wings dusky brown; tail dusky, outermost rectrices edged white; throat and breast greyish-white, becoming



tinged with yellow on lower breast, breast feathers narrowly edged white (indistinctly scaled appearance), belly creamy white, flanks, lower belly and undertail-coverts pale yellowish-white; iris dark brown; bill black; legs dark grey. Sexes alike, female slightly smaller. Juvenile resembles adult. Race *squamigerus* has breast feathers broadly tipped and edged white, looking more distinctly scaled; *plengei* is much darker than others, olivaceous-brown on upperparts and tail, has breast feathers broadly tipped and edged white, lacks any tinge of yellowish on breast, and rest of flanks and underparts whiter, less yellowish. Voice. Very vocal; high-pitched, explosive "tzrieee", and several disyllabic versions of the same that may extend into short trill, also a chattery trill, wheezy "wheet", single soft "chip", and sharp "kekekeeek!".
Habitat. Upper montane cloudforest and shrubby elfin-forest thickets, with strong preference for mixed or pure stands of *Chusquea* bamboo; 2700-3600 m.
Food and Feeding. Insects. Forages actively, in pairs or in tight groups of up to six individuals, almost always with mixed-species flocks, 1-3 m above ground. Feeds by perch-gleaning, and by rapid upward strikes against lower leaf surfaces or twigs.
Breeding. Fledgling seen in Aug in Huánuco. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Northeast Peruvian Cordilleras EBA. Uncommon and local; possibly often overlooked. Occurs in Río Abiseo and Yanachaga-Chemillén National Parks and in Machu Picchu Historical Sanctuary. The cordilleras in which this species occurs have suffered from widespread deforestation as a result of agricultural cultivation, although cloudforests are still relatively pristine.
Bibliography. Chapman (1921), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Lanyon (1988b), Meyer de Schauensee (1982), Moynihan (1979), O'Neill & Parker (1976), Parker & O'Neill (1980), Ridgely & Tudor (1994), Schulenberg & Graham (1981), Smith (1971), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Zimmer (1940b).


ssp grisea
60
ssp cinerea
61
62
63
PLATE 20
inches 2
cm 5
64
ssp murina
ssp tumbezana
65
ssp inflava
ssp incomta
66
ssp flaveola
67
ssp leucophrys
♀
ssp pectoralis
♂
69
70
71
72
68
♂
ssp brevipennis
73
74
75
ssp berlepschi
76
77
ssp pelzelni

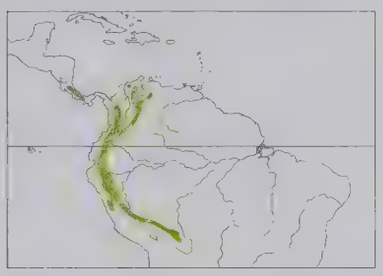
Genus *SERPOPHAGA* Gould, 1839

60. Torrent Tyrannulet

Serpophaga cinerea

French: Tyranneau des torrents **German**: Sturzbach-Kleintyrann **Spanish**: Piojito Guardarríos

Taxonomy. *L[eptopogon] cinereus* Tschudi, 1844, Tarma, Junín, Peru.
Possibly closest to *S. nigricans*. Two subspecies recognized.
Subspecies and Distribution.
S. c. grisea Lawrence, 1871 - Costa Rica and W Panama.
S. c. cinerea (Tschudi, 1844) - Andean slopes and foothills from Colombia (including Santa Marta Mts and Perijá Mts) and Venezuela (Mérida) S to Bolivia (La Paz, Cochabamba).



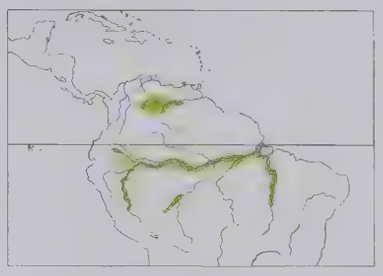
Descriptive notes. 11 cm; 7-8 g. Distinctive, pale grey tyrannulet of rocky torrents. Nominate race has black crown, nape and head side, semi-concealed white crownstripe, pale grey back and rump; wings black, two indistinct narrow whitish wingbars, white edges of innermost remiges; tail black; throat whitish, underparts dirty white, washed greyish on breast and flanks, plain white on lower belly and undertail-coverts; iris dark brown; bill black; legs black. Sexes alike. Juvenile has dark grey head and buffy wingbars. Race *grisea* is considerably smaller and paler than nominate, only small amount of white in crown. Voice. Dawn song a bubbly "chit-chitrrr, chit-chitrrr, chirr, chitrrr" repeated endlessly from atop a rock, frequently interspersed with extra "chit" notes; often gives single, loud "chirt!" while foraging.
Habitat. Most often along rocky margins of fast-flowing mountain streams and rivers surrounded by forest; also amid roots and rubble along banks of slower-flowing rivers near mountains, rarely in reedy marshes or flooded forest (especially *Alnus*) at higher elevations. Mostly 1100-2500 m in Andes, down to 300 m on W slopes in Colombia and Ecuador, and recorded up to 3700 m; in Costa Rica and Panama, 250-1850 m on Caribbean slope and 600-2000 m on Pacific slope, rarely lower (occasionally almost to sea-level). Numbers decline sharply at lower elevations.
Food and Feeding. Insects. Forages alone or in pairs, typically perching on rocks, roots, overhanging branches or riverbanks; makes short, quick sallies to snatch prey in air or against rock tops, mossy rock edges, mud banks and overhanging roots; aerial sallies up to 5 m in distance. Occasionally makes stop-and-go runs along mud bank, picking prey from surface in manner of *Muscisaxicola*, and may wade several centimetres into water. Often flicks or cocks tail upwards while foraging.
Breeding. Jan-Jun in Costa Rica and Panama, May-Sept in Colombia, and Jul probably through Dec in E Peru. Nest (Costa Rica) a substantial open cup composed of fine roots and fibres, entirely covered with moss and selaginella, lined with downy feathers, placed on horizontal branch 1-4 m over fast-flowing rocky stream. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally common; rare in W Peru. Occurs in several protected areas, e.g. Rancho Naturalista, in Costa Rica, Tambito Nature Reserve, in Colombia, Guaramacal National Park, in Venezuela, Machu Picchu Historical Sanctuary, in Peru, and Madidi National Park and Pilón Lajas Biosphere Reserve, both in Bolivia. In some districts it is negatively affected by siltation of watercourses.
Bibliography. Anon. (1998a), Baez *et al.* (1997), Blake (1958), Cory & Hellmayr (1927), Fitzpatrick (1980c, 1985c), Fjeldså & Krabbe (1990), Henderson (2002), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), McLellan (1938), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Salaman (1994), Slud (1964), Skutch (1960, 1985), Smith (1971), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Traylor (1977), Traylor & Fitzpatrick (1982), Varty *et al.* (1986), Wetmore (1972), Young & Zook (1999), Zimmer, J.T. (1930, 1940b), Zimmer, K.J. & Whittaker (2000).

61. River Tyrannulet

Serpophaga hypoleuca

French: Tyranneau des rivières **German**: Uferkleintyrann **Spanish**: Piojito Ribereño

Taxonomy. *Serpophaga hypoleuca* P. L. Sclater and Salvin, 1866, near Sarayacu, lower Río Ucayali, Peru.
Race *venezuelana* possibly indistinguishable from and synonymous with *pallida*, but paucity of specimens precludes definitive study. Three subspecies recognized.
Subspecies and Distribution.
S. h. venezuelana J. T. Zimmer, 1940 - R Orinoco and tributaries in extreme E Colombia and C Venezuela.
S. h. hypoleuca P. L. Sclater & Salvin, 1866 - SE Colombia, E Ecuador, E Peru, W Amazonian Brazil and N Bolivia.
S. h. pallida E. Snethlage, 1907 - lower Amazon and lower R Tapajós and R Tocantins, in EC Brazil.
Descriptive notes. 10·5 cm; 5·5-6·7 g. Slender, grey tyrannulet of river-island scrub. Nominate race has grey forehead, black mid-crown, central crown feathers elongated to form flat crest partially concealing white coronal patch; lores and partial lower eyering white; upperparts uniformly brownish-grey, wings unmarked dusky brownish-grey; tail long, dusky; lower face, chin and entire underparts white, tinged pale grey across breast; iris dark brown; bill black; legs dark grey. Sexes alike. Juvenile is like adult. Race *venezuelana* is smaller than nominate, paler, less black on crown, white crown patch smaller, virtually lacks crest; *pallida* is paler overall, less black on crown, greyish tinge on breast virtually lacking, bill shorter. Voice. Excited, slightly rising rattle preceded by 2-note phrase accented on second note, "chip-skéép-pf-t-t-t-t-t-t-et-et-et-chip-chip" or "d-d-d-r-r-re-re-re-reet?"; partners in duet sing rapid "p'dit-p'dit-p'dt" or "pikup, pikup, pikup"; also thin, weak "see-blik" or "pit-chick" while foraging.



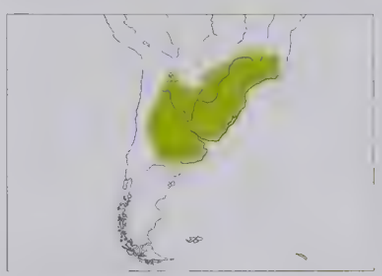
Habitat. Mainly low, sparse, early-successional scrub along large river margins and islands, also seasonally flooded savanna; sea-level to 200 m, locally to 600 m.
Food and Feeding. Small insects. Forages alone, or in pairs or family groups. Active, reminiscent of a gnatcatcher (*Polioptila*), restlessly moving about with horizontal posture through shrubs and sapling trees. Techniques mostly perch-gleaning, occasionally sallying short distances (less than 1 m) to hover-glean prey from leaf surfaces; rarely, aerial sallies. Resting posture more upright.
Breeding. Jun-Oct in Colombia; fledgling in Jul and nest in Oct in Venezuela. Nest a delicate, tightly constructed open cup, outer diameter 4·5 cm, inner diameter 3·2 cm, height 3·5 cm, made of fine grass, with spiderwebs woven in (especially at attachment points), lined with large feathers, placed 0·5 m up in fork between main stem and major branch of low shrub. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Resident; may move seasonally with changes in water level.
Status and Conservation. Not globally threatened. Rare to fairly common, but local. In Venezuela, fairly common at Hato Cedral and Hato El Frio (W Apure), and on river islets near Porto Ayacucho (NW Amazonas). Occurs near Jatun Sacha and Kapawi Lodges, both in Ecuador, in Manu National Park and Biosphere Reserve, in Peru, and in Mamirauá Reserve (Amazonas), in Brazil.
Bibliography. Cory & Hellmayr (1927), Cracraft (1985), Cruz & Andrews (1989), Friedmann (1948), Hennessey, Herzog & Sagot (2003), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1982), Pacheco (1995), Pearson (1975), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rojas *et al.* (1997), Sick (1993, 1997), Smith (1971), Stotz *et al.* (1996), Traylor (1977), Zimmer (1940b).

62. Sooty Tyrannulet

Serpophaga nigricans

French: Tyranneau noirâtre **German**: Rußkleintyrann **Spanish**: Piojito Gris

Taxonomy. *Sylvia nigricans* Vieillot, 1817, Paraguay.
Possibly closest to *S. cinerea*. Includes "*S. araguayae*" . Monotypic.
Distribution. S Bolivia (Tarija), Paraguay and SE Brazil (S from Minas Gerais and Espírito Santo) S to C Argentina (S to Río Negro) and Uruguay.



Descriptive notes. 12 cm; 9 g. Plumage is uniformly dark grey to brownish-grey above, crown slightly darker, semi-concealed white crownstripe; wings dusky grey, two indistinct paler grey wingbars, innermost remiges edged pale grey to whitish; tail black; chin whitish, underparts uniform pale grey, paler than back, flanks tinged more brownish posteriorly; iris dark brown; bill black; legs black. Sexes alike. Juvenile undescribed. Voice. Song a few staccato notes, followed by higher, sweet, "canary-like" notes.
Habitat. Almost always near water, most often along rocky or brushy margins of streams and rivers, also along irrigation ditches, farm ponds, and brushy pastures with standing water; occasionally in patches of brush and even woodland some distance from water. Sea-level to 1000 m.
Food and Feeding. Insects. Very active, restlessly flitting from perch to perch on rocks or branches, rarely to ground. Sallies into air, to ground and to water surface to snatch insects. Regularly pumps tail up and down, sometimes fans it while doing so.
Breeding. Oct-Dec. Nest, built by both sexes, a tightly woven open cup or basket up to 10 cm deep, 4 cm wide, of roots and grasses, lined with feathers, suspended from branch, twig or root and often under overhang, including artificial structure (e.g. bridge). Clutch 3 eggs; incubation and fledging periods not recorded. Occasionally parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Uncertain; apparently resident over most of range, but populations in extreme S possibly migrate N after breeding.
Status and Conservation. Not globally threatened. Uncommon. Occurs in many national parks and other protected areas throughout its range, e.g. Ybycuí National Park, in Paraguay, Aparados da Serra, Iguaçu and Serra da Canastra National Parks, all in Brazil, and Iguazú National Park and San Juan de Poriahú Private Reserve (in Iberá Provincial Reserve), both in Argentina. Given its tolerance of converted habitat and its reasonably large range, this species is not considered to be at any risk.
Bibliography. Babarskas *et al.* (2003), Barrows (1883), Belton (1985), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Fjeldså & Maijer (1996), Friedmann (1927), Hayes (1995), Klimaitis & Moschione (1987), Lanyon (1988b), Meyer de Schauensee (1982), Mohr *et al.* (2000), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores & Yzurieta (1984), Nores *et al.* (1983), de la Peña (1988, 1996), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Wetmore (1926).

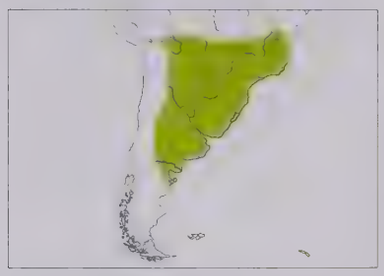
63. White-crested Tyrannulet

Serpophaga subcristata

French: Tyranneau à toupet **German**: Weißscheitel-Kleintyrann **Spanish**: Piojito Tiquitiqui

On following pages: 64. White-bellied Tyrannulet (*Serpophaga munda*); 65. Mouse-coloured Tyrannulet (*Phaeomyias murina*); 66. Cocos Flycatcher (*Nesotriccus ridgwayi*); 67. Yellow Tyrannulet (*Capsiempis flaveola*); 68. Sharp-tailed Tyrant (*Culicivora caudacuta*); 69. Bearded Tachuri (*Polystictus pectoralis*); 70. Grey-backed Tachuri (*Polystictus superciliaris*); 71. Dinelli's Doradito (*Pseudocolopteryx dinelliana*); 72. Crested Doradito (*Pseudocolopteryx sclateri*); 73. Subtropical Doradito (*Pseudocolopteryx acutipennis*); 74. Warbling Doradito (*Pseudocolopteryx flaviventris*); 75. Bronze-olive Pygmy-tyrant (*Pseudotriccus pelzelni*); 76. Hazel-fronted Pygmy-tyrant (*Pseudotriccus simplex*); 77. Rufous-headed Pygmy-tyrant (*Pseudotriccus ruficeps*).

Taxonomy. *Sylvia subcristata* Vieillot, 1817, Paraguay.
Taxonomic status controversial; sometimes considered conspecific with *S. munda*, but the two differ in plumage, also slightly in voice, and in Argentina are narrowly parapatric with limited hybridization; further study needed. Two subspecies recognized.
Subspecies and Distribution.
S. s. subcristata (Vieillot, 1817) - Bolivia (from N La Paz) and S Brazil (S from S Mato Grosso) S through Paraguay to Argentina (S to N Chubut).
S. s. straminea (Temminck, 1822) - SE Brazil (S Piauí and Bahia S to Rio Grande do Sul) and Uruguay.



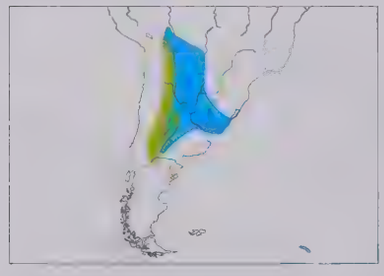
Descriptive notes. 11 cm; 6-7 g. Has thin white supercilium from bill to just behind eye, white broken eyering, thin dusky eyeline; greyish-olive above, crown and nape more pure grey, a few blackish central crown feathers partially concealing white coronal stripe; wings dusky to blackish, two bold whitish to pale buffy wingbars, outer webs of most remiges broadly edged pale buffy; tail dusky, outer web of outer rectrices whitish; face greyish-white, chin and throat white, breast grey, belly and lower abdomen pale yellow; iris dark brown; bill thin, black; legs grey. Sexes alike. Juvenile has buffy wingbars, little or no white in crown. Race *straminea* has brighter yellow belly than nominate. Voice. Song, during which tail shaken vigorously, a soft, cheery, but almost mechanical-sounding trill with few introductory rising notes, "psee psee psee-e-e-e-e-e-e", this repeated every 3-4 seconds during dawn song; also slower, bubbly "tweetweetweetweetweetwee", and occasionally other, more jumbled chatters.
Habitat. Lowland tropical forest edge, deciduous woodland, gallery forest, tall scrub, *cerrado*, gardens and plantations, also fencelines in agricultural areas; sea-level to 2000 m in Brazil, to 700 m in Argentina.
Food and Feeding. Insects. Very active, parulid-like tyrannulet, pausing only briefly while flitting through outer edges of scrubby vegetation, frequently displaying crest. Prey taken by perch-gleaning, hover-gleaning, and sallying into air or against vegetation; hover-gleaning accounted for up to 90% of foraging strikes in one study.
Breeding. Aug-Dec in Brazil and Argentina. Nest built by both sexes, a neat, tightly constructed open cup, outside diameter 6 cm, inside diameter 3·5 cm, height 5·5 cm, made of plant fibres, lined with feathers and other soft material, and profusely decorated with lichen, placed 1-6 m up on horizontal branch or tucked in small bromeliads in shrubby tree. Clutch usually 2 eggs, occasionally 3; incubation and fledging periods not recorded.
Movements. Partial migrant, but migratory habits still uncertain; apparently present in E Bolivia only Apr-Sept, presumably non-breeding visitors from extreme S populations, but apparently present and breeding Sept-Feb just across border in W Mato Grosso. Resident throughout year extreme SE Brazil (Rio Grande do Sul) and Uruguay.
Status and Conservation. Not globally threatened. Fairly common to common. Occurs in numerous protected areas throughout its range, e.g. San Rafael and Ybycuí National Parks, both in Paraguay, Beni Biosphere Reserve and Noel Kempff Mercado National Park, both in Bolivia, Aparados da Serra, Caparaó, Itatiaia, Serra da Canastra and Tijuca National Parks, all in Brazil, and Costanera Sur Ecological Reserve and San Juan de Poriahú Private Reserve (in Iberá Provincial Reserve), both in Argentina. Exhibits tolerance of converted habitats within its relatively large range, and is not at any risk.
Bibliography. Babarskas *et al.* (2003), Belton (1985), Bó (1969), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Cove & Vidal-Ojeda (2003), Cueto & López (2002), Di Giacomo (2004), Dubs (1992), Fitzpatrick (1980c), Harris (1998), Hayes (1995), Herzog (2001), Klimaitis & Moschione (1987), Lanyon (1988b), López (1997), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Narosky & Yzurieta (1987, 1993), Nores *et al.* (1983), de la Peña (1988, 1995, 1997), Remsen & Traylor (1989), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sick (1993, 1997), Smith (1971), Stotz *et al.* (1996), Straneck (1993), Traylor (1977), Urben-Filho *et al.* (2000), Wetmore (1926), Zimmer (1940b, 1955b).

64. White-bellied Tyrannulet

Serpophaga munda

French: Tyranneau à ventre blanc **Spanish**: Piojito Ventriblanco
German: Weißbauch-Kleintyrann
Other common names: Grey-crowned Tyrannulet ("*S. griseiceps*")

Taxonomy. *Serpophaga munda* Berlepsch, 1893, Samaipata, Santa Cruz, Bolivia.
Taxonomic status controversial; sometimes considered a race of *S. subcristata*, but the two differ in plumage, also slightly in voice, and in Argentina are narrowly parapatric with limited hybridization; further study needed. Described taxon *S. griseiceps*, from Bolivia (Cochabamba), with reduced white in crown and more buffish wingbars, widely believed to be based on juvenile specimens of present species, and thus treated as synonym of it, but now considered by some to represent a separate species on grounds of voice, plumage and distribution; further research required. Monotypic.
Distribution. Breeds in Andes of W Bolivia (S from La Paz) and W Argentina (S to Neuquén and W Rio Negro); migrates E, as far as coast in SE Brazil and Uruguay, and as far N as NC Bolivia (S Beni).



Descriptive notes. 11·5 cm; 8 g. A grey-and-white version of *S. subcristata*. Has thin white supercilium from bill to just behind eye, white broken eyering, thin dusky eyeline; crown and nape pure grey, a few blackish central crown feathers partially concealing white coronal stripe, otherwise plain grey with only faint olive tinge above; wings dusky to blackish, two bold white wingbars, outer webs of most remiges broadly edged whitish to pale buff; tail dusky, outer webs of outer rectrices whitish; face greyish-white, chin and throat white, breast pale grey, belly and lower abdomen white, sometimes faintly tinged creamy yellow; iris dark brown; bill thin, black; legs grey. Sexes alike, female slightly smaller. Juvenile has buffy wingbars, little or no white in crown. Voice. Song, during which tail shaken vigorously, a soft, mechanical rattle beginning with a few introductory notes, "psee-psee-e-e-e-e-e-e-e-e-e-e-e", slightly higher-pitched, noticeably faster and longer than that of *S. subcristata*, repeated every 3 seconds during dawn song, and sometimes almost as frequently during daytime while patrolling territory; also slower, syncopated "tsi, tsu-tsu, tsu-tsu, tsu-tsu" and other, more jumbled chatters.
Habitat. Semi-arid montane scrub, thorn-forest, and deciduous woodland in foothills and highlands, to 2900 m; in non-breeding season, found in Chaco and variety of other scrub and open-country habitats, including agricultural areas.
Food and Feeding. Insects. Very active, parulid-like tyrannulet, pausing only briefly while flitting through outer edges of scrubby vegetation, frequently displaying crest. Prey taken by perch-gleaning and by sallying into air or against vegetation.
Breeding. Oct-Jan in Argentina. Nest built by both sexes, taking 4-7 days, a neat, tightly constructed open cup, outside diameter 5·5 cm, inside diameter 3·5 cm, height 5·5 cm, made of grass stems and other plant fibres, decorated with spider oothecae and lichens, profusely lined with feathers, once almost entirely tinamou (Tinamidae) feathers, and with plant wool; placed 3-5 m up on horizontal or tilted branch at junction of narrow limbs, usually enclosed by dense cover and thorny twigs, in shrubby tree, especially chañar (*Geoffroea*) or other thorny shrub. Clutch 2-3 eggs; incubation by both sexes (unusual among Tyrannidae), period 13-15 days; both parents feed chicks, nestling period 13-14 days.
Movements. Descends to lower elevations and moves N & E into Chaco and Patagonian lowlands during austral winter, some straying all the way to coastal regions of SE Brazil and Uruguay.
Status and Conservation. Not globally threatened. Fairly common to common; rare breeder in Paraguayan Chaco. Recorded at Beni Biosphere Reserve, in Bolivia.
Bibliography. Babarskas *et al.* (2003), Belton (1985), Bencke *et al.* (2002), Canevari *et al.* (1991), Chesser (1997), Cintra & Yamashita (1990), Cory & Hellmayr (1927), Di Giacomo (2004), Fjeldså & Krabbe (1990), Friedmann (1927), Herzog (2001), Joseph (1996), Lanyon (1988b), López (1997), Mezquida (2004), Mezquida & Marone (2000, 2002), Meyer de Schauensee (1982), Miserendino (1998), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nellar (1993), Nores *et al.* (1983), de la Peña (1987, 1988, 1995, 1997), Ridgely & Tudor (1994), Short (1975), Smith (1971), Stotz *et al.* (1996), Straneck (1993), Traylor (1977), Wetmore (1926), Zimmer, J.T. (1940b, 1955b), Zimmer, K.J. & Whittaker (2000).

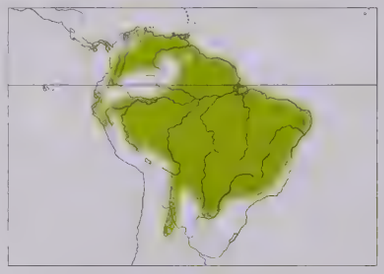
Genus *PHAEOMYIAS* Berlepsch, 1902

65. Mouse-coloured Tyrannulet

Phaeomyias murina

French: Tyranneau souris **German**: Graubraun-Kleintyrann **Spanish**: Piojito Pardo
Other common names: Tumbes Tyrannulet (*tumbezana*, *inflava* and *maranonica*)

Taxonomy. *Platyrhynchus murinus* Spix, 1825, Joazeiro, Rio São Francisco, northern Bahia, Brazil.
Race *tumbezana* recently treated as a separate species, presumably including *inflava* and *maranonica*, but definitive studies lacking. Described taxon *ignobilis* (from SC Bolivia, NW Argentina and Paraguay) indistinguishable from nominate in large series, and thus merged with latter. Seven subspecies recognized.
Subspecies and Distribution.
P. m. eremonoma Wetmore, 1953 - Pacific lowlands of Panama.
P. m. incomta (Cabanis & Heine, 1859) - Colombia (N & Andes) and N Ecuador E to Venezuela (S to Apure, N Amazonas and N Bolívar) and Trinidad (including Monos I).
P. m. tumbezana (Taczanowski, 1877) - Pacific lowlands of SW Ecuador and NW Peru (Tumbes, E Piura, NE Lambayeque).
P. m. inflava Chapman, 1924 - arid NW Peru from C Piura and C Lambayeque S to N Lima.
P. m. maranonica J. T. Zimmer, 1941 - arid NC Peru in Marañón Valley, W Amazonas, E Cajamarca and E La Libertad.
P. m. wagae (Taczanowski, 1884) - the Guianas, Amazonian Brazil, E Peru and N Bolivia.
P. m. murina (Spix, 1825) - C, E & S Brazil (Maranhão, Ceará and Pernambuco S to Mato Grosso and São Paulo), C Bolivia (Cochabamba S to Tarija), Paraguay and NW Argentina (S to La Rioja).



Descriptive notes. 12 cm; 7-9 g. Nondescript brownish flycatcher with medium-sized bill. Nominate race has broad but weakly defined whitish to creamy supercilium, narrow whitish eyering; uniformly olive-brown to grey-brown above; wings dusky, wing-coverts tipped and inner remiges broadly edged whitish to dull cinnamon (wingbar colour variable, from bright cinnamon in fresh plumage to almost pure white in worn plumage); tail dusky; face and throat pale greyish-white to pure white, grading to pale yellow below, breast washed or flammulated with pale olive; iris brown; bill rather thick and rounded, horn-coloured, lower mandible pale pink at base; legs grey. Sexes alike. Juvenile resembles adult. Races vary mainly in brightness and intensity of cinnamon cast overall; *eremonoma* similar to nominate, with wing-coverts edged dull buff; *incomta* is very similar to nominate but browner above, paler and creamy white below, breast more greyish than olive; *wagae* has darkest green cast above, more intense yellow below, narrower extent of white on throat, somewhat larger bill; *inflava* has ochraceous wingbars and remex edges broad but diffuse, underparts dirty white, lacking yellow, with pale brownish-grey breast; *tumbezana* is not so pale as previous, has brighter cinnamon wingbars, darker grey-brown breast, pale yellow below limited to centre of belly; *maranonica* resembles previous, but slightly more richly coloured and yellower below. Voice. Dry, nasal chatter preceded by 1-2 sharper notes, "chéé-dit-tr-tr-tr-tr-tr-tr-tr-tr" or "jejejejejejew", often gives only the first 2 notes several times before the chatter; dawn song a lively series of chattery notes ending in sharper "tu-túp", repeated over and over, often increasing in intensity. On arid Pacific coast (*tumbezana*) a sharp, squeaky "squeeky-squeey-kit!".
Habitat. Arid lowland and lower montane scrub, cactus scrub and thorn-scrub, deciduous woodland, *cerrado*, river-edge forest, gallery forest, early second growth, early-successional brush along river margins, borders of humid forest, also parks, gardens, mangroves. Sea-level to 2400 m, mostly below 1000 m; in Bolivia breeds to 2150 m (one record at 3085 m), but only below 800 in austral winter.
Food and Feeding. Insects; fruits, especially of mistletoe (Loranthaceae), also eaten extensively. Usually forages alone, in dense foliage; perches upright, with short pauses between foraging attempts. Makes variety of sally-gleaning manoeuvres, especially upward hover-gleans and upward strikes.
Breeding. May-Oct in Colombia, Apr-Jun in Surinam and Oct-Dec in Argentina and Brazil. Nest, built by female alone, an open cup composed of plant fibres and mosses, with feathers incorporated

throughout and in lining, usually placed less than 4 m above ground in fork of branch or crotch of thin tree. Clutch 2 eggs, laid with interval of 1 day; incubation, by female alone, 14-17 days; chicks fed by both parents, with insects, berries added after 8-10 days, nestling period 17 days.
Movements. Moves downslope after breeding; S populations in Bolivia, S Brazil, Argentina and Paraguay migrate N, apparently spending austral winter in Amazon Basin.
Status and Conservation. Not globally threatened. Uncommon to common. Occurs in many national parks and other protected areas throughout its large range. Able to thrive in wide variety of dry and moist habitats; accepts secondary and converted habitats. Spreads into new areas, e.g. E lowlands in Ecuador, following deforestation. Not likely to be at any risk in the near future.
Bibliography. Anon. (1998a), Belcher & Smooker (1937), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Davies *et al.* (1994), Di Giacomo (2004), Fjeldså & Krabbe (1990), ffrench (1991), Giraudo & Baldo (1998), Haverschmidt (1968, 1970), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hayes *et al.* (1994), Hilty (2003), Hilty & Brown (1986), Lanyon (1984a, 1988b), Lowen *et al.* (1996), Marchant (1960), Narosky & Salvador (1998), Oniki & Willis (1983b), Oren & Parker (1997), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Short (1975), Sick (1993, 1997), Skutch (1985), Stotz *et al.* (1996), Temple (2002), Tostain *et al.* (1992), Traylor (1977), Wetmore (1972), Williams & Tobias (1994), Zimmer (1930, 1941b).

Genus *NESOTRICCUS* C. H. Townsend, 1895

66. Cocos Flycatcher

Nesotriccus ridgwayi

French: Tyranneau de Cocos **German**: Cocos-Insel-Tyrann **Spanish**: Mosquerito del Coco
Other common names: Cocos Island Flycatcher

Taxonomy. *Nesotriccus Ridgwayi* C. H. Townsend, 1895, Cocos Island, off Pacific coast of Costa Rica. Affinities somewhat uncertain; anatomical and behavioural characters indicate that it is closely related to *Phaeomyias*. Monotypic.
Distribution. Cocos I, SW of Costa Rica.



Descriptive notes. 11 cm; 11 g. Variably coloured tyrannid with unusually long and broad bill. Above, is greyish-olive to dark brownish-olive, crown like back, faint supercilium slightly paler; wings and tail dusky, two wingbars and narrow edges of remiges dull yellowish-buff; greyish-buff to pale yellowish below, breast washed brownish to olive; iris dark brown; upper mandible brown to black, lower mandible whitish, flesh-coloured or pale horn with dusky tip; legs dark grey. Sexes alike. Juvenile is browner, with buffy to cinnamon wingbars. VOICE. Male has two song types, an explosive, dry, descending chatter of 6-9 syllables, speeding up near end, and a series of low-intensity "tic" notes followed by explosive trill of 7-10 syllables, both types loudest at onset, both sometimes interspersed with staccato notes; female has only one song, an explosive series of 9-10 notes followed by additional, much softer notes trailing off, song loudest at onset and descending slightly as it trails off; members of pair often sing rapidly back and forth in crude duet, typically initiated by female.
Habitat. Humid tropical and subtropical forest and forest edge, second growth, and scrubby and swampy areas, from sea-level to 575 m.
Food and Feeding. Arthopods; occasionally fruits. In analysis of 26 stomachs, diet overwhelmingly dominated by fulgoroid homopterans (planthoppers representing 43% and 64% of prey in two separate years), followed by orthopterans (6-12%) and ants (Hymenoptera; 7-14%), then arachnids (5%) and beetles (Coleoptera; 3-15%). Fruits taken include *Clusia rosea*; seeds regurgitated. Forages in dense vegetation, well above ground, making short pauses and frequent upward strikes against leaf undersides; also uses aerial hawking, hover-gleaning and perch-gleaning; evasive prey often pursued acrobatically after the initial sally.
Breeding. Jan-Apr. Nest constructed by both sexes, a substantial open cup, outside diameter 7·5 cm, inside 4·5 cm, of plant fibres, fine black fungal rhizomorphs (*Marasmius*), copiously lined with feathers, and generously adorned with spider oothecae, 10-25 m above ground and well anchored to twigs and vines within outer foliage near top of tall tree; territory size 0·25 ha. Clutch apparently only 1 egg; female alone incubates, period not recorded; fledging period not documented.
Movements. Resident.
Status and Conservation. VULNERABLE. Restricted-range species: present in Cocos Island EBA. Common in most habitats. Estimated population of several tens of thousands, within global range of c. 25 km². Main threat is introduced predators, primarily rats (*Rattus*) and cats, and introduced herbivores (deer, pigs, goats), but no evidence so far of a decline in the species' range or population. Pigs, especially, devastate the lower strata and understorey of native forest and inhibit forest regeneration, but the flycatcher appears tolerant of at least some habitat disturbance. No efforts have been made to reduce populations of introduced mammals. Cocos I has no permanent settlements, although ecotourism is increasing to some degree, but it still retains a dense and largely undisturbed forest cover and was declared a national park in 1978.
Bibliography. Anon. (1998a), Collar *et al.* (1994), Cory & Hellmayr (1927), Eisenmann (1955), Kroodsma *et al.* (1987), Lanyon (1984b, 1988b), Ridgway (1907), Sherry (1985, 1986), Slud (1967), Stattersfield & Capper (2000), Stiles & Skutch (1989), Stotz *et al.* (1996), Traylor (1977).

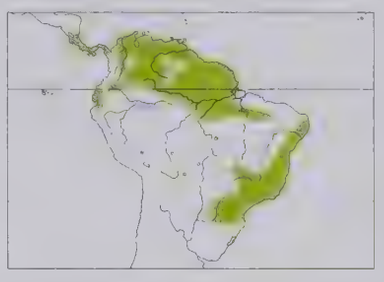
Genus *CAPSIEMPIS* Cabanis & Heine, 1859

67. Yellow Tyrannulet

Capsiempis flaveola

French: Tyranneau flavéole **German**: Zitronentyrann **Spanish**: Mosquerito Amarillo

Taxonomy. *M[uscicapa] flaveola* M. H. K. Lichtenstein, 1823, Bahia, Brazil.
Genus was previously merged with *Phylloscartes*, but cranial and syringeal evidence suggest relationships elsewhere within Tyrannidae, perhaps near *Phaeomyias* and *Nesotriccus*; vocal similarities suggest relationship with *Inezia subflava-caudata* group. Proposed race *amazonus* (the Guianas, N & EC Brazil), described on basis of very few specimens, appears to be not reliably distinguishable from *cerula* in larger series of specimens; thus, merged with latter. Five subspecies recognized.
Subspecies and Distribution.
C. f. semiflava (Lawrence, 1865) - S Nicaragua S to E Panama, including Coiba I.
C. f. leucophrys Berlepsch, 1907 - NC Colombia (Sucre E to Magdalena Valley) and NW Venezuela (base of Sierra de Perijá S to Táchira and W Mérida, and SW Lara).
C. f. magnirostris Hartert, 1898 - SW Ecuador (Pichincha S to Guayas and El Oro).
C. f. cerula Wetmore, 1939 - locally E of Andes in Colombia, Venezuela, the Guianas, N Brazil (E Amazonas and R Branco E to Amapá), E Ecuador, SE Peru and N Bolivia.
C. f. flaveola (M. H. K. Lichtenstein, 1823) - E Bolivia (N Santa Cruz) E to E & SE Brazil (Pernambuco S to Rio Grande do Sul), E Paraguay and NE Argentina (Misiones).



Descriptive notes. 11·5 cm; 8 g. Relatively long-billed tyrannid with upper mandible somewhat curved. Nominate race has prominent bright yellow supercilium, bright yellow broken eyering; dark yellowish-olive above, crown slightly darker and with feathers somewhat elongated to form bushy crest; wings and tail dusky olive, two broad but indistinct wingbars pale yellow to buffy yellow; throat yellow, face yellowish, underparts bright saturated yellow, breast tinged ochraceous, side of breast tinged olive; iris dark brown; bill black, lower mandible typically pale at base; legs dark grey. Sexes alike. Juvenile resembles adult. Races differ mainly in coloration and bill size, also wingbars generally more distinct in N: *semiflava* has much paler yellow underparts; *leucophrys* has pure white supraloral area and most of supercilium, whitish throat; *cerula* is larger and longer-billed than others except previous, from which it differs in having all-yellow supercilium; *magnirostris* has larger bill, pale yellow supercilium. VOICE. Extremely vocal, with variety of pleasant whistled or jumbled sputtery notes, mellow single or double whistles, excited variable mix of whistled notes, e.g. "pit-te-keek" or "wheet-eet, wheet-eet, whee" or "taytiréétì", repeated many times in succession, sometimes speeding up; often sung by both members of pair as duet. Also dry, nasal trill, "brrrrrrrt".
Habitat. Humid lowland habitats away from tall forest; dense thickets, vine tangles and bamboo stands, including those associated with large forest openings and edges of lakes and streams; also dense second growth, and low, dense, scrubby vegetation in overgrown pastures and coffee plantations; also mangroves. Found in thickets of gallery forest in Colombia and N Brazil; in shrubby vegetation on sandy soil in Surinam; apparently restricted to dense *Guadua* bamboo stands in SE Peru; dense forest edges and *restinga* in Brazil. To 1500 m, mostly lower.
Food and Feeding. Small insects; occasionally small fruits and berries. Almost always forages in pairs or in family groups of 3-4 individuals, rarely joins mixed-species flocks. Very active, restlessly moving about through thick vegetation, often difficult to see. Food obtained mostly by perch-gleaning; occasionally by sallying short distances (less than 1 m) to hover-glean prey from leaf surfaces, rarely in aerial sallies.
Breeding. Apparently in virtually all months in Costa Rica, and perhaps also in Panama (nest found in Sept); Apr-May in Colombia and Jul probably through Dec in E Peru; fledgling in Nov in Brazil. Nest (Costa Rica) a substantial open cup of light-coloured plant fibres, grass blades, bark shreds or moss, with moss or selaginella attached to outer wall, placed 3-6 m up in fork or crevice of low tree or tall, dense shrub. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to common. Occurs in many national parks and other protected areas throughout its extensive range, e.g. Río Negro Jaguar Reserve and Tarcol Lodge, in Costa Rica, Río Claro Reserve and Tinigua National Park, in Colombia, Machalilla National Park and Río Palenque Science Centre, in Ecuador, Pacaya-Samiria National Reserve, in Peru, Caaguazú, San Rafael and Ybycuí National Parks, all in Paraguay, and Iguaçu, Itatiaia, Serra da Canastra and Tapajós National Parks, all in Brazil. Given its tolerance of converted habitats and secondary habitats, this species is not considered likely to become threatened in near future.
Bibliography. Anon. (1998a), Belcher & Smooker (1937), Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes *et al.* (1994), Hilty (2003), Hilty & Brown (1986), Kratter (1997), Lanyon (1984a, 1988b), Lowen *et al.* (1996), Narosky & Salvador (1998), Olson (1997), Oren & Parker (1997), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Servat (1993), Sick (1993, 1997), Silveira *et al.* (2003), Skutch (1960, 1985), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Traylor (1977), Tostain *et al.* (1992), Wetmore (1972), Williams & Tobias (1994), Zimmer, J.T. (1955b), Zimmer, K.J. & Whittaker (2000).

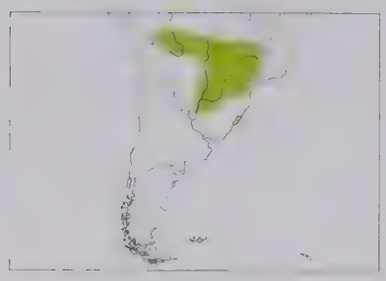
Genus *CULICIVORA* Swainson, 1827

68. Sharp-tailed Tyrant

Culicivora caudacuta

French: Tyranneau à queue aiguë **German**: Spitzschwanz-Grastyrann **Spanish**: Tachurí Coludo
Other common names: Sharp-tailed Grass-tyrant

Taxonomy. *Muscicapa caudacuta* Vieillot, 1818, Paraguay.
Affinities uncertain, and genus often treated as *incertae sedis*, because of unusual plumage and tail feathers, presence of only ten rectrices, and non-exaspidean tarsi. Probably related to *Polystictus* on basis of similarities in plumage, bill morphology, behaviour and habitat. Monotypic.
Distribution. Locally in E Bolivia (Beni, La Paz, Santa Cruz), C & S Brazil (Mato Grosso, Mato Grosso do Sul, C Goiás, and S Bahia S to São Paulo and W Paraná), E Paraguay and N Argentina (S to Santa Fe, Entre Ríos and Corrientes).
Descriptive notes. 10·5 cm. Distinctively plumaged tyrannid with unique long, graduated tail. Male has blackish crown, slightly bushy, bordered below by broad white supercilium, narrow black eyeline,



rest of face warm buffy brown; upperparts buffy brown, broadly streaked blackish; wings buffy brown, feathers edged and streaked with black and pale buff; tail buffy brown, central rectrices stiffened, webs of most rectrices decomposed and stiffened (resembling *Synallaxis* spinetail) on distal end; chin white, underparts pale yellowish-white, flanks deeply suffused warm cinnamon buff; iris dark brown; bill black; legs black. Female is slightly smaller and shorter tailed than male, crown browner. Juvenile is more buffy overall. Voice. Song a series of weak, short, ascending burry whistles, "tweee tweee tweee", presumably by male, as sometimes initiates duet in which another individual (female?) up to 15 m away gives 4-5 rapid "chip" notes, rising and then falling, immediately after each whistle (reminiscent of *Todirostrum* duets); call a series of unmusical "tick" notes, sometimes in rapid series by juveniles after song of adult.

Habitat. *Campo* and dry grassland, wetter and taller portions of native grassland, especially where bordering shrubby marshes or streams, rarely in disturbed vegetation; mostly lowlands, to 1400 m.

Food and Feeding. Insects; possibly also seeds. Forages in pairs or in small, tight groups of up to five (sometimes to ten) individuals; occasionally joins mixed flocks of other grassland birds. Perches on vertical stems and shrubs, favours areas of taller exposed weeds and taller grass clumps; sallies to adjacent stems and leaves to pick, strike or hover-glean insects, makes occasional aerial sallies. Occasionally feeds by perching below mature seedheads, even hanging upside-down, and picking at them like a *Carduelis* finch or a tit (Paridae).

Breeding. Oct-Mar. Nest an elaborate open cup, external diameter 5 cm, internal diameter 3 cm, cup depth 4 cm, made of grasses, other plant fibres, thistle down and spiderwebs, placed low down in isolated shrub near ground; nests in N Argentina (Formosa) mostly in clumps of ironweed (*Vernonia chamaedrys*). Clutch 3 eggs; incubation and fledging periods not documented.

Movements. Resident.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Mostly rare and very localized; locally fairly common; possibly most abundant and widespread in E Bolivia. Habitat loss probably the main factor behind its current rarity. By 1993, two-thirds of *cerrado* region in C Brazil had been heavily or moderately altered; most habitat conversion for eucalypt (*Eucalyptus*) and pine (*Pinus*) plantations, livestock farming, and large-scale cultivation of soybeans, rice and other exportable crops has occurred since 1950, encouraged by government land reform. Outside protected areas, few remaining undisturbed areas may soon be degraded by spreading fires and overgrazing, or may completely disappear through agricultural conversion. Moreover, breeding pairs apparently confined to dry grassland; abundance thus highest in protected areas, e.g. in Noel Kempff Mercado National Park and Beni Biosphere Reserve, in Bolivia, Mbaracayú Forest Nature Reserve, in Paraguay, and Brasília, Emas and Serra da Canastra National Parks, all in Brazil. If habitat conversion is not halted, the species' conservation status will probably have to be upgraded to that of Vulnerable. In Paraguay, for example, it appears locally extinct in Orient, where no records since 1932. On other hand, recent range expansions recorded in Bolivia (La Paz) and Argentina (Entre Ríos) and recently rediscovered in E Paraguay.

Bibliography. Bates & Parker (1998), Bates *et al.* (1998), Canevari *et al.* (1991), Capper *et al.* (2000), Cavalcanti (1988), Chebez (1994), Chesser (1997), Collar & Andrew (1988), Collar *et al.* (1994), Cory & Hellmayr (1927), Di Giacomo (1996, 2004), Dubs (1992), Fitzpatrick (1980c), Hayes (1995), Lowen *et al.* (1996), Madroño & Esquivel (1995), Narosky & Salvador (1998), Parker & Willis (1997), Parker, Castillo *et al.* (1991), Parker, Stotz & Fitzpatrick (1996), Pearman & Abadie (1995), de la Peña (1988), Ridgely & Tudor (1994), Short (1975), Sick (1993, 1997), Silveira (1998), Souza (1999), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Traylor (1977), Traylor & Fitzpatrick (1982), Willis & Oniki (1988c).

Genus *POLYSTICTUS* Reichenbach, 1850

69. Bearded Tachuri

Polystictus pectoralis

French: Tyranneau barbu **German**: Streifenkinn-Grastyrann **Spanish**: Tachurí Barbado

Taxonomy. *Sylvia pectoralis* Vieillot, 1817, Paraguay.

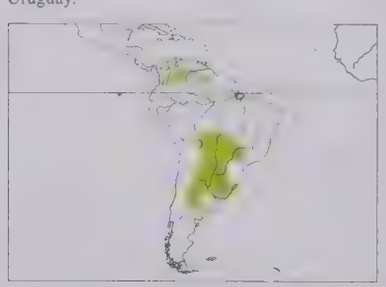
Was for long treated in a separate genus, *Habrura*; relationship with *P. superciliaris* needs confirmation. Race *bogotensis* (possibly extinct) probably merits rank of full species. Three subspecies recognized.

Subspecies and Distribution.

P. p. bogotensis (Chapman, 1915) - very local in temperate zone in Cundinimarca (savannas of Bogotá) and Valle (upper Dagua Valley), in Colombia.

P. p. brevipennis (Berlepsch & Hartert, 1902) - E Colombia, S Venezuela, Guyana, Surinam and N Brazil (Roraima, Amapá, W Pará).

P. p. pectoralis (Vieillot, 1817) - E Bolivia (Santa Cruz), S Brazil (locally from Mato Grosso S to Rio Grande do Sul), Paraguay, N Argentina (S to Mendoza, La Pampa and Buenos Aires) and Uruguay.



Descriptive notes. 8-10 cm; 6-8 g (*brevipennis*). Male nominate race has dusky grey to blackish crown, elongated feathers forming flattened bushy crest with semi-concealed white coronal patch; short white supercilium, narrow blackish eyeline; upperparts buffy brown, rump tawny to rufous; wings dusky, feathers edged cinnamon-buff, two bright cinnamon-buff wingbars; tail dusky; head side and chin ("beard") finely striped black and white, underparts pale yellowish-white, washed with cinnamon on breast and flanks; iris fuscous brown; bill black; legs black. Female is slightly smaller than male, duller, crown and face mostly brown, throat whitish, lacks "beard". Juvenile has reddish edges of primaries, buffy wingbars, deeper yellowish underparts. Race *brevipennis* is very similar to nominate but significantly smaller (male wing chord 40-43 mm, compared with 46-50 mm in nominate), crown feathers less elongated, male with less black on face and throat; *bogotensis* is distinctive, with much narrower, more elongated crown feathers, less white in crown, back more tawny, wingbars and edges of remiges deeper tawny, supercilium bright buff, side of head ochraceous tawny, flanks much deeper, richer tawny, only few black feathers on throat. Voice. Song a plaintive "wheee-whidididirrr" or "tee-tee-tee-teet", sometimes ending in low, guttural trill and followed by wing-buzz; weak rising "feee" or "pewee", with upward tail-flicking, as contact call.

Habitat. *Campo*, drier portions of native grassland, savanna with scattered shrubs, tall grass in *cerrado*; also low heath-like shrubs and tall grass in SE Venezuela (Gran Sabana); very rarely in disturbed vegetation. Mostly lowlands, to 1300 m; *bogotensis* at 2600-2700 m.

Food and Feeding. Insects. Inconspicuous; forages singly or in pairs, occasionally joins mixed flocks of other grassland birds. Perches on vertical stems; sallies to adjacent stems to glean prey, rarely flying far.

Breeding. Jun-Jul in E Colombia and Sept-Jan in Argentina and Brazil. Possibly polygynous; speculation that only female cares for young needs confirmation. Flight display for 20-100 m, angling upwards to 10 m above ground, while uttering weak song ending in orthopteran-like wing-buzzing; in near-dark before dawn, male flies in circles over grass while giving song and wing-buzz every 3 seconds. Nest an elaborate open cup, external diameter 5 cm, internal diameter 4 cm, cup depth 3 cm, made of grasses, other plant fibres, thistle down and spiderwebs, placed less than 1 m above ground in shrub or thistles, sometimes sewn to two or more stalks. Clutch 3 eggs; incubation and fledging periods not documented.

Movements. Apparently an austral migrant; records from Bolivia and adjacent Brazil only during winter months.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Usually rare to uncommon, but perhaps often overlooked; very local, but fairly common in a few localities. Fairly common in part of Meta (Colombia), in Roraima (N Brazil), and in one area in Córdoba (Argentina). Believed to be declining in Venezuela, and endangered in Paraguay; no recent records from Bolivia. Race *bogotensis* possibly extinct. Occurs in Canaíma National Park, in Venezuela, Sipaliwini Savanna Nature Reserve, in Surinam, Tatí Jupí Reserve, Mbaracayú Forest Nature Reserve, Sombrero Private Reserve and San Rafael National Park, all in Paraguay, and Otamendi Reserve, San Juan de Poriahú Private Reserve (in Iberá Provincial Reserve) and Mburucuyá National Park, all in Argentina; in Brazil, up to six individuals observed per day in Itirapina State Ecological Station, and found also in Das Emas and Chapada dos Guimarães National Parks. Current rarity probably a result mainly of habitat loss. By 1993, two-thirds of *cerrado* in C Brazil had been heavily or moderately altered; most habitat conversion for eucalypt (*Eucalyptus*) and pine (*Pinus*) plantations, livestock farming, and large-scale cultivation of soybeans, rice and other exportable crops has occurred since 1950, encouraged by government land-reform schemes; outside protected areas few undisturbed areas remain, and these may soon be degraded by spreading fires and overgrazing, or could completely disappear through agricultural conversion. Grasslands in Paraguay, Argentina and elsewhere face similar threats.

Bibliography. Babarskas *et al.* (2003), Brooks *et al.* (1993), Canevari *et al.* (1991), Capper *et al.* (2000), Chebez (1994), Chesser (1997), Collar & Andrew (1988), Collar & Wege (1995), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Di Giacomo (2004), Fjeldså & Krabbe (1990), Haverschmidt & Mees (1994), Hayes (1995), Hilty (1985, 2003), Hilty & Brown (1986), King (1978/79), Klimaitis & Moschione (1987), Lowen *et al.* (1996), Maceda *et al.* (1997), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Parker & Willis (1997), de la Peña (1988), Ridgely & Tudor (1994), Short (1975), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Traylor (1977), Willis & Oniki (1988c), Zimmer (1955b).

70. Grey-backed Tachuri

Polystictus superciliaris

French: Tyranneau bridé **German**: Graunacken-Grastyrann **Spanish**: Tachurí Gris

Taxonomy. *E[uscarthmus] superciliaris* Wied, 1831, Vale Fundo, southern Bahia, Brazil.

Affinities uncertain; relationship with *P. pectoralis* requires confirmation. Monotypic.

Distribution. Mountain ridges of interior SE Brazil from C Bahia S to N São Paulo.



Descriptive notes. 9·5 cm; 6 g. Has short white supercilium, white eyering; crown grey, feathers elongated and partially concealing white coronal patch; upperparts brownish-grey; wings dark dusky brown, tips of wing-coverts and edges of remiges faintly paler brown; tail dusky; chin whitish, throat and underparts medium pinkish-buff, fading to whitish on lower belly; iris dark brown; bill black; legs black. Sexes alike, female slightly smaller than male. Juvenile has cream-coloured belly. Voice. Rapid and repeated "pilrup-pilrup-pilrup" and "fruirilrilrilrilril"; weak, fast, musical trill beginning with stuttering notes, rising slightly, then trailing off; also "tee-kpuj" and quiet contact call, "purp".

Habitat. Rocky grassland with scattered shrubs (*campo rupestre*), abandoned brushy pastures, high-altitude grassland, and brushy edges of cloudforest; 900-2300 m, mostly below 1700 m.

Food and Feeding. Insects. Forages mainly alone, also in pairs or trios. Clings to vertical stems, or perches on low shrubs, rarely dropping to ground; mainly sally-gleaning and perch-gleaning, often returning to same perch; weak flier.

Breeding. Jul-Sept. Nest a small cup of rootlets and moss, placed in fork of small shrub. Clutch 1-2 eggs; no information on incubation and fledging periods.

Movements. Resident.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Central Brazilian Hills and Tablelands EBA and Atlantic Forest Mountain EBA. Generally uncommon and very local; perhaps commonest in Serra do Espinhaço. In Caraça National Park, the species is common in *campo rupestre* and abandoned pastures and, especially, in natural grassland; it occurs also in Serra da Canastra and Serra do Cipó National Parks. Montane habitats within its range have suffered less destruction than have adjacent lowland areas; increasing habitat conversion for timber and charcoal extraction, cattle-ranching and associated fires are principal current threats, although the species persists in partially degraded habitats such as abandoned mines.

Bibliography. Canevari *et al.* (1991), Collar & Andrew (1988), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Ferreira de Vasconcelos (1999), Ferreira de Vasconcelos & Lombardi (1996), Ferreira de Vasconcelos & Melo-Júnior (2001), Ferreira de Vasconcelos, Maldonado-Coelho & Buzzetti (2003), Ferreira de Vasconcelos, Maldonado-Coelho & Durães (1999), Hellmayr (1906a, 1906b), Meyer de Schauensee (1982), Parker *et al.* (1996),

de la Peña & Rumboll (1998), Ridgely & Tudor (1994), Sick (1993, 1997), da Silva (1995), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Traylor (1977), Willis & Oniki (1991), Zimmer (1955b).

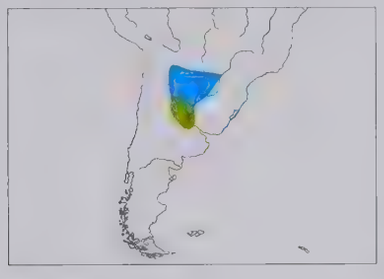
Genus *PSEUDOCOLOPTERYX* Lillo, 1905

71. Dinelli's Doradito

Pseudocolopteryx dinelliana

French: Doradite de Dinelli **German**: Dinellisumpftyrann **Spanish**: Doradito Tucumano
Other common names: Rufous-edged Pygmy-tyrant

Taxonomy. *Pseudocolopteryx dinellianus* Lillo, 1905, Tucumán, Argentina.
Possibly forms a superspecies with *P. acutipennis*. Monotypic.
Distribution. Very locally in N Argentina (NE Córdoba, Santiago del Estero, Tucumán); S Bolivia, Paraguay and SW Brazil (Mato Grosso do Sul) in non-breeding season.



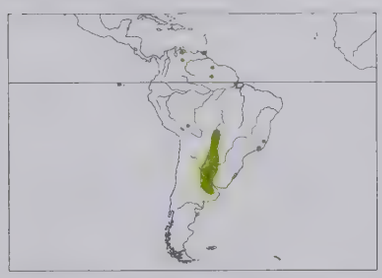
Descriptive notes. 11 cm. Plumage is yellowish-olive above, head with rufescent tinge on crown, lores and cheeks; wings more grey, wing-coverts and remiges narrowly edged with buff, modified primaries P6 and P7 narrow and lanceolate; entirely bright yellow below; iris dark brown; bill slender, parulid-like, black; legs blackish-grey. Differs from very similar *P. flaviventris* mainly in less brown upperparts, more rufescent lores and cheeks. Female is slightly duller than male. Juvenile undescribed. VOICE. Soft but twangy "redek-redek-redidek", or "zeik-zeik".
Habitat. Reedbeds, grassy marsh vegetation, and adjacent shrubs; to 500 m.
Food and Feeding. Little known. Forages deep inside marsh vegetation, perch-gleaning insects and spiders.
Breeding. Sept-Apr. Presumably has aerial display (suggested by presence of modified primaries), but not yet documented. Nest a deep cup constructed of vegetable fibres and spider oothecae, lined with feathers, attached to marsh vegetation or in fork of low shrub within marsh. Clutch 3 eggs; incubation and fledging periods not recorded.
Movements. Migratory; moves to extreme S Bolivia and W Paraguay during austral winter (Apr-Aug).
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Not well known; apparently rare to locally common. More or less common in its major stronghold in Bañados del Río Dulce and Laguna de Mar Chiquita Natural Park; occurs also in the unprotected Bañados de Figueroa (Santiago del Estero) and Bañado La Estrella (Formosa). No recent records from Tucumán. Canalization and other modifications may adversely affect its wetland habitats, and savanna-type habitat probably under pressure from agricultural expansion. Nevertheless, extensive areas of suitable habitat remain in both its breeding and its non-breeding ranges (e.g. Estancia San Antonio Private Nature Reserve and Tacuara National Park, both in Paraguay), and population seems relatively stable.
Bibliography. Bornschein (2000), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), David & Gosselin (2002b), Di Giacomo (2004), Dinelli (1933), Hayes (1995), Joseph (1996), Laubman (1934), Lowen *et al.* (1996), Meyer de Schauensee (1982), Molli (1985), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores & Yzurieta (1980, 1991), Nores *et al.* (1983), Olrog (1979a), de la Peña (1988, 1997), de la Peña & Rumboll (1998), Ridgely & Tudor (1994), Short (1975), Stattersfield & Capper (2000), Stotz *et al.* (1996), Traylor (1977), Wege & Long (1995).

72. Crested Doradito

Pseudocolopteryx sclateri

French: Doradite de Sclater **German**: Schopfsumpftyrann **Spanish**: Doradito Copetón

Taxonomy. *Anaeretes sclateri* Oustalet, 1892, Chile; error = Buenos Aires, Argentina.
Isolated N populations described as race *striaticeps* on basis of pale lower mandible, but this evidently a trait of immature. Monotypic.
Distribution. Isolated populations in Venezuela, Trinidad and Guyana; also N Bolivia, S & SE Brazil, Paraguay and E Argentina.



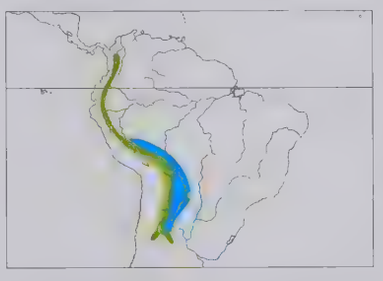
Descriptive notes. 11 cm; 7-8 g. Pronounced shaggy crest unique within genus. Male has entire upperparts, including crown, pale olive, elongated crown feathers blackish with yellowish-white edges, semi-concealed yellow crownstripe, subtle dusky streaks on back; cheeks dusky; wings pale olive, two wingbars and edges of tertials dull whitish, modified primaries P6 and P7 with incised and attenuated vanes; chin and entire underparts bright yellow; iris dark brown; bill thin, narrow, parulid-like, black; legs black, hallux nail unusualy long and sharp. Female is duller yellow, black crest more broadly edged pale yellow (less contrast with crown), rest of head paler, slight supercilium very pale yellow, primaries normal, lower mandible pinkish-orange. Juvenile resembles female, but shorter crest has more ochre, less black, underparts very pale. VOICE. Song of S populations composed of sharp introductory bill-snaps ("tsik") followed by 3 gentle, high-pitched, squeaky notes with a bill-snap interspersed, "tsik, tsik, tsik, tsee-tsik-tsee-lee"; in N, song reported as "tsik-tsik-tsee-lee", the "tsik" most likely also bill-snaps; call note a high, thin, soft "sik".
Habitat. Reeds, marshes, and tall thin grass near water; to c. 500 m.
Food and Feeding. Insects and spiders. Often seen in pairs or in small family groups of up to four individuals. Moves among vegetation by clinging to sides of sedge or reed stems; occasionally emerges briefly and perches high over reeds to view surroundings more broadly. Feeds by perch-gleaning in marshy vegetation, sedges (Cyperaceae), low growth at borders of lagoons, and tall weeds, especially *Polygonum* and water hyacinth (*Eichhornia*).
Breeding. Sept-Jan in S; adults with begging juveniles in Jun in N. Nest in S a deep cup made of grass, little lining but profusely filled with coccoons and spider oothecae, attached to vertical stems over water, in SE Brazil (Rio Grande do Sul) 35 cm over water; in Trinidad similar nest but without oothecae; a pair observed during final stages of building in Paraguay, only female seen to collect and weave material, followed closely by male throughout process, nest a thin hemispherical cup, final dimensions 7·5-9 cm high (lowest on entrance side), 3·5-5·5 cm deep, outside diameter 6·1 cm, inside diameter 2·4 cm, made of fine wiry brown rootlets of dried aquatic plant (c. 80% of mass), coarse, dry sedge stems and grass panicles up to 80 mm long and 1·5 mm across, dry weight 2·25 g, outer surface and especially rim covered profusely with sulphur-yellow and whitish spider oothecae and ochraceous lepidopteran coccoons, no well-differentiated lining except for few macerated grass blades and flattened oothecae, rim woven tightly around vertical stems in clump of sedge along wall of taller reedbed, concealed from one side, suspended over water. Male produces loud wing "whirr", most likely with incised primaries. Clutch 2 eggs in S; incubation and fledging periods not documented.
Movements. Resident. In past, was thought to be an austral migrant.
Status and Conservation. Not globally threatened. Not well known; apparently very local, but sometimes quite common. Found to be fairly common in Aug at PVR estancia near Beni Biosphere Reserve, in Bolivia; in Argentina, a fairly common breeder in San Juan de Poriahú Private Reserve (in Iberá Provincial Reserve), in Corrientes, and two areas near Laguna de Mar Chiquita, in NE Córdoba.
Bibliography. Babarskas *et al.* (2003), Bostwick & Zyskowski (2001), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Di Giacomo (1992, 2004), Dubs (1992), ffrench (1991), Hayes (1995), Herklots (1961), Hilty (1999, 2003), Klimaitis & Moschione (1987), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1987, 1988, 1997), de la Peña & Rumboll (1998), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Temple (2002), Traylor (1977), Wetmore (1926).

73. Subtropical Doradito

Pseudocolopteryx acutipennis

French: Doradite à ailes pointues **Spanish**: Doradito Oliváceo
German: Olivgrüner Sumpftyrann

Taxonomy. *Hapalocercus acutipennis* P. L. Sclater and Salvin, 1873, "Peruvia alta", Bogotá trade skin, Colombia.
Possibly forms a superspecies with *P. dinelliana*. Individuals from S part of range appear to be larger than those in N; further study needed. Monotypic.
Distribution. Very locally in Andes from Colombia (C & E cordilleras) S to NW Argentina; also lowlands in W Paraguay, and scattered records from lowlands of SE Peru and NE & E Bolivia.



Descriptive notes. 11 cm; 7-8 g. Male is uniformly bright olive-green above, with elongated crown feathers forming short, shaggy crest; wings olive-brown, feathers lightly edged with grey, in some specimens median and greater wing-coverts tipped dull cinnamon (two wingbars), modified primaries P6 and P7 incised and attenuated; tail bright olive-green; bright golden-yellow below; iris dark brown; bill slender, parulid-like, black; legs dark grey. Distinguished from *P. flaviventris* by brighter olive upperparts, brighter yellow underparts, no rufescent tone on crown. Female lacks incised outer primaries. Immature has pale base of lower mandible, more prominent buffy wingbars. VOICE. A series of buzzy, irregularly produced introductory notes followed by short nasal snort, "tzit-tzit-tzit t-konk"; call note while foraging "tzit".
Habitat. Reedbeds, marshes, moist sedge (Cyperaceae) pastures, and brush near water on hills and mountains in subtropical zones of Andes; less frequently in fields and tall grassy areas. In breeding season, at 2200-3550 m; not recorded above 700 m outside breeding season.
Food and Feeding. Insects. Forages singly or in family groups, usually remaining low and quiet under cover, occasionally perching atop grassy vegetation. Perch-gleans and hover-gleans from tips of grass.
Breeding. Dec-Apr in Bolivian highlands. Wing "whirr" during brief flight display, most likely produced by incised primaries. Deep cup-nest made of grass or other vegetable fibre, lined with feathers, placed among marsh vegetation. Clutch 3 eggs; incubation and fledging periods not recorded.
Movements. Many populations appear to be migratory. Birds from Argentina and Bolivia move N along Andes and to adjoining Amazonian lowlands and Paraguayan Chaco; strictly a non-breeding visitor (May-Aug) in Bolivian and Peruvian lowlands.
Status and Conservation. Not globally threatened. Rare in N part of range, red-listed in Colombia ("vulnerable") and Ecuador ("near-threatened"); fairly common farther S, e.g. in Argentina (Salta and Tucumán). Rarity in N most likely due to drainage and intensive grazing. Occurs in Tambopata-Candamo Reserved Zone, in Peru; has been recorded once in La Florida Park, near Bogotá, in Colombia.
Bibliography. Allen (1995), Bostwick & Zyskowski (2001), Cadena (2002a), Canevari *et al.* (1991), Chapman (1921), Chesser (1997), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Flores & Capriles (1998), Greenfield (2002), Hayes (1995), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Navas (2002), Nores *et al.* (1983), Parker (1982), de la Peña (1988), de la Peña & Rumboll (1998), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Short (1975), Stotz *et al.* (1996), Zimmer (1930, 1940b).

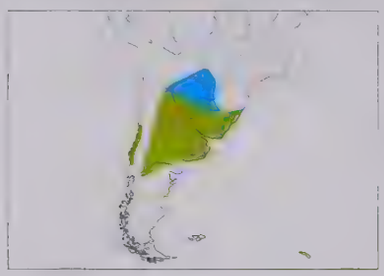
74. Warbling Doradito

Pseudocolopteryx flaviventris

French: Doradite babillarde **German**: Braunrücken-Sumpftyrann **Spanish**: Doradito Común

Taxonomy. *A[lecturus] flaviventris* d'Orbigny and Lafresnaye, 1837, Corrientes, Argentina.
Chilean birds may be slightly larger in size than those elsewhere in range; further study needed. Monotypic.

Distribution. Breeds C Chile (Santiago S to Valdivia), N & E Argentina (S to Chubut and Buenos Aires), Uruguay and SE Brazil (Rio Grande do Sul); in non-breeding season N to Paraguay.



Descriptive notes. 11 cm; 8 g. Male is dull olive-brown above, crown rufescent, lores and cheeks dusky; wings like back, wing-coverts and flight-feathers narrowly tipped and edged buffy; tail dusky olive-brown; entirely bright yellow below, brightest on throat; iris medium brown; bill very slender, black; legs dark grey. Female is like male, but base of lower mandible pale flesh-coloured. Juvenile is duller throughout, edges of wing feathers buffy, underparts bright buffy, somewhat greyer on throat and creamy yellow on belly. VOICE. A series of gentle and somewhat disjointed-sounding, high-pitched, staccato and squeaky notes, mechanical introduction followed by set of 4-8 more musical notes, "chek, chek, chek, chek-chick-chick-chiquetik" or "tk tk tk tk tk quít tuk péét tk-tuk, tk-quít", head snapping sharply upwards with each double note; "tek" call while foraging.

Habitat. Reedbeds, freshwater marshes, sawgrass (*Cortaderia*) marshes, and surrounding riparian vegetation; also cornfields and weed patches during migration. Sea-level to 500 m.

Food and Feeding. Insects. Forages alone or in pairs or family groups, mostly deep inside marsh vegetation; shy and inconspicuous. Mainly perch-gleans, occasionally makes short sallies into open air.

Breeding. Sept-Jan. Nest a loosely woven cup of fine straw or rush fibres attached to vertical marsh vegetation. Clutch 2-4 eggs; no information on incubation and fledging periods.

Movements. Populations breeding in extreme S migrate into N part of range in austral winter; Chilean birds apparently cross Andes to spend non-breeding season in Argentina. Vagrants recorded in Paraguay and Bolivia.

Status and Conservation. Not globally threatened. Uncommon to locally fairly common; generally commoner in Argentina than in Chile.

Bibliography. Aguirre (1997), Araya & Chester (1993), Babarskas *et al.* (2003), Belton (1985), Bostwick & Zyskowski (2001), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Di Giacomo (2004), Fjeldså & Krabbe (1990), García & Vilina (1994), Gore & Gepp (1978), Harris (1998), Hayes (1995), Jaramillo (2003), Johnson (1967), Joseph (1996), Klimaitis & Moschione (1987), López (1997), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Navas & Bó (2001), Nores *et al.* (1983), de la Peña (1987, 1988), de la Peña & Rumboll (1998), Ridgely & Tudor (1994), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Udvardy (1963), Weske (1972), Wetmore (1926).

Genus *PSEUDOTRICCUS*

Taczanowski & Berlepsch, 1885

75. **Bronze-olive Pygmy-tyrant**

Pseudotriccus pelzelni

French: Tyranneau bronzé **German**: Bronzeolivtyrann **Spanish**: Tiranuelo Bronceado

Taxonomy. *Pseudotriccus pelzelni* Taczanowski and Berlepsch, 1885, Machay and Hacienda Mapoto, Tungurahua, Ecuador.

Forms a superspecies with *P. simplex*, and possibly conspecific. Races *berlepschi* and *annectens* intergrade on WC Colombian slopes. Four subspecies recognized.

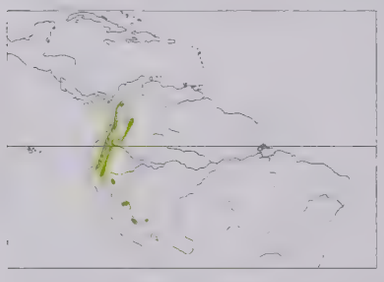
Subspecies and Distribution.

P. p. berlepschi Nelson, 1913 - E Panama and NW Colombia (E to W Caldas).

P. p. annectens (Salvadori & Festa, 1899) - SW Colombia and NW Ecuador.

P. p. pelzelni Taczanowski & Berlepsch, 1885 - E Andes of Colombia and E Ecuador.

P. p. peruvianus Bond, 1947 - locally in E Andes of Peru (San Martín S to Cuzco).



Descriptive notes. 11-11·5 cm; 9-11 g. Tiny, dark pygmy-tyrant of subtropical forest undergrowth. Nominate race is entirely dark brownish-olive above, crown slightly darker than back, longer and broader crown feathers forming bushy crest (rarely raised); wings as back, wing-coverts and inner remiges diffusely edged warmer brown; tail as back; chin and throat creamy whitish, breast and flanks olive, belly and undertail-coverts creamy yellow; iris dark red to reddish-brown; bill black; legs grey. Sexes alike. Juvenile undescribed. Race *berlepschi* is darker and more brown above, crown blacker, wing-coverts more conspicuously edged rufous-brown, underparts paler yellow, bill larger; *annectens* is like previous, but back more bronze than dark brownish, crown greener, auriculars and neck brownish with bronzy cast, brighter yellow underparts, yellower cast to olive flanks; *peruvianus* resembles nominate but more green, less brownish, wing-coverts lack brownish edges. VOICE. Not very vocal; makes 4-6 short, wheezy "piff" notes c. 1 second apart, song a thin high-pitched trill; snaps bill repeatedly when alarmed.

Habitat. Humid montane forest, cloudforest; 300-2500 m.

Food and Feeding. Insects. Forages alone or in pairs, just above ground in dense forest undergrowth, perching on both vertical and horizontal twigs; flies with short bursts from perch to perch (audible whirring wing noise with each flight). Prey captured with short upward strikes; bill snapped audibly as bird strikes leaf and prey.

Breeding. Birds with enlarged gonads in May in Colombia. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Fairly common to common; often overlooked unless mist-netted. Fairly common on Cerro Pirre and Cerro Tacarcuna (both in Darién), in Panama; occurs also in Tambito Nature Reserve, in Colombia, and Manta Real (designated for protected status), near Guayaquil, in Ecuador. Probably locally extinct in areas where deforestation has been intense, e.g. in Colombian Andes.

Bibliography. Angehr *et al.* (2004), Anon. (1998a), Chapman (1917c), Cory & Hellmayr (1927), Cracraft (1985), Delgado (1985), Eisenmann (1955), Freile & Chaves (2004), Hilty (1997), Hilty & Brown (1986), Lanyon (1988a, 1988b), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), Salaman (1994), Stotz *et al.* (1996), Strewe (2000b), Terborgh (1971), Traylor (1977), Traylor & Fitzpatrick (1982), Williams & Tobias (1994).

76. **Hazel-fronted Pygmy-tyrant**

Pseudotriccus simplex

French: Tyranneau à front brun **German**: Roststirntyrann **Spanish**: Tiranuelo Simple

Taxonomy. *Caenotriccus simplex* Berlepsch, 1901, Sandillani, La Paz, Bolivia.

Forms a superspecies with *P. pelzelni*, and possibly conspecific. Monotypic.

Distribution. SE Peru (Madre de Dios, Puno) and NW Bolivia (La Paz, Cochabamba).



Descriptive notes. 11-11·5 cm; 9-11 g. Tiny, dark pygmy-tyrant with bronzy forecrown, of subtropical forest undergrowth. Has forecrown, lores, eyering and side of head strongly tinged dull rufous; otherwise entirely dark brownish-olive above, crown slightly darker than back, longer and broader crown feathers forming bushy crest (rarely raised); wings as back, wing-coverts and inner remiges diffusely edged warmer brown to rufous; tail as back; chin and throat creamy whitish, breast and flanks olive, belly and undertail-coverts creamy yellow; iris dark red to reddish-brown; bill black; legs grey. Sexes alike. Juvenile has less rufous on forecrown, is brighter yellow below. VOICE. Not very vocal; makes several wheezy "piff" notes c. 1 second apart, song a thin high-pitched trill; snaps bill repeatedly when alarmed.

Habitat. Humid montane forest, dense cloudforest; 1100-2100 m.

Food and Feeding. Arthopods. In stomach contents from SE Peru 29 prey items identified, including homopteran bugs (planthoppers, 29%), coleopterans (21%), hymenopterans (wasps 14%, ants 17%), arthropod eggs (10%), other arthropods (9%). Forages alone or in pairs, just above ground in dense forest undergrowth, perching on both vertical and horizontal twigs; flies with short bursts from perch to perch (audible whirring wing noise with each flight). Prey captured with short upward strikes; bill snapped audibly as bird strikes leaf and prey.

Breeding. Birds with gonads enlarged in Aug-Sept in Peru. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Restricted-range species; present in Bolivian and Peruvian Lower Yungas EBA. Uncommon; not well known. Occurs in Madidi National Park, in Bolivia. Forests in lower Yungas of Peru and Bolivia have been extensively converted for agriculture, especially cultivation of cash crops such as coca and coffee; several large protected areas have, however, been established, including Tambopata-Candamo Reserved Zone, in Peru.

Bibliography. Begazo (1995), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Hennessey & Gómez (2003), Hennessey, Herzog & Sagot (2003), Lanyon (1988a, 1988b), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977), Zimmer (1940a).

77. **Rufous-headed Pygmy-tyrant**

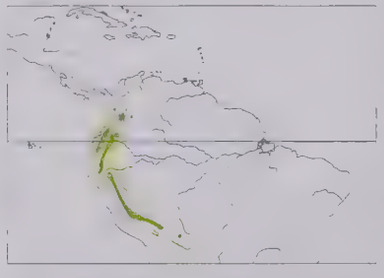
Pseudotriccus ruficeps

French: Tyranneau à tête rousse **German**: Rotkopftyrann **Spanish**: Tiranuelo Cabecirrojo

Taxonomy. *Musicapa* [*sic*] *ruficeps* Lafresnaye, 1843, "Bogota", Colombia.

Formerly placed in a monotypic genus, *Caenotriccus*. Monotypic.

Distribution. Colombia (locally in C & E Andes, also W slope in N & S) S to Ecuador (S to Cotopaxi) on W slope and to Bolivia (La Paz, Cochabamba) on E slope.



Descriptive notes. 11 cm; 7-9 g. Distinctive chestnut-headed pygmy-tyrant. Has entire head and throat bright orange-rufous; upperparts dark olive; wings dark dusky, all feathers broadly edged dull chestnut, giving fully chestnut-winged appearance (browner C Peru); tail dull chestnut; breast and flanks greyish-olive, centre of belly and undertail-coverts creamy yellow; iris dark brown; upper mandible black, lower mandible mostly yellowish; legs grey. Sexes alike. Juvenile is mostly dark olive, wings rufous-brown, chin whitish, head brownish-olive; head acquires rufous feathers of adult gradually, beginning with forehead. VOICE. Loud, explosive buzzy trill lasting several seconds, "tzzzzzzzzzzzzeuw", sometimes ending with a snap; song a bright, more protracted, higher-pitched version, first descending and then ascending; often snaps bill repeatedly.

Habitat. Humid montane forest, dense cloudforest, vine thickets, and forest borders; mainly 1850-3350 m, down to 400 m in SW Colombia (Nariño).

Food and Feeding. Insects. Forages alone or in groups of 2-4 individuals, usually near ground in dense forest undergrowth, perching on both vertical and horizontal twigs, sometimes landing briefly on ground; flies with short bursts from perch to perch. Prey captured with short, explosive upward strikes; bill snapped audibly as bird strikes leaf and prey.

Breeding. Fledglings in Jun in Colombia and Jul-Mar in E Peru. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to common; rare in Bolivia. Fairly common in Serranías Cofán (Sucumbíos), in Ecuador; occurs also in Tambito Nature Reserve, in Colombia, Podocarpus National Park and Guandera Biological Reserve, in Ecuador, and Machu Picchu Historical Sanctuary, in Peru. Probably locally extinct in areas where deforestation has been intense, e.g. in SW Ecuador.

Bibliography. Allen (1998), Baez *et al.* (1997), Chapman (1917c, 1921), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Hennessey, Herzog & Sagot (2003), Hilty & Brown (1986), Lanyon (1988a, 1988b), Meyer de Schauensee (1982), Remsen (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996), Terborgh (1971), Traylor (1977), Traylor & Fitzpatrick (1982), Walker (2001), Williams & Tobias (1994), Zimmer (1940a).

PLATE 21 ➤



PLATE 21

inches 2

cm 5

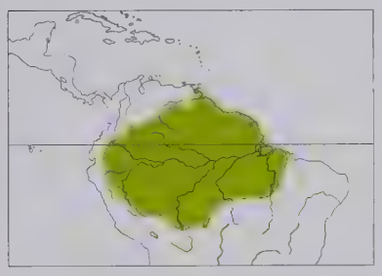
Genus *CORYTHOPIS* Sundevall, 1836

78. **Ringed Antpipit**

Corythopis torquatus

French: Corythopis à collier **Spanish**: Mosquero Terrestre Norteño
German: Nördlicher Brustbandtyrann

Taxonomy. *Corythopis torquata* Tschudi, 1844, Chanchamayo Valley, Junín, Peru.
Genus was for long placed in the family Formicariidae or together with the gnateaters (*Conopophaga*) in the Conopophagidae; numerous anatomical, behavioural and genetic characters, however, indicate affinities within present family, probably closest to *Pseudotriccus*. This species forms a superspecies with *C. delalandi*; the two are possibly conspecific, but differ vocally, also slightly in plumage, and ranges apparently overlap in C Brazil (upper R Xingu drainage). Races intergrade broadly, and individual variation pronounced; proposed race *subtorquatus* described from two specimens (one of each sex) from Amazon region of N Bolivia, but indistinguishable from nominate in scrutiny of larger series of specimens from same region and adjacent SE Peru. Three subspecies recognized.
Subspecies and Distribution.
C. t. sarayacuensis Chubb, 1918 - Amazon Basin in SE Colombia, E Ecuador and NE Peru.
C. t. anthoides (Pucheran, 1855) - Amazon and S Orinoco Basins in S Venezuela, the Guianas and Brazil (E to N Maranhão, S to N Goiás, N Mato Grosso and Rondônia).
C. t. torquatus Tschudi, 1844 - Amazon Basin in EC & SE Peru, W Brazil and N Bolivia.



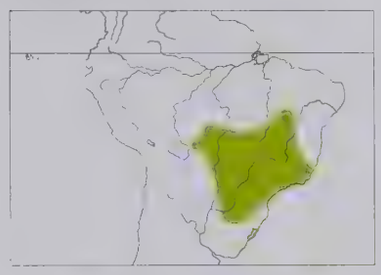
Descriptive notes. 13·5-14 cm; 15-18 g. Distinctive, ground-walking tyrannid of the forest floor. Nominate race has rather dull greyish-brown crown, faint whitish loral and postocular spots; upperparts, including wings and tail, dark brownish-olive; face pale greyish-olive, chin and throat white; underparts white, flanks suffused greyish-olive, bold broad black streaks beginning in almost solid necklace on upper breast and extending most heavily down flanks, unmarked on belly and undertail-coverts; wing-linings dark greyish; iris medium brown, grey-brown or grey; upper mandible blackish, lower mandible pale flesh-coloured with yellow to pinkish-orange near base; legs very long, pale grey to pinkish-grey. Sexes similar, female smaller than male. Juvenile has fewer, paler and more brownish breast streaks. Races *sarayacuensis* is on average smaller than nominate, crown colour same as back; *anthoides* is also smaller, crown slate-grey. Voice. Most commonly a deliberately delivered, descending, clear 2-note whistle, "peeew prayeur", second note rising and then falling below pitch of first, sometimes in series of more than two; often snaps bill during foraging, and especially when startled.
Habitat. Humid tropical evergreen forest, both *terra firme* and seasonally flooded forest or swamp-forest, less commonly in mid-successional river-margin forest. Sea-level to 1400 m, mostly below 500 m. Less often in second growth than *C. delalandi*.
Food and Feeding. Arthropods; occasionally lizards and frogs. Of 61 prey items found in analysis of stomach contents from SE Peru, beetles (Coleoptera) formed 40%, hymenopterans 27% (ants 20%, wasps 7%), homopteran bugs 8%, lepidopteran larvae 8%, arachnids 5%, frogs 3%, other 9%. Forages alone. Walks with steady gait, one foot ahead of other, along dark forest floor, peering mainly upwards, occasionally springing up to strike at prey on leaf undersides 10-20 cm overhead, with loud bill-snap at each attempt.
Breeding. Birds in breeding condition in Apr-May in S Venezuela, Nov-Dec in E Amazonian Brazil and Aug-Dec in SE Peru. Nest a large, moss-covered, oven-shaped dome 12 cm high, 13 cm long, side entrance 5·5 cm across, nest-chamber made with fine plant fibres and rhizomorphs, 9·5 cm deep, built atop base of leaf detritus on forest floor. Clutch 2 eggs; incubation period not documented; nestling period 13 days; one member of pair often calling nearby while other enters nest.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Occurs in many national parks and other protected areas throughout its reasonably large range. Much of this species' habitat remains in relatively pristine condition, and it is not considered likely to become threatened in near future.
Bibliography. Allen (1995), Ames (1971), Ames *et al.* (1968), Bates & Parker (1998), Begazo (1995), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Fitzpatrick (1980c, 1981, 1985b), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Kirwan & Sharpe (1999), Meyer de Schauensee (1982), Oniki & Willis (1980, 1983b), Oren & Parker (1997), Peres & Whittaker (1991), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977), Traylor & Fitzpatrick (1982), Willard *et al.* (1991).

79. **Southern Antpipit**

Corythopis delalandi

French: Corythopis de Delalande **Spanish**: Mosquero Terrestre Sureño
German: Südlicher Brustbandtyrann
Other common names: Delalande's Antpipit

Taxonomy. *Muscicapa delalandi* Lesson, 1830, Rio de Janeiro, Brazil.
Genus was for long placed in the family Formicariidae or together with the gnateaters (*Conopophaga*) in the Conopophagidae; numerous anatomical, behavioural and genetic characters, however, indicate affinities within present family, probably closest to *Pseudotriccus*. This species forms a superspecies with *C. torquatus*; the two are possibly conspecific, but differ vocally, also slightly in plumage, and ranges apparently overlap in C Brazil (upper R Xingu drainage). Monotypic.
Distribution. E Bolivia (E Santa Cruz), S Brazil (S Mato Grosso, S Goiás, S Maranhão, Minas Gerais and Espírito Santo S to NW Rio Grande do Sul), E Paraguay and NE Argentina (Misiones, NE Corrientes).



Descriptive notes. 13·5-14 cm, 14-18 g. Distinctive, ground-walking tyrannid of the forest floor. Has olive upperparts, crown slightly greyer, faint whitish loral and postocular spots; wings and tail same colour as back; face pale greyish-olive, chin and throat creamy white; underparts white, flanks suffused greyish-olive, bold broad black streaks beginning in almost solid necklace on upper breast and extending most heavily down flanks, unmarked on belly and undertail-coverts; wing-linings white; iris medium to dark brown; upper mandible blackish, lower mandible pale flesh-coloured with yellow to pinkish-orange near base, mouth-lining yellow-orange; legs very long, pale greyish-flesh. Differs from *C. torquatus* in being paler and less olive above, chin and throat more creamy, wing-linings white (not dark greyish). Sexes alike. Juvenile resembles adult. Voice. Most commonly a deliberately delivered, descending, clear 6-note whistle, "peee prayeur, pi-pi-peepit?"; often snaps bill during random foraging, and especially when startled.
Habitat. Humid tropical lowland forest and secondary woodland; sea-level to 1000 m, mainly below 800 m. Found more frequently in second growth and small forest patches than *C. torquatus*.
Food and Feeding. Arthropods; occasionally lizards and frogs. One stomach contained six beetles (of family Tenebrionidae). Forages alone; does not accompany mixed-species flocks. Walks with steady gait, one foot ahead of other, along dark forest floor, peering mainly upwards, occasionally springing up to strike at prey on leaf undersides 10-20 cm overhead, with loud bill-snap at each attempt.
Breeding. Birds in breeding condition in Nov in Bolivia and Oct-Dec in Argentina. Nest a well-camouflaged oven-shaped dome, 8·4 cm high, 15·6 cm long, entrance hole 3·7 × 3·2 cm, on forest floor; three distinct layers, with base an unorganized heap of dried leaf detritus 0·5-2 cm deep, interior chamber 7·6 cm high woven of fine plant fibres (especially from small palm *Euterpes edulis*) 1-2·5 cm thick, and irregular outer covering 0·5- 1·5 cm thick mainly of live green moss with added leaves and dried material. Clutch 2-3 eggs, laid every other day; incubation period not recorded; chicks fed by both adults, fledge after 14 days, remain with parents for at least a further 18 days.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common. Occurs in several protected areas, including Caaguazú, San Rafael, San Luis and Ybycuí National Parks, all in Paraguay, and Brasília, Iguaçu and Serra da Canastra National Parks and Mata dos Godoy State Park (Paraná), all in Brazil. Rather tolerant of disturbed habitats, and found even in small and seriously degraded forest fragments.
Bibliography. Ames (1971), Ames *et al.* (1968), Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Cory & Hellmayr (1927), Darrieu (1987), Hayes (1995), Lanyon (1988b), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Olrog (1979a), de la Peña (1988), Ridgely & Tudor (1994), do Rosário (1996), Saibene *et al.* (1996), Sick (1993, 1997), Simon & Pacheco (1996), Stotz *et al.* (1996), Traylor (1977).

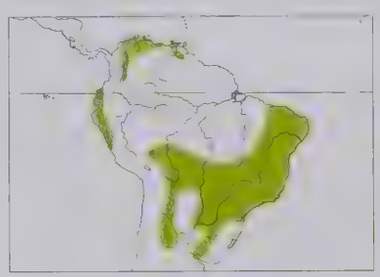
Genus *EUSCARTHMUS* Wied, 1831

80. **Tawny-crowned Pygmy-tyrant**

Euscarthmus meloryphus

French: Tyranneau à huppe fauve **Spanish**: Tiranuelo Copetón
German: Graubrust-Zwergtyrann

Taxonomy. *E[uscarthmus] meloryphus* Wied, 1831, Vale Fundo, southern Bahia, Brazil.
Genus once placed in the family Formicariidae because of odd tarsal scutellation; affinities within present family uncertain. Three subspecies recognized.
Subspecies and Distribution.
E. m. paulus (Bangs, 1899) - NE Colombia and N Venezuela (E to Sucre, S to NE Bolívar).
E. m. fulviceps P. L. Sclater, 1871 - W & SE Ecuador (S from Manabí, including coastal islands, also S Zamora-Chinchipe) and W & N Peru (Tumbes S to Lima, also arid Marañón Valley in Cajamarca, Amazonas and La Libertad).
E. m. meloryphus Wied, 1831 - E Brazil (Maranhão and Ceará S to Mato Grosso and Rio Grande do Sul), E Peru (E Puno), E Bolivia (S from Pando), N & E Paraguay, NW & NE Argentina (S to Tucumán and, in E, to Córdoba and N Buenos Aires) and Uruguay.



Descriptive notes. 10-10·5 cm; 7 g. Tiny, peculiar pygmy-tyrant with bushy bright rufous crown. Nominate race has lores and indistinct eyering dull buffy to whitish; drab brownish above, crown feathers slightly elongated around a large rufous coronal patch (semi-concealed); wings plain dusky brown, wing-coverts tipped rufous, edges of remiges indistinctly rufous; tail dusky; face buffy brown, throat and breast greyish-white, side of breast and flanks tinged brownish, rest of underparts creamy yellow; iris medium brown to chestnut; upper mandible black, lower mandible greyish or flesh-coloured; legs dark grey. Female is slight-

On following pages: 81. Rufous-sided Pygmy-tyrant (*Euscarthmus rufomarginatus*); 82. Grey-and-white Tyrannulet (*Pseudelaenia leucospodia*); 83. Lesser Wagtail-tyrant (*Stigmatura napensis*); 84. Greater Wagtail-tyrant (*Stigmatura budytoides*); 85. Paltry Tyrannulet (*Zimmerius vilissimus*); 86. Venezuelan Tyrannulet (*Zimmerius improbus*); 87. Bolivian Tyrannulet (*Zimmerius bolivianus*); 88. Red-billed Tyrannulet (*Zimmerius cinereicapilla*); 89. Mishana Tyrannulet (*Zimmerius villarejoi*); 90. Slender-footed Tyrannulet (*Zimmerius gracilipes*); 91. Golden-faced Tyrannulet (*Zimmerius chrysops*); 92. Peruvian Tyrannulet (*Zimmerius viridiflavus*).

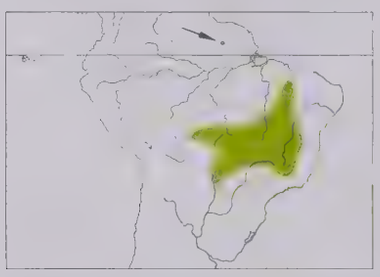
ly smaller than male. Juvenile resembles adult. Race *paulus* has head side tinged fulvous to buffy, tail on average shorter; *fulviceps* has conspicuous bright buffy face and forecrown tinged rufescent, crown patch smaller, two prominent buffy wingbars. Voice. Distinctively noisy; dry, unmusical "plee-plit-irick" endlessly repeated, sometimes with several introductory "plee" notes before the staccato portion; often sings through heat of day from deep inside dense shrubs, reminiscent of cicada (Cicadidae) or locust (Locustidae).
Habitat. Arid lowland and montane scrub, overgrazed pastures with scattered dense bushes, dry weedy fields and waste areas, shrubby thickets, and dry forest edge. Sea-level to 2100 m where habitat permits, mostly below 1500 m; colonizes tropical zones following deforestation.
Food and Feeding. Insects. Forages alone, very near ground in densest shrubs; often extremely difficult to see. Moves actively from perch to perch, making short upward strikes and hover-gleans.
Breeding. Feb-May (after rainy season) in W Ecuador and Oct-Dec in Argentina. Weak open cup-nest of dead grass and plant stems, outside diameter 5·5 cm, height 4 cm, cup depth 3 cm, slung between thin twigs and plant stems in thick shrub, so thin that contents visible from outside. Clutch 2 eggs, laid with interval of 1day; incubation period 14-15 days; nestling period 11-12 days; adults frequently call from near or in nest.
Movements. Mainly resident; populations in extreme S appear to be present only during breeding season, suggesting some migration to N.
Status and Conservation. Not globally threatened. Fairly common to common. Occurs in many protected areas, including at least a dozen national parks and similar reserves, throughout its large range. Thrives in secondary and converted habitats; benefits from forest clearance, successfully colonizes resultant scrub habitat.
Bibliography. Babarskas *et al.* (2003), Belton (1985), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Darrieu (1987), Di Giacomo (2004), Dubs (1992), Euler (1900), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Hudson (1920), Lanyon (1988b), Lowen *et al.* (1996), Marchant (1960), Narosky & Salvador (1998), de la Peña (1987, 1988, 1996), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), do Rosário (1996), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Wetmore (1926), Williams & Tobias (1994), Zimmer (1940b, 1955b).

81. **Rufous-sided Pygmy-tyrant**

Euscarthmus rufomarginatus

French: Tyranneau à flancs roux **Spanish**: Tiranuelo Flanquirrufo
German: Weißkehl-Zwergtyrann
Other common names: Rufous-edged Pygmy-tyrant

Taxonomy. *Hapalocercus rufomarginatus* Pelzeln, 1868, Calção de Couro and Rio das Pedras, São Paulo, Brazil.
Genus once placed in the family Formicariidae because of odd tarsal scutellation; affinities within present family uncertain. Proposed race *savannophilus* (Surinam) considered inseparable from other populations. Monotypic.
Distribution. Very locally in S Surinam (Sipaliwini), E & C Brazil (Amapá, and from E Maranhão and S Piauí S to S Mato Grosso, Mato Grosso do Sul, N São Paulo and Minas Gerais, and E to C Bahia), extreme NE Bolivia (Serranía de Huanchaca) and extreme NE Paraguay (Zanja Morotí, in Concepción).



Descriptive notes. 11 cm; 6 g. Has short whitish supercilium, thin eyering; uniform brown above, semi-concealed crown patch cinnamon-rufous; wings darker brown, wing-coverts tipped ochraceous (two distinct wingbars), inner remiges narrowly edged ochraceous; tail long, dusky, edged ochraceous; face light brown, throat white, underparts pale yellow, side of breast and flanks deeply warm ochraceous buff; iris dark brown; upper mandible black, lower mandible flesh-coloured; legs dark grey. Sexes alike. Juvenile undescribed. Voice. Distinctive, unmusical "tic" notes followed by a buzz, "tic, tic, tic, tiker-trrrrrk", also a longer series of buzzes ending with emphatic note, "trrrrrika", in response to playback; sings from tops of low shrubs and small trees, both members of pair may sing in antiphonal duet. Buzzy trills also as alarm.
Habitat. Restricted to pristine *campo* and *campo-cerrado*, and tall shrubby grassland; possibly also in bamboo-dominated scrub as a refuge after fire. Up to 1000 m.
Food and Feeding. Arthropods; also regularly small fruits. Forages in pairs, within a few centimetres of ground in grass and low shrubs, occasionally down to ground, but usually perching on grass stalks and low shrubs; often jerks tail upwards like a wren (Troglodytidae). Makes short sallies to glean arthropods.
Breeding. Not documented.
Movements. Resident.
Status and Conservation. VULNERABLE. Rare and local; more common at a couple of localities. Species was probably once widespread within its large range of c. 2,000,000 km², but now irregularly recorded at a few scattered areas. Isolated N population in the 1000-km² Sipaliwini Savanna Nature Reserve, in S Surinam, where fairly common, and one recent record from EMBRAPA Experimental Station, in N Brazil (Amapá). In N Bolivia substantial population remains in Serranía de Huanchaca, within Noel Kempff Mercado National Park, where extensive areas (c. 3000-5000 km²) of *campo* and *cerrado* are probably largest tracts of pristine habitat remaining, and 4 pairs/0·3 km² suggest that this population may number thousands; also common E of Riberalta, in Beni, but in only one of several grassland patches, and was fairly common along the Riberalta-Guayamirim road, in Santa Cruz. In C Brazil, recent records from sites in Mato Grosso, Mato Grosso do Sul, Bahia, Distrito Federal and Minas Gerais. Habitat loss probably the principal reason for its current rarity. By 1993, two-thirds of *cerrado* region in C Brazil had been heavily or moderately altered, with most conversion for eucalypt (*Eucalyptus*) and pine (*Pinus*) plantations, livestock farming, and large-scale cultivation of soybeans, rice and other exportable crops having occurred since 1950, encouraged by government land-reform measures; was presumed extinct in São Paulo (no records since 1821) until rediscovered in 1993 in Itirapina State Ecological Station. Away from protected areas there are few undisturbed areas left, and these could soon be degraded by spreading fires and overgrazing, or be lost entirely through agricultural conversion. Recent surveys in Brazil have revealed very few additional populations, e.g. in Brasília, Chapada Diamantina, Chapada dos Veadeiros and Chapada dos Guimarães National Parks, Mangabeiras Park (one record in 1989, none more recently), Serra das Araras Ecological Station, Chapada do Catuni (Minas Gerais), and at a site 170 km W of Correntina (Bahia); the species is, however, often absent in apparently suitable habitat, e.g. in Das Emas and Serra da Canastra National Parks, suggesting that there are other, as yet unknown reasons for its rarity.
Bibliography. Bates & Parker (1998), Bates, Parker *et al.* (1992), Bates, Stotz & Schulenberg (1998), Cavalcanti (1999), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Cracraft (1985), Dubs (1992), Haffer (1974), Haverschmidt & Mees (1994), Hayes (1995), Mees (1968), Meyer de Schauensee (1982), Neto & Ramos (2001), Parker & Willis (1997), Ridgely & Tudor (1994), Sick (1993, 1997), da Silva *et al.* (1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Teixeira *et al.* (1991), Wege & Long (1995), Willis & Oniki (1988c, 1990).

Genus *PSEUDELAENIA* W. E. Lanyon, 1988

82. **Grey-and-white Tyrannulet**

Pseudelaenia leucospodia

French: Tyranneau gris et blanc **German**: Weißkronentyrann **Spanish**: Mosquerito Blanquigrís
Other common names: Ash-coloured Tyrannulet

Taxonomy. *Elaenia leucospodia* Taczanowski, 1877, Tumbes, Peru.
Genus hypothesized to be very close to *Stigmatura* on basis of numerous cranial and syringeal characters. Species was previously placed variously in *Elaenia*, *Myiopagis* and *Phaeomyias*. Birds from SW Ecuador sometimes separated as race *cinereifrons*, but considered probably indistinguishable from others. Monotypic.
Distribution. Arid Pacific slope and coast of W Ecuador (I de la Plata, off Manabí, also Puna I and W Guayas, S Loja) and NW Peru (S to La Libertad).



Descriptive notes. 12·5 cm; 10-11 g. Has white supraloral line; uniform pale greyish-brown above, large white coronal patch (semi-concealed), surrounding crown feathers slightly elongated and often parted into bifurcated crest; wings dusky, wing-coverts and flight-feathers narrowly edged whitish; tail grey; face greyish-white, entire underparts whitish, tinged grey on flanks and creamy on belly; iris dark brown; bill brownish-black, lower mandible broadly flesh-coloured at base, mouth-lining pink; legs grey. Sexes similar. Juvenile has less white in crown. Voice. Simple, short "chevit" or "chevit-chit".
Habitat. Arid scrub, brushy riparian thickets, dry arroyos and streambeds; sea-level to 800 m, mostly below 500 m.
Food and Feeding. Insects. Forages singly or in pairs, near tops of shrubs. Actively moves about with horizontal posture, tail often cocked above horizontal; perch-gleans and hover-gleans from vegetation; occasionally wags tail slowly.
Breeding. Feb-Apr, after rainy season; often two broods. Nest a beautifully neat, deep, barrel-shaped cup felted all over with soft plant down, no additional lining, supporting twigs sometimes exposed at base of cup, placed 2-7 m above ground on smooth branch (or where smaller twig inserts into large one) near centre of thick shrubby tree; nest sometimes reused for second brood, same nest tree used over several years. Clutch usually 3 eggs, occasionally 2; incubation period 16 days; nestling period 15-17 days.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tumbesian Region EBA. Uncommon to locally fairly common or common. In Ecuador, abundant on I de la Plata (off Manabí) and fairly common on Santa Elena Peninsula (Guayas). Occurs in Northwest Peru Biosphere Reserve, in Peru. Arid habitats within Tumbesian region are adversely affected by cattle grazing and agriculture in valley bottoms, but in general remain in reasonable condition.
Bibliography. Best & Clarke (1991), Butler (1979), Cory & Hellmayr (1927), Cracraft (1985), Lanyon (1988b), Marchant (1960), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977), Zimmer (1941b).

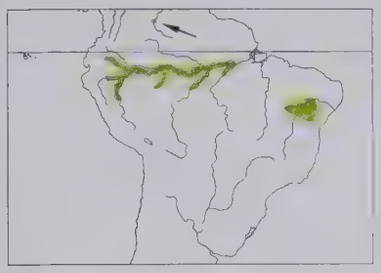
Genus *STIGMATURA* P. L. Sclater & Salvin, 1866

83. **Lesser Wagtail-tyrant**

Stigmatura napensis

French: Calandrite du Napo **Spanish**: Rabicano Menor
German: Nördlicher Stelzentachurityrann

Taxonomy. *Stigmatura budytoides napensis* Chapman, 1926, junction of rivers Curaray and Napo, Peru.
Genus was formerly placed in the family Formicariidae because of its general resemblance to *Formicivora*. Forms a superspecies with *S. budytoides*. Two subspecies recognized.
Subspecies and Distribution.
S. n. napensis Chapman, 1926 - along larger rivers of C Amazonian and SW Orinoco drainages in extreme SE Colombia (near Leticia), SW Venezuela (along R Orinoco), E Ecuador, NE Peru and NC Brazil (E to R Tapajós).
S. n. bahiae Chapman, 1926 - NE Brazil (Pernambuco, NC Bahia).
Descriptive notes. 13 cm; 9·1-10·5 g. Distinctive tyrannid of Amazonian river islands. Nominate race has narrow pale yellow supercilium from bill to behind eye, indistinct pale yellow eyering, blackish eyeline; greyish-olive above, wings dusky, median and greater wing-coverts broadly white (forming broad longitudinal wing patch), edges of innermost remiges broadly white; tail long, dusky, slightly graduated, outermost three feather pairs with broad white oval shape at tips, outer rectrices with white outer web and broad yellowish-white basal band, latter usually extending to tail base; face pale yellowish, throat and entire underparts medium yellow, slight olive to greyish-



olive tinge across breast; iris dark brown; bill long, black; legs black. Distinguished from extremely similar *S. budytoides* mainly by slightly smaller size, usually white on tail base, no dark postocular patch. Sexes similar, female slightly smaller than male. Juvenile not described. Race *bahiae* has brownish upperparts, somewhat buffy underparts. VOICE. Soft, whistled "wheeert?" or "weeeéé" and harsh, descending rattle; partners often engage in animated, syncopated duet, one member singing "pfew skew" as other sings a more rattling "du' u'u", both flipping wings and tail upwards and forwards with each call.

Habitat. Early-successional vegetation, especially newly forming beaches with thick *Tessaria* and tall grasses, on islands along large rivers; also arid scrub in NE Brazil. To 300 m, occasionally to 500 m.

Food and Feeding. Insects. Forages in pairs or family groups. Moves actively, with short pauses; tail usually held cocked above horizontal, constantly fanned (exposing broad white tips and yellowish base) and pumped up over back, while wings slightly drooped. Perch-gleans and makes sallies to hover-glean from leaves, twigs and bark in shrubs.

Breeding. Not documented.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to locally fairly common. In Ecuador, apparently common on R Napo upstream to La Selva Lodge and on lower R Aguarico (below Lagartacocha).

Bibliography. Cory & Hellmayr (1927), Hilty (1999, 2003), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Zimmer (1940b).

84. **Greater Wagtail-tyrant**

Stigmatura budytoides

French: Calandrite bergeronnette **Spanish**: Rabicano Mayor
German: Südlicher Stelzentachurityrann

Taxonomy. *C[ulicivora] budytoides* d'Orbigny and Lafresnaye, 1837, Valle Grande, Santa Cruz, Bolivia. Genus was formerly placed in the family Formicariidae because of its general resemblance to *Formicivora*. Forms a superspecies with *S. napensis*. Four subspecies recognized.

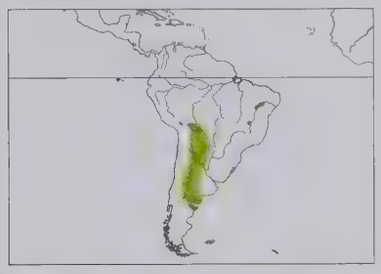
Subspecies and Distribution.

S. b. budytoides (d'Orbigny & Lafresnaye, 1837) - NC Bolivia (Cochabamba, W Santa Cruz, N Chuquisaca).

S. b. inzonata Wetmore & J. L. Peters, 1923 - SE Bolivia, W Paraguay and NW Argentina (Jujuy E to Chaco, S to Córdoba and San Luis).

S. b. flavocinerea (Burmeister, 1861) - C Argentina (Mendoza, Córdoba and Buenos Aires S to Chubut).

S. b. gracilis J. T. Zimmer, 1955 - E Brazil (Pernambuco, N Bahia, possibly S Piauí; recently recorded in Minas Gerais).



Descriptive notes. 14·5-16 cm; 8·5-13·2 g (highland populations significantly larger). Distinctive tyrannid with long, graduated tail broadly tipped white. Nominate race has broad bright yellow supercilium from bill to well behind eye, blackish eyeline; greyish-olive above, wings dusky, median and greater wing-coverts broadly white (forming broad longitudinal wing patch), edges of innermost remiges broadly white, outer three primaries slightly narrowed; tail very long, dusky, slightly graduated, outer 3-4 pairs of rectrices with broad white oval at tips, outer web and broad basal band of outer rectrices white, base of tail blackish; face yellowish, auriculars dusky, throat and entire underparts bright yellow, slight buffy tinge across breast; iris dark brown; bill long, black; legs black. Sexes similar, female slightly smaller than male. Juvenile undescribed. Races vary in size (nominate largest) and in coloration and pattern: *inzonata* is paler yellow below with barely discernible buffy wash on breast, basal white band on rectrices smaller (but highly variable); *flavocinerea* has even paler yellow underparts, is more greyish (less olive) above, wing edgings greyer and less conspicuous, supercilium more whitish, rectrices with smaller apical spots and no white basal tailband; *gracilis* is significantly smaller than all other races, plumage resembles nominate. VOICE. Abrupt "churt", sometimes in series, varied occasionally into more complex chatter; partners often engage in distinctive, syncopated, animated duet, singing "whidididiteh" or "tri-ti-treeowhit" over and over, flipping wings and tail upwards and forwards with each call, and swivelling body.

Habitat. Arid scrub, deciduous woodland, Chaco woodland, and dry gallery forest; mainly sea-level to 1000 m, but to 2700 m in arid regions of Bolivian Andes.

Food and Feeding. Insects. Forages in pairs or family groups, from near ground to tops and outer foliage of tall shrubs, in open to dense vegetation, occasionally to ground or atop logs. Moves actively, with short pauses; tail usually held cocked above horizontal, constantly fanned (exposing broad white tips) and pumped up over back, while wings slightly drooped. Perch-gleans and makes sallies to hover-glean from leaves, twigs and bark. Gives audible wing-whir display while foraging in pairs.

Breeding. Oct-Dec in Argentina. Nest an open cup made of plant fibres and rootlets, bonded with spiderwebs, placed 1-2 m above ground on horizontal branch within dense shrub or small tree; favours thorny shrubs such as acacia (*Acacia*) and chañar (*Geoffroea*) where available. Clutch 2 eggs, laid with interval of 1 day; incubation 14-15 days; fledging 12 days.

Movements. S populations in Argentina believed to migrate to N portion of range during austral winter, but extent and geographical pattern of movements not clear.

Status and Conservation. Not globally threatened. Fairly common to common. Recent range extension S in E Brazil; race *gracilis* recorded in Minas Gerais (left bank of R São Francisco), where apparently rather common. No current risks identified.

Bibliography. Canevari *et al.* (1991), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Flores & Capriles (1998), Hayes (1995), Kirwan *et al.* (2004), Lanyon (1988b), Meyer de Schauensee (1982), Mezquida (2002), Miserendino (1998), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Navas & Bó (2001), Nores *et al.* (1983), Ordano (1998b), de la Peña (1987, 1988, 1997), Ridgely & Tudor (1994), Ridgway (1907), Schmitt *et al.* (1997), Schönwetter & Meise (1968), Short (1975), Sick (1993, 1997), Smith (1971), Stotz *et al.* (1996), Traylor (1977), Traylor & Fitzpatrick (1982), Wetmore (1926), Zimmer (1955b).

Genus *ZIMMERIUS* Traylor, 1977

85. **Paltry Tyrannulet**

Zimmerius vilissimus

French: Tyranneau gobemoucheron **Spanish**: Mosquerito Centroamericano
German: Weißstreif-Kleintyrann
Other common names: Mistletoe Tyrannulet

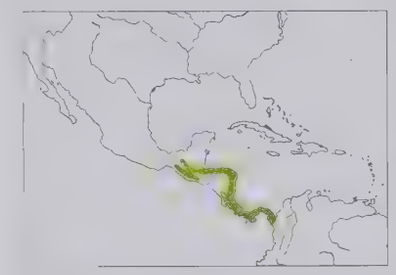
Taxonomy. *Elainia vilissima* P. L. Sclater and Salvin, 1859, Cobán, Guatemala.

Despite superficial resemblance to *Phyllomyias*, genus appears to be more closely related to *Phylloscartes*. Previously considered conspecific with *Z. improbus*, but differs in plumage, voice and habitat. Race *parvus* possibly a separate species; further study required. Two subspecies recognized.

Subspecies and Distribution.

Z. v. vilissimus (P. L. Sclater & Salvin, 1859) - S Mexico (Chiapas), S Guatemala and W El Salvador; also numerous sight records from Belize.

Z. v. parvus (Lawrence, 1862) - Honduras and E Nicaragua S to Panama and extreme NW Colombia (NW Chocó).



Descriptive notes. 10 cm. Small, short-tailed tyrannulet. Nominate race has broad white supercilia meeting above bill; crown dark brownish-grey, upperparts bright olive; wings dusky, wing-coverts, inner remiges and proximal parts of outer remiges edged bright yellow ("wedge" of dark remiges separating inner secondaries and primaries); tail dusky olive; throat and lower face whitish, auriculars olive; breast pearly grey, flammulated with darker grey or brownish, flanks and undertail-coverts yellow-green, heavily flammulated with olive, belly white; iris dull yellow to pale sandy brown; bill small and rounded, black; legs black. Sexes similar, female significantly smaller than male. Juvenile has dark brown eyes, less contrast between crown and back. Race *parvus* is significantly smaller than nominate, but remarkably variable in size (smaller in lowland Honduras and Nicaragua than in highlands of Costa Rica and Panama), has paler, greyish crown, narrower white supercilia, yellower edgings on wing feathers, only faint flammulations on breast and flanks. VOICE. Persistent series of whistled "pee-areet" or "pyeu" notes uttered at intervals of several to many seconds.

Habitat. Humid montane forest, forest borders, tall second growth with clearings, and shrubby pastures with scattered trees. Recorded from near sea-level to 2600 m; nominate race mainly 500-2600 m but descends from higher elevations in winter; *parvus* mainly below 500 m in Honduras and Nicaragua, to 2600 m in Costa Rica and Panama.

Food and Feeding. Insects; mistletoe (Loranthaceae) and other small berries regularly eaten. Forages singly or in pairs, often following mixed-species flocks in forest mid-storey and canopy. Actively hops and flits about in outer foliage, perching with horizontal posture, tail often cocked slightly above horizontal; perch-gleans and sally-gleans.

Breeding. Feb-May. Nest a globular mass of rootlets and moss, set in mossy tangle or epiphyte. Clutch 2 eggs; incubation and fledging periods not documented.

Movements. Resident; many descend to lower elevations in winter.

Status and Conservation. Not globally threatened. Fairly common to common. Especially common in W Chiriquí highlands, in Panama. Occurs in Columbia River Forest Reserve, in Belize, and in Rancho Naturalista, Río Negro Jaguar Reserve, Tapantí National Park and Tarcol Lodge, all in Costa Rica. Considered to be one of the most important dispersers of seeds for a number of plant species of humid forest.

Bibliography. Anon. (1998a), Beavers *et al.* (1991), Blake (1958), Cory & Hellmayr (1927), Davidar (1987), Dickey & van Rossem (1938), Fjeldså & Krabbe (1990), Hilty & Brown (1986), Howell & Webb (1995a), Land (1970), Lanyon (1988b), Lee Jones (2004), Lee Jones *et al.* (2000), Meyer de Schauensee (1982), Moermond (1985), Monroe (1968), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Skutch (1960, 1985), Slud (1960, 1964), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Thurber *et al.* (1987), Traylor (1977, 1982), Wetmore (1941, 1972), Willis (1980), Willis & Eisenmann (1979), Wood *et al.* (1986), Zimmer (1941b).

86. **Venezuelan Tyrannulet**

Zimmerius improbus

French: Tyranneau trompeur **Spanish**: Mosquerito Venezolano
German: Küstenkordilleren-Kleintyrann

Taxonomy. *Tyranniscus improbus* P. L. Sclater and Salvin, 1871, Mérida, Venezuela.

Despite superficial resemblance to *Phyllomyias*, genus appears to be more closely related to *Phylloscartes*. This species was formerly placed in a separate genus, *Tyranniscus*, but exhibits plumage and morphological features (wing pattern, proportionally long tail and bill, and derived characters of both syrinx and palate) typical of present genus. Previously considered conspecific with *Z. vilissimus*, but differs in plumage, voice and habitat. Three subspecies recognized.

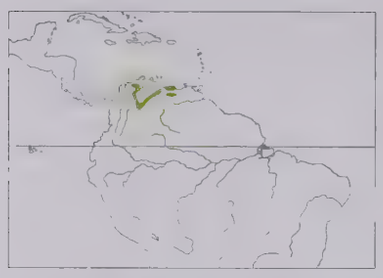
Subspecies and Distribution.

Z. i. improbus (P. L. Sclater & Salvin, 1871) - N Colombia (Norte de Santander) and NW Venezuela (Táchira, Mérida, Barinas).

Z. i. tamae (Phelps, Sr & Phelps, Jr, 1954) - N Colombia (Santa Marta Mts) and W Venezuela (Sierra de Perijá and Paramo de Tamá, in Táchira).

Z. i. petersi (Berlepsch, 1907) - N Venezuela from S Lara E to Miranda.

Descriptive notes. 11·5 cm; 10-11 g. Nominate race has sharply defined, curved white supercilium contrasting with brown immediately anterior to eye, white partial lower eyering; crown dark brown, upperparts olive; wings dusky, wing-coverts, inner remiges and proximal parts of outer remiges nar-



rowly edged yellow-green ("wedge" of dark feathers between coverts and remiges); tail dusky olive; auricular patch dark brown, contrasting sharply with white throat; breast flammulated olive-grey, flanks olive to olive-grey, belly medium to bright yellow; iris dark brown; bill small and rounded, black; legs black. Sexes similar, female slightly smaller and shorter tailed than male. Juvenile undescribed. Race *tamae* differs only slightly from nominate, being slightly paler yellow below; *petersi* is distinctive, with grey or greyish-brown crown, dark grey auricular patch, pure grey breast, white belly. Voice. Distinctive, loud series of 3-4 sad-sounding, slightly descending whistled notes, each slightly lower-pitched than preceding one, "wheeyr-wheeyr-wheeyr-wheeyr", given only sporadically, separated by long silences; also a duet, one bird giving single whistle, second answering with whistled series; call note a short, high-pitched buzz.

Habitat. Humid montane forest, forest borders, and tall second growth with clearings; mainly 1200-2400 m, but down to 400 m in coast range of N Venezuela, and up to 3000 m in Andes and Sierra de Perijá.

Food and Feeding. Insects, also regularly mistletoe (Loranthaceae) and other small berries. Forages singly or in pairs, often following mixed-species flocks in forest mid-storey and canopy. Actively hops and flits about in outer foliage, perching with horizontal posture, tail often cocked slightly above horizontal; perch-gleans and sally-gleans.

Breeding. Birds in breeding condition in Mar-Nov in Venezuela (Sierra de Perijá). No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to common. Although extensive forest cover survives in parts of its limited range, deforestation has been severe around residential areas, e.g. Caracas (Venezuela), as well as in many other areas.

Bibliography. Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1966), Ridgely & Tudor (1994), Stotz *et al.* (1996), Strewe & Navarro (2003), Traylor (1977), Zimmer (1941b).

87. Bolivian Tyrannulet

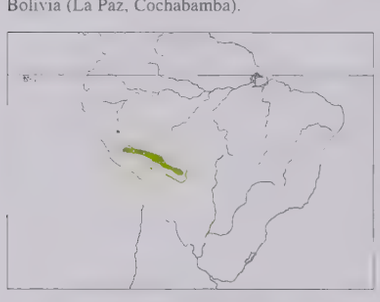
Zimmerius bolivianus

French: Tyranneau de Bolivie **German**: Olivkleintyrann **Spanish**: Mosquerito Boliviano

Taxonomy. *Muscicapara boliviana* d'Orbigny, 1840, Yungas, Bolivia.

Despite superficial resemblance to *Phyllomyias*, genus appears to be more closely related to *Phylloscartes*. Birds from C & S Peru named as race *viridissimus*, on average perhaps slightly yellower below than those in Bolivia, but individual and age-related variation in this character appears greater than any detectable geographical difference. Monotypic.

Distribution. E Andes from C Peru (Huanuco, N Ayacucho, Cuzco, Madre de Dios, Puno) S to N Bolivia (La Paz, Cochabamba).



Descriptive notes. 12 cm; 10-11·6 g. Exceedingly drab tyrannulet with no facial markings. Has crown, upperparts and face dark olive; wings dark dusky, wing-coverts, inner remiges and proximal parts of outer remiges narrowly edged bright yellow-green ("wedge" of dark remiges separating inner secondaries and primaries); tail dusky olive; throat whitish, breast greyish-olive to yellowish-olive, grading to pale yellow on belly and undertail-coverts; iris creamy white; bill small and rounded, black, lower mandible sometimes deep reddish, purple or grey; legs black. Sexes similar, female slightly smaller than male. Juvenile has reddish to brownish-red iris. Voice. A series of high, thin whistled notes, ascending and at end suddenly falling, "wheee, wheee, wheee, wheee-o", or simply 1-2 of the ascending notes without terminal syllable.

Habitat. Humid montane forest, including mossy cloudforest, also adjacent second growth and clearings; 1000-2830 m.

Food and Feeding. Insects; also small fruits, especially of mistletoe (Loranthaceae). Forages singly or in pairs in forest canopy; sometimes joins mixed-species flocks. Moves about actively, perch-gleaning and sally-gleaning.

Breeding. Not documented.

Movements. Resident.

Status and Conservation. Not globally threatened. Restricted-range species: present in Peruvian and East Andean Foothills EBA and Bolivian and Peruvian Lower Yungas EBA. Fairly common to common. Is easily found along the Shintuya-Paucartambo road in Cuzco (Peru) and in the Yungas of Bolivia; occurs also in Machu Picchu Historical Sanctuary, in Peru, and in all protected areas in the Yungas of La Paz and Cochabamba, in Bolivia.

Bibliography. Álvarez & Whitney (2001), Chapman (1921), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Hennessey & Gómez (2003), Hennessey, Herzog & Sagot (2003), Lanyon (1988b), Meyer de Schauensee (1982), Remsen *et al.* (1982), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Zimmer (1941b).

88. Red-billed Tyrannulet

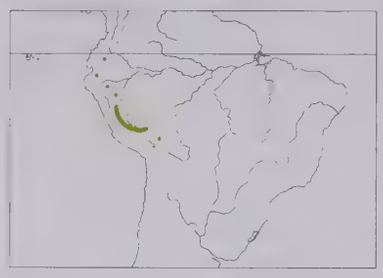
Zimmerius cinereicapilla

French: Tyranneau à bec rouge **Spanish**: Mosquerito Piquirrojo
German: Purpurschnabel-Kleintyrann

Taxonomy. *Phyllomyias cinereicapilla* Cabanis, 1873, Monterico, Ayacucho, Peru.

Despite superficial resemblance to *Phyllomyias*, genus appears to be more closely related to *Phylloscartes*. This species was formerly placed in a separate genus, *Tyranniscus*, but exhibits plumage and morphological features (wing pattern, proportionally long tail and bill, and derived characters of both syrinx and palate) typical of present genus. Monotypic.

Distribution. Locally in E Andean foothills in NC & SE Ecuador (W Napo, Zamora-Chinchipe), NC, C & SE Peru (Amazonas, San Martín, Junín and Ayacucho S to Cuzco and Madre de Dios) and N Bolivia (La Paz).



Descriptive notes. 11·5-12 cm; 11-13 g. Has short whitish supercilium, grey forehead, crown and lores, and dull olive upperparts; wings dusky, wing-coverts and proximal parts of flight-feathers narrowly edged yellow ("wedge" of dark remiges separating inner secondaries and primaries); tail dusky olive; face olive, throat narrowly whitish, upper breast olive-yellow, remaining underparts bright yellow; iris yellow; bill distinctive, rather large, upper mandible brownish, lower mandible purplish-red; legs grey. Sexes alike, female slightly smaller than male. Juvenile undescribed. Voice. Ascending series beginning and ending with more emphatic notes, including "wheet-wheet?" at end; also single soft "cheet".

Habitat. Humid montane and foothill forest, favouring edges and openings; 750-1350 m.

Food and Feeding. Insects; also small fruits, including those of mistletoes (Loranthaceae). Forages alone or in pairs, occasionally but not habitually following mixed-species flocks. Moves actively through dense outer vegetation in forest canopy, tail often held at or above horizontal, wings flicked occasionally; perch-gleans and hover-gleans.

Breeding. Not documented.

Movements. Resident.

Status and Conservation. Not globally threatened. Restricted-range species: present in Ecuador-Peru East Andes EBA and Peruvian and East Andean Foothills EBA. Rare to locally fairly common; often overlooked. Apparently rare, with disjunct range, in Ecuador; only one specimen, from W Napo, but observed a few times along road to Loreto N of Archidona and the Archidona Natural Reserve, and one reliable record from SE (lower Loja-Zamora road). More numerous in Peru. Sound recordings obtained from N Bolivia (Serranía de Establón, in La Paz). Many forests within the species' range are threatened by logging, mining, agriculture and road-building, but some large protected areas exist, including Podocarpus and Sangay National Parks, both in Ecuador; in Peru, Manu National Park and Biosphere Reserve and the Apurímac Reserved Zone also protect some of these forests.

Bibliography. Álvarez & Whitney (2001), Barnes *et al.* (1997), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Hennessey, Herzog & Sagot (2003), Lanyon (1988b), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Stotz *et al.* (1996), Traylor (1977), Zimmer (1941b).

89. Mishana Tyrannulet

Zimmerius villarejoi

French: Tyranneau de Villarejo **Spanish**: Mosquerito de Villarejo
German: Mishima-Kleintyrann
Other common names: Mishima Tyrannulet

Taxonomy. *Zimmerius villarejoi* Álvarez and Whitney, 2001, Allpahuayo-Mishana Reserve, south bank of River Nanay, 25 km WSW of Iquitos, Loreto, Peru.

Despite superficial resemblance to *Phyllomyias*, genus appears to be more closely related to *Phylloscartes*. This recently described species is apparently closest to *Z. cinereicapilla*. Monotypic.

Distribution. N Peru (near Iquitos, in N Loreto).



Descriptive notes. 10·5 cm; 6-7 g. Plumage is entirely greenish-olive above, paler green face, throat and upper breast contrasting only weakly with upperparts; wings dusky, wing-coverts edged and tipped yellow (two thin wingbars), inner remiges narrowly edged yellow; tail dusky, edged yellowish-olive; breast olive-yellow, remaining underparts bright yellow; iris creamy white; bill conical, upper mandible medium brownish, lower mandible dull pink, gape yellow; legs bluish-black, soles of feet yellowish. Sexes alike, female slightly smaller than male. Juvenile undescribed. Voice. Most commonly a closely spaced pair of thin, rising, whistled notes each 0·3 seconds in duration, sometimes given as single note or as triplet; also a more complex, multisyllabic, descending series; dawn song a simple series of 2-4 evenly spaced whistled notes, each progressively shorter than the preceding one.

Habitat. White-sand forest consisting of stunted, scrub-like trees and shrubs with canopy 12-18 m (*varillal*); indicator tree species include *Dicymbe uaiparuensis* (Facaceae) and several species of *Caraipa* (Clusiaceae). Lowlands.

Food and Feeding. Insects and, especially, small fruits; favours berries of mistletoe (Loranthaceae), seeds of which it regularly regurgitates and wipes on branches. Stomach contents revealed seeds of legumes and of the melastome *Miconia*. Forages singly or in pairs; rarely joins mixed-species flocks. Moves in canopy and subcanopy with short hops and flights; wings often flicked outwards, tail held downwards but occasionally flicked up towards horizontal. Food items obtained by sally-gleaning.

Breeding. No information.

Movements. Resident; highly sedentary within, and faithful to, small territories.

Status and Conservation. Not globally threatened. Described as recently as 2001; uncommon, has hitherto been found only at type locality of Allpahuayo-Mishana Reserved Zone, 25 km WSW of Iquitos (Loreto), where 1-3 individuals encountered per day; exact provenance of a single specimen labelled "Moybamba, Peru" is uncertain. Appears to be dependent on white-sand forest (*varillal*) in Amazonian Peru; Allpahuayo-Mishana encompasses 57,667 ha of this rare, endangered and fragile habitat. The species' tiny global range, coupled with continuing extraction of trees for building purposes, may threaten its survival. Moreover, a recent illegal invasion by a group of land speculators further threatens the integrity of the reserve, which has insufficient staff and finances to deal with the problem; several thousand hectares have already been destroyed. The few appropriate forests outside the reserve are unprotected and heavily exploited for timber, but future ecotourism and international funding for research and public-awareness campaigns may help with the protection of the reserve. Conservation status of this species needs to be assessed by official conservation bodies.

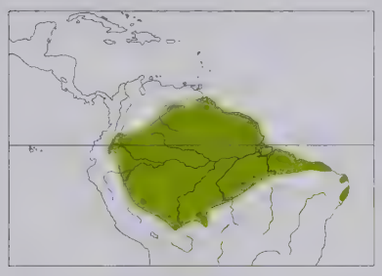
Bibliography. Álvarez & Whitney (2001), Anon. (2001f), Green (2002b), Lowen (2002b), Traylor (1977), Whitney & Álvarez (1998).

90. Slender-footed Tyrannulet

Zimmerius gracilipes

French: Tyranneau à petits pieds **Spanish**: Mosquerito Patifino
German: Schlankfuß-Kleintyrann

Taxonomy. *Tyranniscus gracilipes* P. L. Sclater and Salvin, 1868, Pebas, Peru.
Despite superficial resemblance to *Phyllomyias*, genus appears to be more closely related to *Phylloscartes*. This species was formerly placed in a separate genus, *Tyranniscus*, but exhibits plumage and morphological features (wing pattern, proportionally long tail and bill, and derived characters of both syrinx and palate) typical of present genus. Differences among named populations extremely subtle, apparently clinal, and recognizable only as population averages; on the other hand, apparent vocal differences across range imply that more than one taxon may be involved; further study required. Three subspecies recognized.
Subspecies and Distribution.
Z. g. gracilipes (P. L. Sclater & Salvin, 1868) - SE Venezuela (S Bolívar, Amazonas), extreme E Colombia (Vichada S to Amazonas), NW Brazil (Amazonas), E Ecuador and NE Peru (Loreto).
Z. g. acer (Salvin & Godman, 1883) - the Guianas and NE Brazil (E Amazonas E to Maranhão, Ceará and Alagoas).
Z. g. gilvus (J. T. Zimmer, 1941) - W & S Amazonian Brazil (Amazonas S to Rondônia and N Mato Grosso), C & SE Peru and N Bolivia (S to Cochabamba and N Santa Cruz).



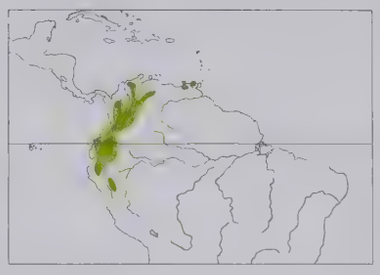
Descriptive notes. 10·5 cm; 6·5-9 g. Nominate race has narrow whitish supraloral stripe and short supercilium, dark eyestripe, grey forehead and crown, dull olive upperparts; wings dusky, wing-coverts and proximal parts of flight feathers narrowly edged yellow ("wedge" of dark remiges separating inner secondaries and primaries); tail dusky olive; throat and lower face yellowish-white, grading to dull olive-yellow on breast and yellow on belly; iris greyish; bill small and rounded, black; legs dark greyish. Sexes alike, female slightly smaller than male. Juvenile undescribed. Race *acer* has almost pure white face and lower throat, paler yellow underparts; *gilvus* has brighter yellow underparts. Voice. Most often heard is a single soft "chwit" or "what?" given from high in canopy, sometimes throughout day; also an ascending series of 4-5 short, slurred notes, "chu, chu-chu-ree" with abrupt rise at end; dawn song an often repeated "tu, de-de", first note descending, second and third notes much higher.
Habitat. Humid lowland evergreen forest and forest edge, and adjacent clearings; mostly below 500 m, but recorded to 850 m in SE Peru, occasionally higher (to 1200 m).
Food and Feeding. Insects; also small fruits, especially of mistletoe (Loranthaceae). Forages extremely high in forest canopy, thus difficult to observe; sometimes joins mixed-species flocks. Moves about actively, obtaining food items by perch-gleaning and sally-gleaning.
Breeding. Birds in breeding condition in Jun in S Colombia and Aug-Dec in SE Peru. Nest a rounded dome with a side entrance. Clutch 2 eggs; incubation and fledging periods not recorded.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to common; often overlooked, encountered mainly by voice. Occurs in many national parks and other protected areas throughout its reasonably large range, including Alto Orinoco-Casiquiare Biosphere Reserve, in Venezuela; Tinigua National Park, in Colombia; La Selva and Sacha Lodges, in Ecuador; Manu National Park and Biosphere Reserve, and Tambopata-Candamo Reserved Zone, in Peru; Madidi and Noel Kempff Mercado National Parks and Pilón Lajas Biosphere Reserve, in Bolivia; and some ten or more protected areas in Brazil. Much of this species' habitat remains in relatively pristine condition.
Bibliography. Allen (1995), Álvarez & Whitney (2001), Bangs & Penard (1918), Bates & Parker (1998), Beebe *et al.* (1917), Blake (1950), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Friedmann (1948), Gilliard (1941), Haffer (1997b), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Marchant (1960), Meyer de Schauensee (1982), Munn (1985), Oren & Parker (1997), Pacheco & Whitney (1995), Peres & Whittaker (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Roda & Carlos (2003), Schulenberg *et al.* (2001), Sick (1993, 1997), Silveira *et al.* (2003), Snethlage (1935), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992), Traylor (1977), Zimmer (1941b).

91. Golden-faced Tyrannulet

Zimmerius chrysops

French: Tyranneau à face d'or **Spanish**: Mosquerito Caridorado
German: Goldgesicht-Kleintyrann
Other common names: Loja Tyrannulet (*flavidifrons*)

Taxonomy. *Tyrannulus chrysops* P. L. Sclater, 1859, Zamora, Zamora-Chinchipe, Ecuador.
Despite superficial resemblance to *Phyllomyias*, genus appears to be more closely related to *Phylloscartes*. This species was formerly placed in a separate genus, *Tyranniscus*, but exhibits plumage and morphological features (wing pattern, proportionally long tail and bill, and derived characters of both syrinx and palate) typical of present genus. Often treated as conspecific with *Z. viridiflavus*, but separated on basis of plumage and voice. Races *albigularis* and *flavidifrons* possibly represent a separate species. Proposed race *molestus* (described from Cauca, in W Andes of Colombia) merged with nominate. Five subspecies recognized.
Subspecies and Distribution.
Z. c. minimus (Chapman, 1912) - N Colombia (Santa Marta Mts, N Magdalena).
Z. c. cumanensis (J. T. Zimmer, 1941) - NE Venezuela (Anzoátegui, Sucre, Monagas).
Z. c. chrysops (P. L. Sclater, 1859) - Sierra de Perijá and Andes of NW Venezuela, Colombia (except Nariño), E Ecuador and N Peru (S to San Martín).
Z. c. albigularis (Chapman, 1924) - SW Colombia (Nariño) and W Ecuador (S to Guayas).
Z. c. flavidifrons (P. L. Sclater, 1860) - SW Ecuador (SE Guayas S to W Loja).



Descriptive notes. 10·5-11·5 cm; 10·5 g. Brightly coloured tyrannulet with distinctively golden-yellow face and dark eyes. Nominate race has bright yellow forehead, supercilium and orbital region, bright olive upperparts; wings dusky, wing-coverts and flight-feathers edged bright yellow ("wedge" of dark remiges separating inner secondaries and primaries); tail dusky; throat and lower face yellowish-white, grading to dull whitish on breast, flanks and belly; iris brown; bill small and rounded, blackish; legs grey. Sexes alike, female slightly smaller than male. Juvenile undescribed. Races *albigularis* similar but slightly smaller and less yellow than nominate, with whitish throat; *flavidifrons* also has whitish throat, less extensive yellow on lores and forehead, generally darker and duller; *cumanensis* has underparts distinctly washed with pale greenish-yellow; *minimus* is considerably smaller than all others. Voice. Highly vocal, repeatedly uttering ringing whistled "pleeeeur" or "hueeer"; also ringing "teer-tif", especially at dawn, also plaintive "chu-dee-de-e-e", and slow "cheee cheee cheee" repeated 4-5 times; birds in SW Ecuador (*flavidifrons*) said to have dramatically different voice, a drawn-out "truuu-eeet".
Habitat. Humid montane forest, forest borders, older second-growth forest, and coffee plantations, also gardens; mainly 500-2000 m, and recorded to 2700 m. Usually replaced at higher elevations by *Z. improbus*.
Food and Feeding. Insects; regularly eats mistletoe (Loranthaceae) and other small berries. Forages singly or in pairs, often following mixed-species flocks in forest canopy. Actively hops and flits about in outer foliage, perching with horizontal posture, tail often cocked slightly above horizontal. Food items obtained by perch-gleaning and sally-gleaning.
Breeding. Prolonged nesting season, Apr-Nov in Colombia. Dome-shaped nest with side entrance, tucked into hanging moss 8-12 m above ground. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to common. Occurs in several protected areas, including e.g. Tambito Nature Reserve, in Colombia, Yacambú National Park, in Venezuela, Machalilla and Podocarpus National Parks, Loma Alta Ecological Reserve and Río Palenque Science Centre, all in Ecuador, and Northwest Peru Biosphere Reserve, in Peru.
Bibliography. Blake (1962), Chapman (1917c), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Haffer (1975), Hilty (1997, 2003), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1966), Miller (1963), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996), Strewe (2000b), Strewe & Navarro (2003), Traylor (1977), Williams & Tobias (1994), Zimmer (1941b).

92. Peruvian Tyrannulet

Zimmerius viridiflavus

French: Tyranneau à face jaune **German**: Gelbstreif-Kleintyrann **Spanish**: Mosquerito Peruano
Other common names: Tschudi's Tyrannulet

Taxonomy. *E[laenia] viridiflava* Tschudi, 1844, Tulumayo, Junín, Peru.
Despite superficial resemblance to *Phyllomyias*, genus appears to be more closely related to *Phylloscartes*. This species was formerly placed in a separate genus, *Tyranniscus*, but exhibits plumage and morphological features (wing pattern, proportionally long tail and bill, and derived characters of both syrinx and palate) typical of present genus. Often treated as conspecific with *Z. chrysops*, but separated on basis of plumage and voice. Monotypic.
Distribution. E Andes of C Peru (Huanuco, Junín, Ayacucho).



Descriptive notes. 12 cm; 9-10 g. Has pale yellow loral bands meeting narrowly over bill, pale yellow broken eyering, bright olive auricular patch washed with buff; bright olive above, crown darker olive to greyish-olive; wings dark dusky, wing-coverts, inner remiges and proximal parts of outer remiges conspicuously edged bright yellow-green ("wedge" of dark remiges separating inner secondaries and primaries); tail dusky olive; throat pale yellow, breast and flanks olive-yellow, flammulated with olive, belly bright yellow; iris grey to medium brown centrally, rimmed with tan; bill small and rounded, upper mandible grey to blackish, lower mandible medium grey; legs dark grey to black. Sexes alike. Juvenile undescribed. Voice. Rapid whistled phrase, "pee-diddle-wééo", delivered many times in succession.
Habitat. Humid montane forest and forest edge, occasionally in second growth; 1000-2500 m.
Food and Feeding. Insects; probably also mistletoe (Loranthaceae) and other small berries. Forages singly or in pairs, often following mixed-species flocks in forest canopy. Actively hops and flits about in outer foliage, perching with horizontal posture, tail often cocked slightly above horizontal. Food obtained by perch-gleaning and sally-gleaning.
Breeding. Not documented.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Northeast Peruvian Cordilleras EBA. Uncommon to fairly common. Fairly common in Cerros del Sira and Yanachaga-Chemillén National Park and along the Huánuco-Tingo María road in Carpish Mts, in Huánuco. Cordilleras in which this species occurs have suffered widespread deforestation resulting from agricultural expansion, especially in Marañón drainage; although cloudforests are still in relatively pristine condition, recent coca cultivation poses a threat.
Bibliography. Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Lanyon (1988b), Mee *et al.* (2002), Meyer de Schauensee (1966, 1982), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Stotz *et al.* (1996), Traylor (1977), Zimmer (1930, 1941b).

PLATE 22


inches 2
cm 5
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
ssp *purus*
ssp *ophthalmicus*
109
110
111
ssp *ottonis*
112
113
114
115

Genus *PHYLLOSCARTES*

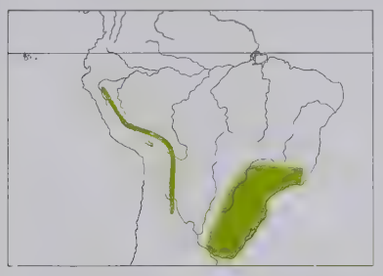
Cabanis & Heine, 1859

93. **Mottle-cheeked Tyrannulet**

Phylloscartes ventralis

French: Tyranneau ventru **German**: Olivgelb-Laubtyrann **Spanish**: Orejerito Oliváceo

Taxonomy. *Muscicapa ventralis* Temminck, 1824, Ipanema, São Paulo, Brazil.
Forms a superspecies with *P. flavovirens* and *P. virescens*, all formerly treated as conspecific; *P. kronei* and *P. beckeri* (both recently described) apparently belong with this group. Geographical differences minimal, and the maintaining of races perhaps unwarranted. Three subspecies recognized.
Subspecies and Distribution.
P. v. angustirostris (d'Orbigny & Lafresnaye, 1837) - E Andes from N Peru (San Martín) S to N Bolivia (La Paz, Cochabamba).
P. v. tucumanus J. T. Zimmer, 1940 - NW Argentina (Jujuy S to Tucumán and Catamarca).
P. v. ventralis (Temminck, 1824) - SE Brazil (Minas Gerais and Rio de Janeiro S to S Mato Grosso do Sul and Rio Grande do Sul), E Paraguay, NE Argentina (Misiones, Entre Ríos) and Uruguay.



Descriptive notes. 12 cm; 9 g. Nominate race is dark olive above, narrow short supercilium and eyering whitish (sometimes indistinctly so), dusky eyeline from lores through auriculars, sometimes extending to form shallow crescent at rear, dusky moustachial stripe; wings dusky, two pale yellow to yellow wingbars, yellow edges of flight-feathers, innermost remiges broadly tipped pale yellow on outer webs; tail dusky olive; throat whitish, lower face grizzled whitish; underparts medium yellow, faintly flammulated with olive on breast, belly medium yellow; iris dark brown; bill long and pointed, black, basal half of lower mandible flesh-coloured; legs grey. Sexes alike. Juvenile is duller than adult. Races vary in colour intensity: *angustirostris* is slightly darker green above and richer yellow below than nominate; *tucumanus* is slightly paler olive above, paler yellow below. Voice. Various short, rapid chatters of weak, reedy notes on same pitch, "chidit-it-it-it-it"; also slightly more deliberate "pst-pst-pst".
Habitat. Primarily montane evergreen forest from 1000 m to 2200 m in Andes, rarely above 1500 m in S Brazil; occasionally up to mossy, ridgetop cloudforest, or down to borders of upper tropical forest, treefall gaps and older second growth, rarely to scattered trees in forest clearings. In S part of range, also found in humid tropical forest, gallery forest, and temperate *Araucaria* and *Podocarpus* forests.
Food and Feeding. Arthropods. Stomach contents of specimens from SE Peru contained 52 identified items, of which beetles (Coleoptera) 64%, homopteran bugs 12%, arachnids (spiders) 6%, hemipterans 6%, hymenopterans 7% (ants 4%, wasps 3%), other arthropods 5%. Often forages alone or in pairs, and juveniles forage with parents for many months; also joins mixed-species flocks, but less regularly than do most other members of genus, and moves in and out of flocks. Forages very actively for insects in dense vegetation, mainly at middle and upper levels of humid forest, sometimes in forest understorey where sufficiently dense or low in stature; perches horizontally, carries tail nearly horizontal or slightly cocked, and holds or flicks wings slightly out from body; restless, rarely pauses for longer than 1-2 seconds. Makes short sallies to leaf surfaces to snatch or hover-glean prey, often at outer or terminal twigs and leaves. Changes of perch and sallies within vegetation often accompanied by audible wing-whirring.
Breeding. Oct-Dec in Argentina; juveniles in Nov in SE Peru. Nest in Argentina (race *tucumanus*) a closed ball, circular side entrance protected by short protruding canopy, all made of fibres and vine tendrils, dead leaves, lichens and moss, with mass of fibres protruding under opening, total dimensions 24 × 11 × 9·5 cm, attached below horizontal branch amid jumble of twigs; nest of race *angustirostris* had circular side entrance leading to vertical chamber 6 cm deep near top of bulky, hanging tangle made entirely of the epiphyte *Tillandsia usneoides* ("old man's beard"). Clutch 3 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to common. Occurs in a number of protected areas in most parts of range, including e.g. Machu Picchu Historical Sanctuary, in Peru, San Rafael and Ybycuí National Parks, in Paraguay, Itatiaia and Serra da Canastra National Parks and Serra Paranapiacaba International Biosphere Reserve, in Brazil, and Calilegua National Park, in Argentina.
Bibliography. Aspiroz (2001), Begazo (1995), Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Chapman (1921), Clay, Tobias *et al.* (1998), Cory & Hellmayr (1927), Cracraft (1985), Dabbene (1919), Dubs (1992), Ferreira de Vasconcelos (2001), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Gonzaga & Pacheco (1995), Hayes (1995), Klimaitis (1984), Klimaitis & Moschione (1987), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Raposo *et al.* (2002), Remsen & Traylor (1989), Ridgely & Tudor (1994), Saibene *et al.* (1996), Schulenberg *et al.* (2001), Sick (1993, 1997), Smyth (1928), Stotz *et al.* (1996), Traylor (1977), Weske (1972), Willis & Oniki (1992), Zimmer (1930, 1940b).

94. **Restinga Tyrannulet**

Phylloscartes kronei

French: Tyranneau de Krone **German**: Uferlaubtyrann **Spanish**: Orejerito de Restinga

Taxonomy. *Phylloscartes kronei* Willis and Oniki, 1992, Jardim Europa, Ilha Comprida, São Paulo, Brazil.
Recently described species, apparently belonging to a superspecies that also contains *P. ventralis*, *P. beckeri*, *P. flavovirens* and *P. virescens*; extremely similar to first of those, and possibly only a well-marked race of it, but the two have quite dissimilar voices and different habitats, and occur in close proximity to one another in SE Brazil. Monotypic.
Distribution. Coastal lowlands of SE Brazil from SE São Paulo (including lower banks of R Ribeira) S to Santa Catarina (Joinville).



Descriptive notes. 12 cm; 8-9 g. Plumage is greenish-olive above, slightly browner on crown, narrow supercilium and eyering yellow, dusky eyeline from lores and above auriculars extending at rear to form distinct dusky auricular crescent; face mottled dusky and yellowish; wings dusky, two wingbars and edges of flight-feathers pale yellow to yellow, innermost remiges broadly tipped pale yellow on outer web; tail dusky olive; lower face and throat pale yellow; underparts medium yellow, faintly flammulated with olive on breast, belly medium yellow; iris brown; bill thin and pointed, black, basal two-thirds of lower mandible whitish; legs grey. Sexes alike. Juvenile is duller than adult. Voice. Frequently repeated "feesee" or "plea", and twittering rapid song decribed as "sit-it-it-it-it-it it-sitit-sitit".
Habitat. Coastal sand-ridge and beach woodland (*restinga*); also found in second-growth habitats on same soil formations, and adjacent riverine forest, but only near sea-level.
Food and Feeding. Arthropods. Forages singly or in pairs; often joins mixed-species flocks containing parulids, tanagers (Thraupidae) and other tyrannids. Forages actively in outer foliage of small trees and bushes; tail carried nearly horizontal (not so highly cocked as in *P. ventralis*). Sallies short distances to leaf surfaces to snatch or hover-glean prey.
Breeding. Nest with two nestlings in Oct and family groups and dependent young observed in Dec suggest breeding season Sept-Dec. Nest oven-shaped, covered with lichen and moss, c. 13 cm wide and 16 cm high, placed 1·3 m off ground in small bush in swampy *restinga* vegetation.
Movements. Resident.
Status and Conservation. VULNERABLE. Restricted-range species: present in Atlantic Forest Lowlands EBA. Fairly common, but has relatively small range of c. 5500 km². Global population c. 2500-10,000 individuals. Pairs appear to maintain territories spaced only 100-200 m apart, suggesting density of 1 pair/ha. Threatened by ongoing coastal development, notably on Comprida I. for beachfront dwellings, with consequent extensive habitat loss leading to fragmentation and rapid decrease of its already small population; protection of habitat on Comprida, recently connected to mainland by a bridge, is urgently required if this species is to persist. Ribeira Valley is also rapidly losing its riverine forests and even second growth. Fires also a constant threat to suitable habitat. Occurs in Cananéia-Iguape-Peruíbe Environmental Protection Area, Ilha do Cardoso State Park (with little suitable habitat), Ilha do Superagüi National Park and Patrimônio Natural de Volta Velha Special Reserve.
Bibliography. Bencke *et al.* (2000), Clay, Tobias *et al.* (1998), Collar *et al.* (1994), Forrester (1993), Pacheco & Laps (2001), Remold & Ramos Neto (1995), Ridgely & Tudor (1994), do Rosário (1996), Stattersfield & Capper (2000), Stotz *et al.* (1996), Willis & Oniki (1992).

95. **Bahia Tyrannulet**

Phylloscartes beckeri

French: Tyranneau de Becker **German**: Bahialaubtyrann **Spanish**: Orejerito de Bahía

Taxonomy. *Phylloscartes beckeri* Gonzaga and Pacheco, 1995, Boa Nova, Bahia, Brazil.
Recently described species, apparently belonging to a superspecies that also contains *P. ventralis*, *P. kronei*, *P. flavovirens* and *P. virescens*; seems to be closest to first two of those. Monotypic.
Distribution. S Bahia, in E Brazil.



Descriptive notes. 12 cm; 7·5-9 g. Plumage is bright olive-green above, crown feathers greyish at centre; narrow supraloral stripe and eyering buffy, becoming creamy whitish behind eye; dusky eyeline from lores back to border of yellowish auriculars, extending to form indistinct auricular crescent; wings dusky olive, two wingbars and edges of flight-feathers pale yellow, innermost remiges edged and broadly tipped pale yellow on outer webs; tail dusky olive; throat and breast dirty whitish, flecked with pale yellow, rest of underparts medium yellow, faintly flammulated with olive on side of breast; iris dark brown; bill long and pointed, brown, lower mandible pearly whitish on basal two-thirds; legs pale grey. Sexes alike. Juvenile undescribed. Voice. Short, very soft "tik" contact calls between members of pair, and variable but equally soft, twittery song containing short trills.
Habitat. Primary forest and old secondary evergreen forest in highlands, at 750-1200 m.
Food and Feeding. Stomach contents of four specimens contained only insects. Forages actively in canopy and upper edges of tallest trees, almost always in company of mixed-species flocks. Scans leaf surfaces, often cocks tail to or above horizontal, including rapid flicking nearly to vertical; sallies to snatch or hover-glean insects from leaf surfaces.
Breeding. Not documented. Season probably Sept-Feb.
Movements. Resident.

On following pages: 96. Yellow-green Tyrannulet (*Phylloscartes flavovirens*); 97. Olive-green Tyrannulet (*Phylloscartes virescens*); 98. Ecuadorian Tyrannulet (*Phylloscartes gualaquizae*); 99. Black-fronted Tyrannulet (*Phylloscartes nigrifrons*); 100. Alagoas Tyrannulet (*Phylloscartes ceciliae*); 101. Rufous-browed Tyrannulet (*Phylloscartes superciliaris*); 102. Rufous-lored Tyrannulet (*Phylloscartes flaviventris*); 103. Cinnamon-faced Tyrannulet (*Phylloscartes parkeri*); 104. Minas Gerais Tyrannulet (*Phylloscartes roquettei*); 105. Bay-ringed Tyrannulet (*Phylloscartes sylviolus*); 106. Sao Paulo Tyrannulet (*Phylloscartes paulista*); 107. Oustalet's Tyrannulet (*Phylloscartes oustaleti*); 108. Serra do Mar Tyrannulet (*Phylloscartes difficilis*); 109. Variegated Bristle-tyrant (*Pogonotriccus poecilotis*); 110. Chapman's Bristle-tyrant (*Pogonotriccus chapmani*); 111. Marble-faced Bristle-tyrant (*Pogonotriccus ophthalmicus*); 112. Southern Bristle-tyrant (*Pogonotriccus eximius*); 113. Spectacled Bristle-tyrant (*Pogonotriccus orbitalis*); 114. Venezuelan Bristle-tyrant (*Pogonotriccus venezuelanus*); 115. Antioquia Bristle-tyrant (*Pogonotriccus lanyoni*).

Status and Conservation. ENDANGERED. Restricted-range species: present in Atlantic Forest Mountains EBA. Known from only three localities: small forest remnants in Serra do Ouricana (near Boa Nova), Itatingui and the Chapada Diamantina National Park. Global range no more than c. 1500 km². Threatened by rapid clearance of forests through expansion of pastureland and cultivation. The few privately owned and mostly highly disturbed forest remnants in Serra da Ouricana held c. 10 pairs, but are under severe pressure from clearance and the spreading of fires from cultivated areas; by 1999, largest remaining patch, of c. 3 km², had been largely destroyed, and long-term survival of this species in the area is highly questionable. Bulk of its population is found within the relatively large Chapada Diamantina National Park, in which it has been recorded in three different places; the park's forests are largely in pristine condition, but threatened by illegal charcoal-burning, random settlement and clearance (logging trucks are a fairly common sight). This tyrannid's global population of a few thousand individuals is likely to decline rapidly in the near future, unless effective protection of Chapada Diamantina and surrounding forests is achieved, or new populations are found between there and Boa Nova.

Bibliography. Anon. (1995b, 2000b, 2003f), Clay, Tobias *et al.* (1998), Gonzaga & Pacheco (1995), Gonzaga *et al.* (1995), Parrini *et al.* (1999), Raposo *et al.* (2002), Stattersfield & Capper (2000), Stotz *et al.* (1996).

96. Yellow-green Tyrannulet

Phylloscartes flavovirens

French: Tyranneau jaune-vert **German**: Panamalaubtyrann **Spanish**: Orejerito Verdiamarillo

Taxonomy. *Leptopogon flavovirens* Lawrence, 1862, Panama Railroad, Panama.
Forms a superspecies with *P. ventralis* and *P. virescens*, all formerly treated as conspecific; *P. kronei* and *P. beckeri* (both recently described) apparently belong with this group. Monotypic.
Distribution. E Panama, from Canal Zone E to Darién.



Descriptive notes. 12 cm; 8 g. Plumage is olive above, crown same colour as back; supraloral region faintly grizzled whitish and connecting with prominent white eyering; lores and narrow line behind eye dusky, face otherwise yellowish-green; wings dusky, two yellow wingbars, margins of remiges narrowly edged yellow; tail olive; entire underparts bright yellow; iris brown; bill long, pointed, black; legs grey. Sexes alike. Juvenile not described. VOICE. Short, high "pweet!" or "ptwit!", sometimes followed by short chatter of high, thin notes.
Habitat. Montane evergreen forest, from 900 m to 2000 m, occasionally to borders of upper tropical forest, treefall gaps, and older second growth, rarely to scattered trees in forest clearings.
Food and Feeding. Arthropods. Forages very actively in humid forest canopy, usually in mixed-species flocks. Perches horizontally, tail carried nearly horizontal or slightly cocked, wings held or flicked slightly out from body, sometimes one wing quickly raised over back and then lowered. Restless; makes short sallies to leaf surfaces to snatch or hover-glean prey.
Breeding. No published information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Not well known. Regularly observed on Chiva Chiva road and at Madden Lake; possibly occurs also across Panama border, in N Colombia.

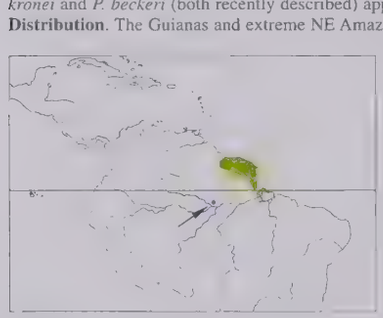
Bibliography. Anon. (1998a), Cory & Hellmayr (1927), Eisenmann (1955), Fitzpatrick & Stotz (1997), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Stotz *et al.* (1996), Traylor (1977), Wetmore (1972).

97. Olive-green Tyrannulet

Phylloscartes virescens

French: Tyranneau verdâtre **German**: Guayanalaubtyrann **Spanish**: Orejerito Verdoso

Taxonomy. *Phylloscartes virescens* Todd, 1925, Pied Saut, French Guiana.
Forms a superspecies with *P. ventralis* and *P. flavovirens*, all formerly treated as conspecific; *P. kronei* and *P. beckeri* (both recently described) apparently belong with this group. Monotypic.
Distribution. The Guianas and extreme NE Amazonian Brazil (Amapá); also near Manaus.



Descriptive notes. 12 cm; 8 g. Plumage is olive above, crown same colour as back; supraloral region faintly yellowish-white, connecting with prominent yellowish eyering; face yellowish-green; wings dusky, two medium-yellow wingbars, margins of remiges narrowly edged yellow; tail olive; entire underparts medium yellow; iris brown; bill long, pointed, black; legs grey. Sexes alike. Juvenile not described. VOICE. Song, by both members of foraging pair, a series of high, reedy notes preceded by louder, exclamatory note, "Queet!-peet-peet-peet-peet"; loud introductory note also frequently given singly, sometimes followed by disorganized chatter.
Habitat. Canopy and borders of humid evergreen forest, usually high in primary forest but occasionally in tall second growth and along treefall gaps; at c. 500 m.
Food and Feeding. Arthropods. Usually joins mixed-species flocks containing greenlets (*Hylophilus*), tanagers (Thraupidae), antbirds (Thamnophilidae), and other tyranids. Forages very actively in uppermost foliage of tall trees, tail carried nearly horizontal or slightly cocked, wings held slightly out from body; sometimes raises one wing. Sallies short distances to leaf surfaces to snatch or hover-glean prey.
Breeding. No data. Season probably Dec-Mar.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare; perhaps often overlooked. Occurs in Brownsberg Nature Park, in Surinam; numerous recent sight records from near Manaus, in Brazil. Poorly known; range possibly extends into E Venezuela. Published record from W of R Negro (Manacapuru) involved a misidentified individual. Thought not to be at any risk, as much of its habitat remains undisturbed.

Bibliography. Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Cracraft (1985), Fitzpatrick & Stotz (1997), Forrester (1993), Haverschmidt (1968), Haverschmidt & Mees (1994), Naka (2004), Parker *et al.* (1993), Ridgely & Tudor (1994), Snyder (1966), Stotz (1990b), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977).

98. Ecuadorian Tyrannulet

Phylloscartes gualaquizae

French: Tyranneau d'Équateur **Spanish**: Orejerito Ecuatoriano
German: Graukronen-Laubtyrann
Other common names: Ecuadorian Bristle-tyrant

Taxonomy. *Pogonotriccus gualaquizae* P. L. Sclater, 1887, Gualaquiza, Morona-Santiago, Ecuador.
Originally included in genus *Pogonotriccus*, but behaviour typical of present genus, with which former was for a time merged. Monotypic.
Distribution. Forested E Andes of Ecuador (S from N Sucumbíos and W Napo) and N Peru (San Martín).



Descriptive notes. 11·5 cm; 8 g. Has grey crown, indistinct whitish supercilium and eyering; face and auriculars pale yellow to whitish, indistinct blackish auricular crescent; upperparts olive, wings dusky, two pale yellow wingbars, margins of remiges edged and tipped pale yellow; tail olive; throat whitish, underparts bright yellow, lightly suffused with olive on breast; iris brown; bill long, pointed, black; legs grey. Sexes alike. Juvenile undescribed. VOICE. High and thin, including single thin "feeee", and thin wheezy trill that descends, ascends, then descends again.
Habitat. Humid montane and upper tropical forest in Andean foothills, mainly below mossy cloud-forest zone; 700-1400 m.
Food and Feeding. Little known. Diet probably arthropods. Forages singly or in pairs, almost always with mixed-species flocks, very high in canopy of tall forest, only rarely descending at forest edges. Restless and active forager, perches horizontally, carries tail nearly horizontal or slightly cocked, frequently holds or flicks wings slightly out from body; sometimes flicks one wing high over back.
Breeding. No information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Ecuador-Peru East Andes EBA. Uncommon to locally fairly common; often overlooked. Range possibly extends N into S Colombia. In Ecuador, fairly common in Serranías Cofán (Sucumbíos) and occurs in Podocarpus National Park; fairly common in R Afluente region, in Peru. Many forests within the species' range are threatened by logging, mining, agriculture and road-building, but some large protected areas exist (e.g. Podocarpus and Sangay National Parks, both in Ecuador).

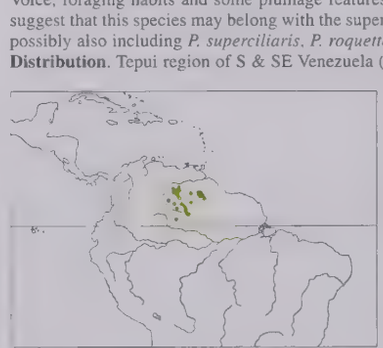
Bibliography. Cory & Hellmayr (1927), Graves (1988a), Hornbuckle (1999), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robbins *et al.* (1987), Stotz *et al.* (1996), Traylor (1977).

99. Black-fronted Tyrannulet

Phylloscartes nigrifrons

French: Tyranneau à front noir **Spanish**: Orejerito Frentinegro
German: Schwarzstirn-Laubtyrann

Taxonomy. *Leptopogon nigrifrons* Salvin and Godman, 1884, Roraima, 5000 feet [c. 1520 m], "British Guiana" = Venezuela.
Voice, foraging habits and some plumage features (dark lores and forehead, white nasal plumes) suggest that this species may belong with the superspecies formed by *P. flaviventris* and *P. parkeri*, possibly also including *P. superciliaris*, *P. roquettei* and *P. sylviolus*. Monotypic.
Distribution. Tepui region of S & SE Venezuela (Amazonas, S Bolívar) and adjacent Guyana.



Descriptive notes. 12·5 cm; 10-11 g. Has dark grey crown, black forehead and narrow loral line, white nasal plumes and narrow supercilium; face and auriculars grizzled white and blackish, bordered above and behind by black auricular crescent; upperparts dark olive, wings blackish, two wide, pale yellow wingbars, margins of remiges faintly edged light olive-yellow; tail olive; throat mottled grey and white, breast pale grey, belly pale yellowish-white; iris brown; bill long, pointed, black; legs grey. Sexes alike. Juvenile undescribed. VOICE. High, sharp notes; also high, thin trill with 2 introductory notes and descending near end, "tsuk-cheez-tr-r-r-r-r-r-r-r-r-r-r-r", also shorter version, also ending in brief trill, "chek-chek-ch'leet!".
Habitat. Humid montane forest and dense, taller second growth, mainly below the wettest, mossy cloudforest; 800-1800 m.
Food and Feeding. Insects; possibly also small fruits such as *Miconia*, as sometimes found in dense melastome (Melastomataceae) thickets. Almost always in pairs, or with additional juveniles, in mixed-species flocks. Forages very actively, in upper and outer canopy. Perches horizontally, tail carried horizontal or slightly cocked, occasionally flicked downwards while foraging; wings frequently held or flicked slightly out from body, sometimes one wing flicked high over back. Restless, rarely pauses for more than 1-2 seconds; makes short sallies to leaf surfaces to snatch or hover-glean prey, often at outer or terminal twigs and leaves.
Breeding. No data.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tepuis EBA. Uncommon to fairly common; fairly common on Sierra de Lema, in E Bolívar. Occurs in Canaíma National Park, in Venezuela. Range believed to extend into adjacent parts of N Brazil. Tepuis within its range are rather unaffected by human disturbance owing to their inaccessibility, and much suitable habitat remains. Vegetation on tepuis, however, is especially sensitive to fire and

other disturbances; in addition, gold-prospectors and uncontrolled tourism have recently had severe local impacts.
Bibliography. Chapman (1931), Cory & Hellmayr (1927), Cracraft (1985), Hilty (2003), Mayr & Phelps (1967), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Stotz *et al.* (1996), Willard *et al.* (1991).

100. Alagoas Tyrannulet

Phylloscartes ceciliae

French: Tyranneau de Cecilia **German**: Alagoaslaubtyrann **Spanish**: Orejerito de Alagoas
Other common names: Long-tailed Tyrannulet

Taxonomy. *Phylloscartes ceciliae* Teixeira, 1987, Serra Branca, Murici County, Alagoas, Brazil.
Apparently close to the superspecies formed by *P. flaviventris* and *P. parkeri*, possibly also including *P. nigrifrons*, *P. superciliaris*, *P. roquettei* and *P. sylviolus*. Monotypic.
Distribution. Alagoas, in NE Brazil.



Descriptive notes. 11-12 cm; 7-8 g. Plumage is dark olive-green above; whitish supercilium, spot below eye and auriculars, auriculars and eye spot bordered by ashy black "bridle" connecting with broad blackish eyeline; wings blackish-olive, edged yellowish green, wing-coverts broadly tipped greenish-yellow (two wingbars), outer margins of inner remiges broadly edged and tipped yellowish-green; tail blackish, edged yellowish-green; throat and breast whitish, breast side washed with dark green, remaining underparts white, faintly washed pale yellow on belly and undertail-coverts; iris chestnut-brown; bill pointed, black; legs dark bluish-grey. Sexes alike. Juvenile undescribed. Voice. Peeping sequence of "dju" notes, sometimes sharper and faster, "ururut, ururut..."; soft "thup" call note.
Habitat. Remnant highland evergreen forest, also mature second growth, in Atlantic Forest region; 400-550 m.
Food and Feeding. Insects. Often joins mixed-species flocks containing other tyrannids, furnariids, dendrocolaptids and antbirds (Thamnophilidae). Forages actively in middle and upper canopy of tall trees, tail carried cocked at or above horizontal; sallies to leaf surfaces to snatch or hover-glean prey.
Breeding. Not documented; moult cycle of the few specimens suggests breeding between Sept and Feb.
Movements. Resident.
Status and Conservation. CRITICAL. Restricted-range species: present in Atlantic Slope of Alagoas and Pernambuco EBA. Locally fairly common. Known from only three localities, two of which on SE escarpment of Borborema Plateau; first discovered in 1983, on slopes of Pedra Branca, near Murici, where considered to be rather common at type locality. Forests around Murici reduced from 70 km² in 1970s to a mere 30 km² in 1999; only c. 2% of original forests remain in Alagoas and Pernambuco, and these highly disturbed and severely fragmented, and still threatened by small-scale cultivation, firewood-gathering, and spreading of fires from adjacent plantations; further logging, with associated new roads, was evident in 1999, eradicating forest even on steep slopes. Some forest protected in the Murici Ecological Reserve (30 km²), but most of surrounding land privately owned, and a number of conservation initiatives have so far failed to halt further forest loss; best areas now lie almost exclusively within the privately managed 1200-ha Fazenda Bananeira. In late 1980s, the species was also found at Pedra Talhada State Park (45 km²), where significant areas are being reforested with native trees; protection at this reserve is enforced by guards and apparently welcomed by local communities, but during 15 days of observations between 1996 and 1999 the species was found on only three occasions. In 2003, it was also recorded at the 630-ha Patrimônio Natural Frei Caneca Private Reserve, in Pernambuco, thus extending its range and improving its chances of survival. Further searches may locate additional sites in Pernambuco and Alagoas, e.g. at Usina Serra Grande.
Bibliography. Clay, Tobias *et al.* (1998), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Goerck (2001), Kirwan *et al.* (2001), Lowen (2001), Raposo *et al.* (2002), Ridgely & Tudor (1994), Roda *et al.* (2003), Sick (1993, 1997), Silveira *et al.* (2003), Stattersfield & Capper (2000), Stotz *et al.* (1996), Stuart (2003), Teixeira (1987), Vuilleumier *et al.* (1992), Wege & Long (1995).

101. Rufous-browed Tyrannulet

Phylloscartes superciliaris

French: Tyranneau à sourcils roux **Spanish**: Orejerito Cejirrufo
German: Weißwangen-Laubtyrann

Taxonomy. *Leptotriccus superciliaris* P. L. Sclater and Salvin, 1868, Chitrá, Veraguas, Panama.
Was once included in genus *Mecocerculus*. Vocal similarities and plumage (rufous above lores) suggest that it is possibly a member of the superspecies formed by *P. flaviventris* and *P. parkeri*, perhaps also including *P. nigrifrons*, *P. roquettei* and *P. sylviolus*. Geographical variation minor; validity of races impossible to assess, as so few specimens available. Three subspecies tentatively recognized.
Subspecies and Distribution.
P. s. superciliaris (P. L. Sclater & Salvin, 1868) - forested mountains of Costa Rica and W Panama.
P. s. palloris (Griscom, 1935) - E Panama (Darién).
P. s. griseocapillus Phelps, Sr & Phelps, Jr, 1952 - very locally in NW Venezuela (Sierra de Perijá), Colombia (E Andes, possibly also Chocó region) and E slopes in SE Ecuador (Cordillera de Cutucú, Cordillera del Condor).
Descriptive notes. 12 cm; 7-8 g. Nominate race has pearly grey crown, bright chestnut frontal band and narrow supercilium, pure white spot at base of bill, white auricular patch conspicuously encircled with black and, posteriorly, with chestnut; upperparts bright olive; wings dusky olive, edged yellow-green, tail dusky olive; lower face grizzled whitish, throat greyish-white, underparts white, tinged yellow-green on flanks and faintly yellowish on belly and undertail-coverts; iris dark brown; bill black; legs dark grey. Sexes alike. Juvenile undescribed. Races differ only slightly: *palloris* has crown darker than nominate and slightly suffused with brownish, duller olive back, paler grey breast, almost pure white belly; *griseocapillus* has darker grey crown, darker chestnut lores, brighter green back, pale yellow undertail-coverts. Voice. Calls and sings frequently, with lively series of sharp, high pitched notes, "swee-swee-swee"; single, sharp "swik" delivered at irregular intervals.



Habitat. Humid montane forest, occasionally venturing to forest edges and treefall openings; at 600-1200 m in Costa Rica and Panama, 1600-2000 m in Colombia, Venezuela and Ecuador.
Food and Feeding. Insects; small fruits (*Miconia*, *Trema*) sometimes taken. Almost always forages in pairs or small family parties, in mixed-species flocks. Forages very actively, very high in upper and outer canopy, lower at edges and openings; seemingly favours trees with small leaves, where forages at outer perimeters; perches horizontally, tail carried nearly horizontal or slightly cocked, wings frequently held or flicked slightly out from body, sometimes one wing flicked high over back. Restless, rarely pauses for more than 1-2 seconds; makes short sallies to leaf surfaces to snatch or hover-glean prey, often at outer or terminal twigs and leaves.
Breeding. No confirmed data; believed to breed in Mar-Jun in Costa Rica.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common, and very local. A poorly known species. Occurs in Rancho Naturalista and Río Negro Jaguar Reserve, both in Costa Rica. Range possibly extends S into N Peru.
Bibliography. Anon. (1998a), Cory & Hellmayr (1927), Cracraft (1985), Eisenmann (1955), Fitzpatrick & Stotz (1997), Gonzaga & Pacheco (1995), Hilty (2003), Hilty & Brown (1986), Kirwan *et al.* (2001), Meyer de Schauensee (1982), Negret (2001), Raposo *et al.* (2002), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Traylor (1977), Wetmore (1972).

102. Rufous-lored Tyrannulet

Phylloscartes flaviventris

French: Tyranneau masqué **German**: Rostzügel-Laubtyrann **Spanish**: Orejerito Amarillo
Other common names: Yellow-bellied Bristle-tyrant

Taxonomy. *Leptotriccus flaviventris* Hartert, 1897, Mérida, Venezuela.
Forms a superspecies with *P. parkeri*, possibly also including *P. nigrifrons*, *P. superciliaris*, *P. roquettei* and *P. sylviolus*. Monotypic.
Distribution. N Venezuela: Yaracuy and coastal mountains from W Carabobo E to Distrito Federal, also interior Miranda (Cerro Negro). Also reported in past from Mérida, but probably erroneously.



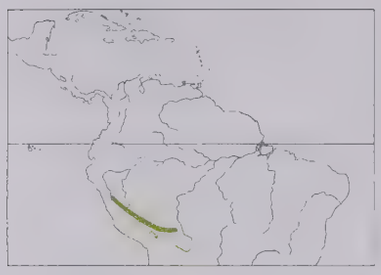
Descriptive notes. 12 cm; 8 g. Plumage is dark olive above, crown slightly darker than back; prominent rufous forehead and supraloral stripe, becoming yellow stripe behind eye, bordered below by blackish lores and moustachial region; rufous broken eyering; yellowish auriculars bordered above and behind by black crescent; wings blackish, two bright yellow wingbars, margins of remiges broadly edged and tipped bright yellow; tail olive; entire underparts bright yellow; iris brown; bill long, pointed, black; legs grey. Sexes alike. Juvenile undescribed. Voice. A short, rapid series of high, thin notes, "tseep-tseep-tseep", sometimes ending with more emphatic "seet".
Habitat. Montane evergreen forest, often venturing to forest edges and montane roadcuts bordered by tall trees; usually in tall upper tropical forest, only rarely up slopes to mossy ridgetop cloudforest. From 300 m to 1200 m.
Food and Feeding. Insects recorded in diet. Almost always forages in pairs or small family parties, in mixed-species flocks. Forages very actively, in middle and upper canopy of humid forest; perches horizontally, with tail carried nearly horizontal or slightly cocked, and wings frequently held or flicked slightly outwards from body. Restless, rarely pauses for more than 1-2 seconds; makes short sallies to leaf surfaces to snatch or hover-glean prey, often at outer or terminal twigs and leaves.
Breeding. No confirmed data; family groups observed in Feb.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Occurs in Guatopo and Henri Pittier National Parks (especially numerous around Rancho Grande and Maracay-Choroní road). Although extensive forest cover still exists in parts of its limited range, deforestation has been severe around residential areas, e.g. Caracas, as well as in many other areas.
Bibliography. Cory & Hellmayr (1927), Fitzpatrick & Stotz (1997), Gonzaga & Pacheco (1995), Hilty (2003), Kirwan *et al.* (2001), Meyer de Schauensee (1982), Raposo *et al.* (2002), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977), Visbal *et al.* (1996).

103. Cinnamon-faced Tyrannulet

Phylloscartes parkeri

French: Tyranneau de Parker **German**: Zimtgesicht-Laubtyrann **Spanish**: Orejerito de Parker

Taxonomy. *Phylloscartes parkeri* Fitzpatrick and Stotz, 1997, Hacienda Amazonía, Madre de Dios, Peru.
Recently described, although long known from a single specimen collected in 1899. Forms a superspecies with *P. flaviventris*, possibly also including *P. nigrifrons*, *P. superciliaris*, *P. roquettei* and *P. sylviolus*. Monotypic.
Distribution. Forested E Andes from C Peru (Huánuco and Pasco) S to extreme N Bolivia (S Beni).
Descriptive notes. 12 cm; 8 g. Has medium-grey crown, prominent cinnamon-rufous forehead and supraloral stripe becoming yellow to yellowish-white stripe behind eye; white nasal plumes, rufous broken eyering; pale cinnamon face and auricular patch, bordered above and behind by black auricular crescent; upperparts olive, wings blackish, two bright yellow wingbars, margins of remiges broadly edged and tipped bright yellow, tail olive; entire underparts bright yellow; iris brown; bill long, pointed, black; legs grey. Sexes alike. Juvenile resembles adult. Voice. Calls and sings fre-



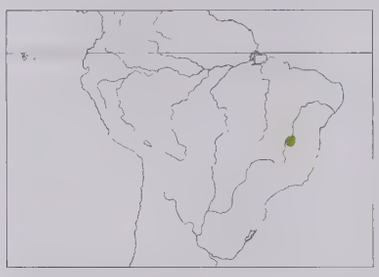
quently, with high, emphatic "tsit!" notes, occasionally delivered in rapid series followed by sharp ascending and then descending trill, "tsit-tsit-tsr-r-r-e-e-e-r-r-r-r".
Habitat. Montane evergreen forest, rarely venturing to forest edges; remains in highest portions of canopy in tall upper tropical forest, occasionally up slopes to mossy ridgetop cloudforest. From 700 m to 1200 m.
Food and Feeding. Arthropods. Stomach contents from SE Peru included 63 identified items, of which beetles (Coleoptera) 38%, homopteran bugs 18%, hymenopterans 32% (ants 16%, wasps 16%), hemipterans 5%, flies (Diptera) 3%, spiders (Araneae) 3%, lepidopterans 1%. Almost always forages in pairs or small family groups, in mixed-species flocks. Forages very actively, very high in upper and outer canopy, seemingly favouring trees with small leaves and foraging at their outer perimeters. Perches horizontally, with tail carried nearly horizontal or slightly cocked, wings frequently held or flicked slightly out from body; rapidly alternates orientation on perch by facing one way, and then flipping 180 degrees to face opposite direction. Restless, rarely pauses for more than 1-2 seconds; makes short sallies to leaf surfaces to snatch or hover-glean prey, often at outer or terminal twigs and leaves.
Breeding. Birds with enlarged gonads, and presence of juveniles, in Nov in SE Peru, suggesting breeding Sept-Dec. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Occurs along R Urubamba (below Machu Picchu) and in Manu National Park and Biosphere Reserve, in Peru, and Pilón Lajas Biosphere Reserve and Madidi National Park, in Bolivia. Appears to be confined to primary evergreen forest with intact tall canopy and within narrow elevational range; is therefore sensitive to selective logging and other types of habitat degradation.
Bibliography. Fitzpatrick & Stotz (1997), Green (1998), Hennessey, Herzog & Sagot (2003), Kirwan *et al.* (2001), Raposo *et al.* (2002), Sangster (1998), Schulenberg & Servat (2001), Stotz *et al.* (1996).

104. Minas Gerais Tyrannulet

Phylloscartes roquettei

French: Tyranneau de Minas Gerais **Spanish**: Orejerito de Minas Gerais
German: Gelbbürzel-Laubtyrann

Taxonomy. *Phylloscartes roquettei* E. Snethlage, 1928, Brejo Januária, São Francisco River, Minas Gerais, Brazil.
Affinities uncertain; possibly related distantly to the superspecies formed by *P. flaviventris* and *P. parkeri*, perhaps also including *P. nigrifrons*, *P. superciliaris* and *P. sylviolus*. Monotypic.
Distribution. N Minas Gerais, in E Brazil.



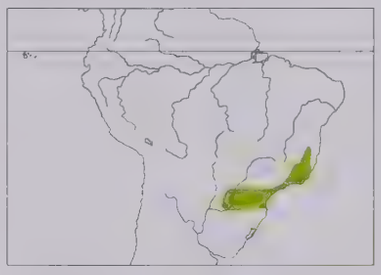
Descriptive notes. 12 cm; c. 8 g. Plumage is olive above, crown same colour as back; prominent rufous to ochraceous forehead and supraloral region, thin buffy broken eyering, blackish lores, yellowish auriculars bordered blackish above and behind; wings dusky, two yellow wingbars, margins of remiges edged and tipped bright yellow; tail olive; entire underparts medium yellow; iris probably brown; bill long, pointed, black, base of lower mandible ashy; legs greyish-brown. Sexes alike. Juvenile resembles adult. Voice. Song a fast series of high, harmonic notes, introductory note slightly louder and higher; calls are individual notes similar to those in song.
Habitat. Tropical dry forest, gallery forest, and tall deciduous scrub, especially those closely associated with river courses; prefers tall emergent trees (remnants of earlier primary forest) within degraded dry or gallery forest.
Food and Feeding. Arthropods. Forages in pairs or family groups, only rarely in mixed-species flocks (unlike many of its congeners), mainly in mid-canopy and upper canopy of taller trees, occasionally descending to lower branches within 2-3 m of ground to forage in denser foliage when in leafless deciduous trees. Active and restless, holding body horizontally or at 45-degree angle, tail slightly above horizontal and bobbing slightly, wings held out or drooped; occasionally raises one wing above back, sometimes followed by other wing (never both together). Makes short sallies to snatch insects from branches and leaves, rarely from air; occasionally reaches to pick prey from leaf surfaces. Movements between perches rarely exceed 1 m, often involving rapid diagonal flight downwards and then looping back to perch on lower branch; "loop" flight sufficiently distinctive to identify the species at a distance in the field.
Breeding. One nest found in Oct; family with fledged young in Feb. Nest roughly globular in shape, approximate dimensions 10 cm tall and 6-7 cm across (when still under construction), short side entrance tube, constructed from fine rootlets, dead twigs, lichens, grassy material and small number of dead leaves, attached almost at extreme tip of small branch c. 10 m above ground in streamside tree and within 1 m of termitarium suspended close to main trunk; both pair-members actively collected material, usually very close to or directly from ground. No further information.
Movements. Apparently resident.
Status and Conservation. CRITICAL. Restricted-range species: present in Deciduous Forests of Minas Gerais and Goiás EBA. Found at only 3-4 localities in mesophytic, semi-deciduous dry forest and gallery forest, probably the most threatened habitat in C & E Brazil owing to its valuable aroeira (*Astronium urundeuva*) timber and relatively fertile soils. First discovered in Jul 1926 and not seen again for 50 years; relocated in 1977 near type locality, but searches there in 1985, 1986 and 1987 were unsuccessful; in 1986, charcoal-burners were fully active, and forests were extensively cut down for timber, limestone quarrying, pasture and cultivation. In 1993 the species was discovered c. 250 km S of type locality, at Várzea da Palma (SE of Pirapora), where it was very rare in 1998, 1999 and 2002, and in 1995 it was found at Francisco Dumont; in this region, a major irrigation project is underway which has already led to the deforestation of large areas. In 2004 it was found 40 km NNE of type locality, in Cavernas do Peruaçu National Park (where possibly recorded earlier, in 1997); this is the only protected area in the species' known range. Unless additional populations are found, or the known and extremely small occupied sites are effectively protected, this tyrannid, which probably numbers no more than a few hundred individuals, is likely to become extinct in the very near future.
Bibliography. Cavalcanti (1988), Clay, Tobias *et al.* (1998), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cracraft (1985), Fitzpatrick & Stotz (1997), Kirwan, Mazar Barnett, Ferreira *et al.* (2004), Kirwan, Mazar Barnett & Minns (2001), Meyer de Schauensee (1982), Raposo *et al.* (2002), Ridgely & Tudor (1994), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Wege & Long (1995), Willis & Oniki (1991).

105. Bay-ringed Tyrannulet

Phylloscartes sylviolus

French: Tyranneau sylvain **German**: Rostring-Laubtyrann **Spanish**: Orejerito Ojirrojo

Taxonomy. *L[eptotriccus] sylviolus* Cabanis and Heine, 1859, Rio de Janeiro, Brazil.
Was for long treated in a monotypic genus, *Leptotriccus*, but seems typical member of present genus. May belong with the superspecies formed by *P. flaviventris* and *P. parkeri*, possibly also including *P. nigrifrons*, *P. superciliaris* and *P. roquettei*. Monotypic.
Distribution. Extreme E Paraguay, SE Brazil (S Minas Gerais and Espírito Santo S to Santa Catarina) and NE Argentina (Misiones).



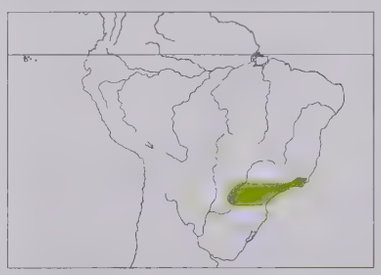
Descriptive notes. 12 cm; c. 8 g. Upperparts and crown bright yellowish olive; prominent loral patch and eyering rufous-chestnut, auriculars yellow-green and lacking any contrasting dark patch, but bordered below by pale yellow; wings like back, wing-coverts and remiges edged slightly brighter yellow but wingbars lacking; tail dusky olive; chin buffy-yellow, rest of underparts whitish, tinged light green on upper flanks and pale yellow on undertail-coverts; iris whitish; bill long, pointed, black, base of mandible ashy; legs and feet grey. Sexes alike. Juvenile probably resembles adult. Voice. Song is a fast, complex series of high notes, "swit-swi-swi-swi-swi-deedeedeedee-swi-swi."
Habitat. Humid lowland and foothill evergreen forest and forest edge, to 600 m.
Food and Feeding. Arthropods. Forages alone or in pairs, occasionally in family groups of 3-5 birds, mainly in forest canopy, often in company of mixed species flocks; active and restless while foraging, holding body horizontally with long tail cocked above horizontal and wings often held out or drooped. Makes short sallies to snatch or hover-glean insects from branches and leaves, rarely from air; occasionally reaches to pick insects from leaf surfaces.
Breeding. Aug-Oct in Argentina; adults with fledged young in Feb, in Brazil. Hanging nest with lateral entrance hole, composed mainly of moss and suspended below a horizontal branch 10-16 m above ground. Clutch size and eggs undescribed. No further information.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Uncommon to scarce. Occurs in several protected areas, in Brazil including e.g. Iguaçu National Park and Mata dos Godoy State Park (both in Paraná), and Intervales State Park (São Paulo), where rarely observed around Saibadela Research Station but more abundant at upper elevations within the park; in Argentina, regular in forests near Iguazú Falls in Iguazú National Park; and in Paraguay, uncommon at Estancia Itabó Private Nature Reserve, Mbaracayú Forest Nature Reserve, and Caaguazú and San Rafael National Parks. Atlantic Forest continuously threatened by agricultural conversion, mining, urbanization, industrialization, and associated road-building.
Bibliography. Aleixo & Galetti (1997), Brooks *et al.* (1993), Canevari *et al.* (1991), Clay, Tobias *et al.* (1998), Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Fitzpatrick & Stotz (1997), Hayes (1995), Kirwan *et al.* (2001), Lowen *et al.* (1996), Meyer de Schauensee (1982), Madroño & Esquivel (1997), Naka *et al.* (2001), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Pinto (1944), Raposo *et al.* (2002), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993).

106. Sao Paulo Tyrannulet

Phylloscartes paulista

French: Tyranneau de Sao Paulo **German**: Zwerglaubtyrann **Spanish**: Orejerito de Sao Paulo

Taxonomy. [*Phylloscartes*] *paulista* H. von Ihering and R. von Ihering, 1907, Fazenda Cayoá, Sao Paulo, Brazil.
Monotypic.
Distribution. SE Brazil (SE Mato Grosso do Sul E to Espírito Santo, S to Santa Catarina), E Paraguay and NE Argentina (Misiones).



Descriptive notes. 10·5 cm; 7-8 g. Olive above, crown same colour as back; narrow yellow supercilium extends well behind eye, then down to wrap around broad black auricular crescent; face yellowish; wings dusky olive, two indistinct wingbars and narrow margins of remiges yellowish-olive; tail olive; entire underparts dull yellow, heavily suffused with olive on breast; iris brown; bill long, pointed, black; legs grey. Sexes alike. Juvenile undescribed. Voice. Softly whistled "swee-eet".
Habitat. Humid tropical and upper tropical forest and forest borders, mainly below 500 m, occasionally to 1000 m. Replaced by *P. oustaleti* at upper elevations.
Food and Feeding. Arthropods. Forages singly or in pairs, almost always with mixed-species flocks (which often also contain *Pogonotriccus eximius*), in understorey and mid-storey. Active. Posture nearly upright, less horizontal than that of most congeners, but foraging behaviour equally frenetic, with wings often held slightly out from body, and frequently jerking back and forth 180 degrees on perch. Sallies to snatch or hover-glean insects from leaves and vines, sometimes clambering under leaf clusters.
Breeding. Testes enlarged in Oct and not enlarged in Jan or Apr, season presumably Sept-Dec. No other information.

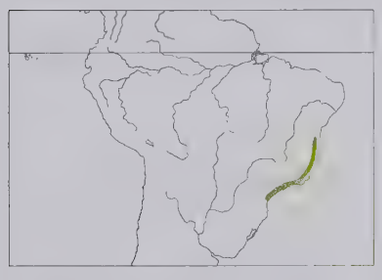
Movements. Resident.
Status and Conservation. VULNERABLE. Rare to uncommon. Found at relatively few sites. Global population probably fewer than 10,000 individuals. Destruction and fragmentation of lowland Atlantic Forest has had devastating effect on this species' habitat; following agricultural conversion and deforestation for coffee, banana and rubber plantations, less than 20% of original forest cover remains intact. In Paraguay alone, 38% of forests disappeared between 1984 and 1991. Remaining forests, even within protected areas, suffer from agricultural expansion, mining, urbanization, industrialization, and associated road-building. In Brazil, the species is fairly common in Intervales State Park (at Saibadela Research Station), in Iguaçu National Park (a few thousand individuals) and in Ilha do Cardoso State Park, and occurs also in at least ten other nominally protected areas; probably locally extinct in Espírito Santo, where no records since 1942. Present also in Caaguazú, San Rafael and Ybycuí National Parks, in Paraguay, and Iguazú National Park, in Argentina, as well as in several other protected areas in both countries.
Bibliography. Aleixo & Galetti (1997), Brooks *et al.* (1993), Buzzetti (2000), Canevari *et al.* (1991), Chebez (1994), Chebez *et al.* (1999), Clay, Tobias *et al.* (1998), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Cracraft (1985), Hayes (1995), Lowen *et al.* (1996), Madroño & Esquivel (1995), Narosky & Yzurieta (1993), de la Peña (1988), Ridgely & Tudor (1994), do Rosário (1996), Scott & Brooke (1985), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Wege & Long (1995).

107. **Oustalet's Tyrannulet**

Phylloscartes oustaleti

French: Tyranneau d'Oustalet **German**: Gelbohr-Laubtyrann **Spanish**: Orejerito de Oustalet

Taxonomy. *Leptopogon oustaleti* P. L. Sclater, 1887, "Bogota"; error = probably Corcovado, Rio de Janeiro, Brazil.
Monotypic.
Distribution. Coastal forests of E Brazil from S Bahia S to E Santa Catarina.



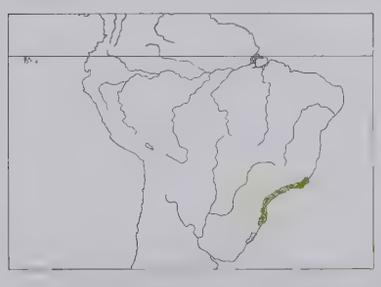
Descriptive notes. 12 cm; 8 g. Plumage is olive above, crown same colour as back; lores yellowish, connecting with prominent, wide yellow eyering; face bright yellow near eye, broad auricular crescent blackish, bordered posteriorly with bright yellow; wings dusky olive, wing-coverts tipped yellowish, margins of remiges narrowly edged yellowish-olive; tail olive; entire underparts bright yellow, heavily suffused with olive on breast; iris brown; bill long, pointed, black; legs grey. Sexes alike. Juvenile undescribed. VOICE. Soft 2-note or 3-note call, "ku-dut" or "ku-dut-dut".
Habitat. Humid tropical and upper tropical forest, mainly in interior, only occasionally along dense forest borders; mostly at 500-900 m. Seems to replace *P. paulista* at higher elevations.
Food and Feeding. Arthropods. Usually forages in pairs or family groups, and almost always with mixed-species flocks (which often also contain *Pogonotriccus eximius*), generally in forest canopy and subcanopy. Posture horizontal, wings held slightly drooped or out from body, tail cocked well above the horizontal, sometimes to nearly vertically over back, and almost constantly quivering. Forages actively; sallies to snatch or hover-glean insects from leaves.
Breeding. No data. Season probably Sept-Dec.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Atlantic Forest Lowlands EBA. Locally uncommon to fairly common. Occurs in several protected areas, e.g. Augusto Ruschi Biological Reserve (Espírito Santo), Intervales State Park (São Paulo) and Mata dos Godoy State Park (Paraná); at Intervales, rarely observed around the Saibadela Research Station but more abundant at upper elevations within the park. Forests within this species' range are continuously threatened by agricultural conversion, mining, urbanization, industrialization, and associated road-building.
Bibliography. Aleixo & Galetti (1997), Clay, Tobias *et al.* (1998), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Cracraft (1985), Machado & Rodrigues (2000), Meyer de Schauensee (1982), Pacheco & Whitney (1995), Parker *et al.* (1996), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Venturini *et al.* (2001).

108. **Serra do Mar Tyrannulet**

Phylloscartes difficilis

French: Tyranneau d'Ihering **Spanish**: Orejerito de Serra do Mar
German: Olivgrau-Laubtyrann
Other common names: Ihering's Tyrannulet

Taxonomy. *Guracava difficilis* H. von Ihering and R. von Ihering, 1907, Campos do Itatiaia, Rio de Janeiro, Brazil.
Monotypic.
Distribution. SE Brazil, from Minas Gerais and Espírito Santo S to Rio Grande do Sul.



Descriptive notes. 11-11·5 cm; c. 7-8 g. Plumage is bright olive above, with prominent white eyering and supraloral stripe, bordered below by blackish lores and area below eye; face grey, blackish auricular crescent; wings olive, same colour as back, faintly paler along margins of remiges; tail olive; entire underparts medium grey, slightly paler on throat and undertail-coverts; iris brown; bill short, pointed, black, paler at base of lower mandible; legs greyish-pink. Sexes alike. Juvenile undescribed. VOICE. Rapid chatter of thin, rather harsh notes.
Habitat. Humid montane forest and its shrubby borders, from 950 m to 2150 m.
Food and Feeding. Arthropods. Forages singly or in pairs, only rarely with mixed-species flocks, in understorey and dense growth of humid vegetation. Somewhat less active than most congeners, but shares with them the horizontal posture, tail often held slightly above horizontal, wings drooped or held out from body; sallies to hover-glean insects from dense foliage.
Breeding. No data. Season presumably Sept-Jan.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Atlantic Forest Mountains EBA. Uncommon. Observed regularly in Itatiaia National Park. Montane forests within this species' range have suffered less destruction than have adjacent lowland areas, but isolated patches in N have virtually disappeared owing to expansion of pasture and cultivation.
Bibliography. Belton (1985), Buzzetti (2000), Clay, Tobias *et al.* (1998), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Gonzaga (2002), Meyer de Schauensee (1982), Parker *et al.* (1996), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Traylor (1977).

Genus *POGONOTRICCUS*

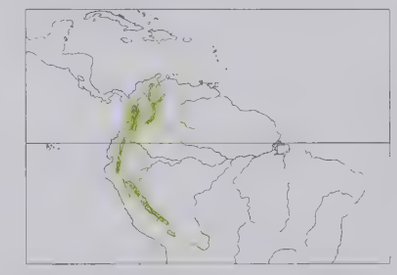
Cabanis & Heine, 1859

109. **Variegated Bristle-tyrant**

Pogonotriccus poecilotis

French: Tyranneau varié **German**: Zimtbinden-Laubtyrann **Spanish**: Orejerito Variegado

Taxonomy. *Leptopogon poecilotis* P. L. Sclater, 1862, "Bogota", Colombia.
Genus previously merged with *Phylloscartes*, and that treatment retained by many authors; despite superficial similarities, however, the two groups differ significantly in foraging behaviour and postures, possibly also in details of nest (little known), and perhaps are not even closely related to one another. Birds from extreme NW Venezuela (Sierra de Perijá) described as race *pifanoi*, supposedly with somewhat more blackish crown, but this difference virtually imperceptible and may represent individual variation. Monotypic.
Distribution. NW Venezuela (Sierra de Perijá, Mérida) and Andes of Colombia, E Ecuador and Peru (Cajamarca and San Martín S, locally, to Puno).



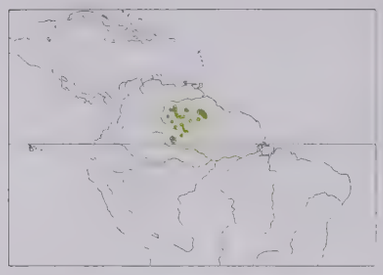
Descriptive notes. 11 cm; 8 g. Has slate-grey crown contrasting with bright yellow-olive upperparts; lores and supercilium grizzled white, supercilium extending back to wrap around black auricular crescent; face yellowish; wings dusky, two broad wingbars bright chestnut-buff, remiges broadly but indistinctly edged buffy; tail dusky olive; throat whitish, underparts bright yellow, washed with olive on breast; iris brown; bill black above, lower mandible orange to yellowish-orange nearly to tip; legs grey. Sexes alike. Juvenile undescribed. VOICE. High, thin "wheee-seet"; also a short, emphatic series of "tsit" notes ending in more emphatic "tsweeet".
Habitat. Humid montane forest, especially wet mossy cloudforest; 1500-2300 m.
Food and Feeding. Arthropods. Forages singly or in pairs, typically in mixed-species flocks (often also containing related *P. ophthalmicus*). Perches in mid-storey and upper branches of mossy forest; posture upright, tail held vertically downwards, frequently lifts or flicks one wing high, then repeats with opposite wing. Feeds with short, outward or upward, looping sallies to snatch or hover-glean insects from undersides of leaves, then rapid flight to new perch.
Breeding. No data.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally common to locally fairly common. Occurs in Tambito Nature Reserve and Ucumarí Regional Park, in Colombia, and in all protected areas along E Andean slope of Ecuador. A single reported record from W Ecuador is considered uncertain.
Bibliography. Aveledo & Pons (1952), Chapman (1917c, 1926), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Miller (1963), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977).

110. **Chapman's Bristle-tyrant**

Pogonotriccus chapmani

French: Tyranneau de Chapman **Spanish**: Orejerito de Chapman
German: Olivkappen-Laubtyrann
Other common names: Chapman's Tyrannulet

Taxonomy. *Phylloscartes chapmani* Gilliard, 1940, Cerro Roraima, 4200 feet [c. 1280 m], Venezuela.
Genus previously merged with *Phylloscartes*, and that treatment retained by many authors; despite superficial similarities, however, the two groups differ significantly in foraging behaviour and postures, possibly also in details of nest (little known), and perhaps are not even closely related to one another. Two subspecies recognized.
Subspecies and Distribution.
P. c. chapmani (Gilliard, 1940) - tepui region of S Venezuela (S Bolívar and N Amazonas) and adjacent Guyana and Brazil.
P. c. duidae (Phelps, Sr & Phelps, Jr, 1951) - Cerros Duida and Neblina in S Venezuela (S Amazonas) and adjoining Brazil.
Descriptive notes. 12 cm; 8 g. Plumage is dull olive above, crown slightly darker olive; ill-defined supraloral stripe whitish, white eyering; black eyeline meeting sharp black auricular crescent behind cheeks; wings dusky, two buffy wingbars, edges of flight-feathers pale buffy yellow to buffy white, innermost secondaries broadly tipped pale buff (forming spots); tail dusky olive; lower face grizzled whitish and grey, throat and breast olive-yellow, rest of underparts pale yellow; iris brown; bill short, pointed, black, paler yellow at base of lower mandible; legs grey. Sexes alike. Juvenile



undescribed. Race *duidae* is paler, more yellow-green, above than nominate, with tips of innermost secondaries darker buff, edges of remiges more yellowish, less buff. Voice. Unknown.

Habitat. Humid montane evergreen forest, especially wet and mossy forest on slopes of tepuis, between 1000 m and 2000 m.

Food and Feeding. Diet unknown; probably insects. Forages in pairs or in (presumably) family groups, typically in mixed-species flocks. Perches in mid-storey of forest; posture upright, tail held vertically downwards; frequently lifts or flicks one wing high. Sallies are usually upwards to hover-glean from undersides of leaves.

Breeding. No data.

Movements. Apparently resident.

Status and Conservation. Not globally threatened. Restricted-range species: present in Tepuis EBA. Poorly known. Apparently locally common. In Venezuela, rare and local on Sierra de Lema and at top of the Escalera (in E Bolívar), but more numerous on Aprada, Chimantá, Parú, Ptari and Sipapo tepuis; occurs in Canaíma National Park. Tepuis within its range are rather unaffected by human disturbance owing to their inaccessibility, but vegetation is especially sensitive to fire and other disturbances; gold-prospectors and uncontrolled tourism have recently had severe local impacts.

Bibliography. Cracraft (1985), Fitzpatrick & Stotz (1997), Forrester (1993), Hilty (2003), Mayr & Phelps (1967), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Willard *et al.* (1991).

111. Marble-faced Bristle-tyrant

Pogonotriccus ophthalmicus

French: Tyranneau marbré **German**: Schwarzohr-Laubtyrann **Spanish**: Orejerito Jaspeado
Other common names: Otto's Bristle-tyrant

Taxonomy. *Pogonotriccus ophthalmicus* Taczanowski, 1874, Amable María, Chanchamayo Valley, Peru.

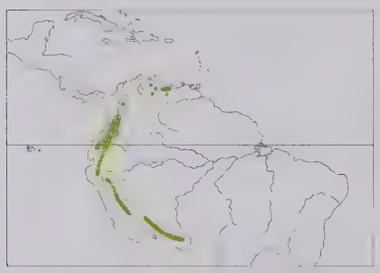
Genus previously merged with *Phylloscartes*, and that treatment retained by many authors; despite superficial similarities, however, the two groups differ significantly in foraging behaviour and postures, possibly also in details of nest (little known), and perhaps are not even closely related to one another. Distinctive S race *ottonis* was once considered a separate species. Three subspecies recognized.

Subspecies and Distribution.

P. o. purus Todd, 1952 - coastal and interior mountains of N Venezuela (Yaracuy, and from Carabobo E to Distrito Federal and Aragua).

P. o. ophthalmicus Taczanowski, 1874 - Andes of Colombia (W & C ranges), NW & E Ecuador and E slope in Peru (S to Ayacucho).

P. o. ottonis Berlepsch, 1901 - SE Peru (Cuzco, Madre de Dios) S to N Bolivia (La Paz, Cochabamba, W Santa Cruz).



Descriptive notes. 11·5 cm; 10-11 g. Nominate race has slate-grey crown contrasting with bright yellow-olive upperparts; lores and supercilium white, face grizzled black and white, auriculars white to very pale yellow with broad black crescent at rear; wings dusky, two wingbars and edges of flight-feathers pale olive-yellow to yellow, innermost remiges broadly edged pale yellow on outer web; tail dusky olive; throat grizzled whitish, underparts bright yellow, heavily washed with darkish olive on breast; iris brown; bill black; legs grey. Sexes alike. Juvenile is duller than adult. Races vary mainly in intensity of yellow on face, wings and underparts: *purus* has brighter yellow face than nominate, more prominent wingbars, somewhat brighter yellow underparts; *ottonis* has pale yellow wingbars, greyish white throat and upper breast washed with pale olive, remaining underparts white to very pale yellow. Voice. Song a rather weak but explosive, high-pitched chatter, ending in rapid, slightly ascending trill, "ju-ju-j-j-j tre-e-e-e-e-e- pit-pit"; call a sharp "ju-é" or "ts-rit".

Habitat. Humid montane forest, especially mossy, middle-elevation cloudforest; remains in forest interior, rarely venturing to edges and clearings. At 800-1700 m in Venezuela, mainly 1400-2400 m in Colombia (but down to 600 m on Pacific slope), 1200-2100 m in Ecuador; 1200-1800 m in SE Peru, but down to 750 m on foothill ridges.

Food and Feeding. Arthropods. Most often seen in pairs with mixed-species flocks of tanagers (Thraupidae), warblers (Parulidae), furnariids and other tyrannids. Forages in middle to lower canopy, perching on exposed horizontal branches and twigs to search surrounding vegetation; pauses for 5-30 seconds at each perch, tail held vertically downwards, head actively scanning around and upwards; unsuccessful searches followed by moves of 2-10 m. Prey captured mainly with upward strikes, snatches and hover-gleans, occasionally pursuing dislodged prey briefly before resting on new perch.

Breeding. Little published information available. Nest-building observed in Jun in Colombia; birds with gonads in reproductive condition, and family groups containing juveniles, in Sept-Dec in SE Peru.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to locally common. Rare at Finca Merenberg (Huila), in Colombia, at upper limit of altitudinal range. Occurs in several protected areas, including Henri Pittier National Park, in Venezuela, Tambito Nature Reserve and Ucumarí Regional Park, in Colombia, Machu Picchu Historical Sanctuary, in Peru, and Pilón Lajas Biosphere Reserve and Madidi National Park, in Bolivia.

Bibliography. Chapman (1917c, 1926), Cory & Hellmayr (1927), Cracraft (1985), Cuervo & Delgado (2001), Davies *et al.* (1994), Hennessey & Gómez (2003), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Miller (1963), Perry *et al.* (1997), Remsen & Traylor (1989), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robbins & Ridgely (1990), Salaman (1994), Salaman *et al.* (2002), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Weske (1972), Wetmore (1939), Zimmer (1930).

112. Southern Bristle-tyrant

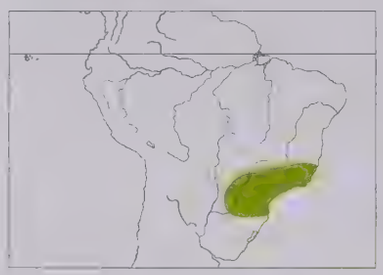
Pogonotriccus eximius

French: Tyranneau distingué **German**: Weißzügel-Laubtyrann **Spanish**: Orejerito Cejudo

Taxonomy. *Muscicapa eximia* Temminck, 1822, Ipanema, São Paulo, Brazil.

Genus previously merged with *Phylloscartes*, and that treatment retained by many authors; despite superficial similarities, however, the two groups differ significantly in foraging behaviour and postures, possibly also in details of nest (little known), and perhaps are not even closely related to one another. Monotypic.

Distribution. SE Brazil (S Mato Grosso E to Rio de Janeiro, S to Rio Grande do Sul), E Paraguay and NE Argentina (Misiones).



Descriptive notes. 11 cm; c. 7-8 g. Has grey crown with olive wash at centre, prominent white supraloral stripe and supercilium extending well behind eye, bordered below by blackish lores and stripe through eye back to sharply defined black auricular crescent; rest of face, auricular patch and rear border of facial crescent yellow; upperparts bright olive, wings dusky olive, wing-coverts and margins of remiges broadly but indistinctly edged yellowish-olive; tail olive; throat whitish, underparts bright yellow, breast lightly washed with olive; iris brown; bill short, pointed, black, paler at base of lower mandible; legs grey. Sexes alike. Juvenile undescribed. Voice. Sings and calls frequently with thin, chittery trills that end emphatically.

Habitat. Tropical evergreen and lower montane forest and forest borders, to c. 600 m, and temperate forest, including *Araucaria*-dominated forest and woodland.

Food and Feeding. Arthropods. Usually forages singly or in pairs, only rarely with mixed-species flocks. Perches in mid-storey of forest, posture upright with tail held vertically downwards; inconspicuous, except for frequent calling. Sallies are usually upwards to hover-glean from undersides of leaves.

Breeding. Sept-Jan. Nest bulky, oven-shaped, with side entrance, constructed mainly from mosses. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Uncommon to locally fairly common. Population concentrated principally in basin of R Paraná; has disappeared from São Paulo (Brazil), despite fact that tracts of suitable habitat remain. Occurs in several protected areas, e.g. Iguaçu and Serra da Canastra National Parks and Mata dos Godoy State Park (Paraná), in Brazil, Caaguazú, San Rafael and Ybycuí National Parks, Estancia Itabó Private Nature Reserve and Mbaracayú Forest Nature Reserve, all in Paraguay, and Iguazú National Park, in Argentina. Remaining forests, even within protected areas, suffer from agricultural conversion, mining, urbanization, industrialization, and associated road-building. Montane Atlantic Forest, however, has suffered less than have adjacent lowland forests, and the species' occurrence at these higher altitudes suggests that adequately large tracts of suitable habitat still exist.

Bibliography. Bertoni (1901), Brooks *et al.* (1993), Canevari *et al.* (1991), Clay, Tobias *et al.* (1998), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Dubs (1992), Hayes (1995), Lowen *et al.* (1996), Madroño & Esquivel (1995), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Parker *et al.* (1996), de la Peña (1988), Remold & Ramos Neto (1995), Ridgely & Tudor (1994), do Rosário (1996), Saibene *et al.* (1996), Sick (1993, 1997), Silveira (1998), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Traylor (1977), Willis & Oniki (1993).

113. Spectacled Bristle-tyrant

Pogonotriccus orbitalis

French: Tyranneau à lunettes **German**: Augenring-Laubtyrann **Spanish**: Orejerito de Anteojos

Taxonomy. *Capsiempis orbitalis* Cabanis, 1873, Monterico, Peru.

Genus previously merged with *Phylloscartes*, and that treatment retained by many authors; despite superficial similarities, however, the two groups differ significantly in foraging behaviour and postures, possibly also in details of nest (little known), and perhaps are not even closely related to one another. Forms a superspecies with *P. venezuelanus* and *P. lanyoni*. Monotypic.

Distribution. Locally in E Andes of extreme S Colombia S to E Ecuador, and from Peru (S from S Amazonas) S to Bolivia (La Paz, Cochabamba).



Descriptive notes. 11·5 cm; 8 g. Has grey crown, yellowish-white lores and prominent eyering; face and auriculars mottled yellowish, faintly bordered above and behind by indistinct blackish auricular crescent; upperparts olive; wings dusky, wing-coverts tipped pale yellow (two wingbars consisting of rows of distinct spots), remiges edged and tipped pale yellow; tail olive; entire underparts bright yellow, very lightly suffused with olive on breast; iris brown; bill long, pointed, blackish, most of lower mandible whitish to pinkish-white; legs grey. Sexes alike. Juvenile undescribed. Voice. Not very vocal; soft series of "tic" notes rising and falling slightly, sometimes given individually.

Habitat. Humid montane forest, especially in dark, wet ravines and on lower-elevation ridgetops below mossy cloudforest; remains in forest interior, rarely venturing to edges and clearings. Around 900 m in S Colombia, 700-1400 m locally in Ecuador; 600-1200 m in SE Peru, down to 500 m on foothill ridges.

Food and Feeding. Stomach contents from SE Peru contained 66 identified items: beetles (Coleoptera) 56%, homopteran bugs 12%, hymenopterans 23% (ants 12%, wasps 11%), spiders (Araneae) 6%, hemipterans 3%. Forages singly or in pairs, found less often in mixed-species flocks than are congeners and *Phylloscartes* species. Perches mainly in understorey, only rarely to mid-storey or upper branches; posture upright, tail held vertically downwards; frequently lifts or flicks one wing high overhead, then repeats with opposite wing; pauses on perch for 10-30 seconds.

Feeds with short, outward or upward, looping sallies to snatch or hover-glean insects from undersides of leaves, then rapid flight to new perch.
Breeding. Birds with enlarged gonads, and juveniles present, in Oct and Nov in SE Peru, suggesting season Sept-Dec. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally rare, but locally fairly common; easily overlooked. Fairly common in SE Peru; listed as "near-threatened" in Ecuador. Occurs in Pilón Lajas Biosphere Reserve and Madidi National Park, both in Bolivia.
Bibliography. Cory & Hellmayr (1927), Fitzpatrick & Stotz (1997), Graves (1988a), Hennessey, Herzog & Sagot (2003), Hilty & Brown (1986), Jácome (2002a), Meyer de Schauensee (1982), Remsen & Traylor (1989), Ridgely & Tudor (1994), Ridgely & Greenfield (2001), Stotz *et al.* (1996), Traylor (1977).

114. Venezuelan Bristle-tyrant

Pogonotriccus venezuelanus

French: Tyranneau du Venezuela **German**: Karibiklaubtyrann **Spanish**: Orejerito Venezolano

Taxonomy. *Pogonotriccus venezuelanus* Berlepsch, 1907, Puerto Cabello, Carabobo, Venezuela.
Genus previously merged with *Phylloscartes*, and that treatment retained by many authors; despite superficial similarities, however, the two groups differ significantly in foraging behaviour and postures, possibly also in details of nest (little known), and perhaps are not even closely related to one another. Forms a superspecies with *P. orbitalis* and *P. lanyoni*. Monotypic.
Distribution. Coastal cordillera (from Carabobo E to Distrito Federal) and interior mountains (S Aragua, S Miranda) of N Venezuela.



Descriptive notes. 11·5 cm; 8-9 g. Has grey crown, yellowish-white lores and prominent eyering; face and auriculars mottled yellowish, faintly bordered above and behind by indistinct blackish auricular crescent; upperparts olive, wings blackish, two broad pale yellow wingbars, remiges edged and tipped pale yellow; tail olive; throat and entire underparts bright yellow, very lightly suffused with olive on breast; iris brown; bill long, pointed, blackish, basal half of lower mandible whitish; legs grey. Sexes alike. Juvenile undescribed. Voice. Double-note call, "che-dip", and high, fast trill first descending and then ascending.
Habitat. Humid montane forest, especially wet, mossy cloudforest, at 950-1400 m.
Food and Feeding. Forages singly or in pairs, typically in mixed-species flocks (often also containing *P. ophthalmicus*). Perches in mid-storey and upper branches; posture upright, tail held vertically downward; frequently lifts or flicks one wing high, then repeats with opposite wing. Feeds with short, outward or upward, looping sallies to snatch or hover-glean insects from undersides of leaves, then rapid flight to new perch.
Breeding. No data. Season probably Jan-Apr/May.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Cordillera de la Costa Central EBA. Fairly common. Occurs in Henri Pittier National Park, and probably in other protected areas within its small range. Although extensive forest cover still exists in parts of its range, deforestation has been severe around residential areas, e.g. Caracas, as well as in many other areas.
Bibliography. Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Fitzpatrick & Stotz (1997), Graves (1988a), Hilty (2003), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stotz *et al.* (1996), Traylor (1977), Visbal *et al.* (1996).

115. Antioquia Bristle-tyrant

Pogonotriccus lanyoni

French: Tyranneau de Lanyon **German**: Antioquialaubtyrann **Spanish**: Orejerito Antioqueño

Taxonomy. *Phylloscartes lanyoni* Graves, 1988, El Pescado, Antioquia, Colombia.
Genus previously merged with *Phylloscartes*, and that treatment retained by many authors; despite superficial similarities, however, the two groups differ significantly in foraging behaviour and postures, possibly also in details of nest (little known), and perhaps are not even closely related to one another. Forms a superspecies with *P. orbitalis* and *P. venezuelanus*. Monotypic.
Distribution. E & N slopes of C Andes (in Antioquia and Caldas) and W slope of E cordillera (in Boyacá), in Colombia.



Descriptive notes. 11·5 cm; c. 8 g. Has grey crown, yellowish-white lores and prominent broken eyering; face and auriculars mottled yellowish, faintly bordered above and behind by indistinct blackish auricular crescent; upperparts olive, wings dusky, two broad bright yellow wingbars, remiges edged and tipped pale yellow; tail olive; entire underparts bright yellow, very lightly suffused with olive on breast; iris probably brown; bill long, pointed, blackish, basal half of lower mandible whitish; legs grey. Sexes alike. Juvenile undescribed. Voice. Unknown.
Habitat. Semi-deciduous foothill forest, at 450-900 m.
Food and Feeding. Forages singly or in pairs, often with mixed-species flocks. Little information; diet and behaviour presumably much as for closely related *P. orbitalis* and *P. venezuelanus*.
Breeding. Almost unknown. Nesting recorded in Mar, and family group observed in Jun.
Movements. Resident.
Status and Conservation. ENDANGERED. Restricted-range species: present in Nechí Lowlands EBA. Resticted to a 60-km stretch of middle Magdalena Valley in C Andes and W slope of E Andes in Colombia, and known from only six localities within total range of only c. 600 km². Estimated global population of a few thousands. The species occurs in the 0·2-km² watershed reserve of La Victoria (Caldas) and in the 1-km² Río Claro Reserve (Antioquia); latter helps to prevent human colonization of adjacent forested areas, but lies within an area of heavy logging activity. It is uncommon at El Vergel and common in the 4-km² forest at Monte del Diablo (both in Boyacá); recorded 10 km W of La Victoria, near Tasajos (Caldas). Threatened by rapid habitat loss and fragmentation due to logging, livestock-rearing, arable cultivation, infrastucture development, oil extraction and mining, although some extensive forests survive, and in some areas regeneration has begun following land abandonment. Dependence on undisturbed habitat unknown; has been observed in second growth and disturbed forest. Ecological requirements of this poorly known species urgently needed.
Bibliography. Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Gómez & Amaya (2002), Graves (1988a), Negret (2001), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stiles (1990), Stiles *et al.* (1999), Stotz *et al.* (1996), Vuilleumier *et al.* (1992), Wege & Long (1995).



PLATE 23

inches 3

cm 8

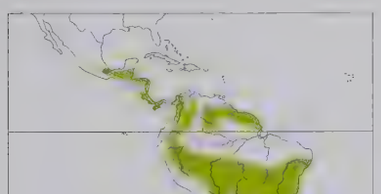
Genus *LEPTOPOGON* Cabanis, 1844

116. Sepia-capped Flycatcher

Leptopogon amaurocephalus

French: Pipromorphe à tête brune **Spanish**: Orejero Coronipardo
German: Braunkappen-Laubtyrann
Other common names: Sepia-capped Leptopogon

Taxonomy. *Lept[opogon] amaurocephalus* Tschudi, 1846, São Paulo, Brazil.
Races may be divided into three plumage types, "nominate group" (also including *pileatus* and *idius*), the single-taxon "*diversus* group" and "*peruvianus* group" (with *orinocensis*); these intergrade with one another, and many specimens from S Mexico closely resemble others from NE Argentina. Differences within populations exceed those alleged to occur among many of the named races; described taxon *faustus* (Nicaragua S to C Panama) indistinguishable from and merged with *pileatus*, and *obscuritergum* (S Venezuela in Amazonas and SE Bolívar) inseparable from and merged with *orinocensis*. Six subspecies recognized.
Subspecies and Distribution.
L. a. pileatus Cabanis, 1865 - humid lowlands from S Mexico and Yucatán Peninsula S to C Panama.
L. a. idius Wetmore, 1957 - Coiba I, off SW Panama.
L. a. diversus Todd, 1913 - NC Colombia (from Santa Marta region and Magdalena Valley S to Tolima) and extreme NW Venezuela (Zulia).
L. a. orinocensis J. T. Zimmer & Phelps, Sr, 1946 - Venezuela (from S Táchira, Barinas and Portuguesa E to Bolívar and Amazonas), the Guianas and N Brazil (Amapá).
L. a. peruvianus P. L. Sclater & Salvin, 1868 - E Colombia (S from Norte de Santander), E Ecuador, E Peru, N Bolivia (Beni, La Paz, Cochabamba), and W Brazil (Amazonas and Rondônia E to N Mato Grosso).
L. a. amaurocephalus Tschudi, 1846 - S & E Brazil (S from Mato Grosso, S Maranhão and Pernambuco), E Bolivia (Santa Cruz S to Tarija), Paraguay and NW & NE Argentina (S to Salta, Jujuy, Misiones and Corrientes).



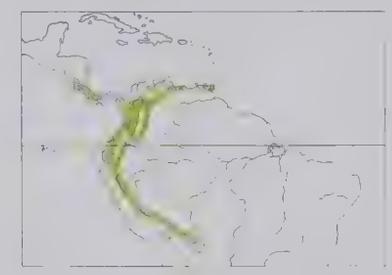
Descriptive notes. 13·5 cm; 12 g. Nominate race is warm buffy olive above, crown warm sepia-brown; lores mottled whitish; face and auricular patch mottled whitish to pale yellow, bordered posteriorly by broad dark brown facial crescent; wings dusky, most feathers edged dull yellow-green, outer webs of wing-coverts broadly tipped rich cinnamon-buff to pale yellowish-buff (wingbars appearing as two rows of elongated dots), outer edges of innermost remiges broadly cinnamon-buff to pale yellowish-buff; tail dusky olive; throat mottled greyish, merging with broad breastband flammulated with olive, darker breast streaks invade pale yellow underparts; thighs olive; iris medium greyish-brown; bill long, black, base of lower mandible pale grey; legs dark grey. Sexes alike, female on average slightly smaller than male. Juvenile resembles adult. Race *pileatus* has uppertail-coverts and tail strongly tinged warm cinnamon-brown; *idius* is similar to previous but greyer and paler throughout, wingbars less rufescent; *diversus* has upperparts pale dusky olive, underparts and breast flammulations pale; *peruvianus* is dark greyish above, crown darker olive, wingbars and wing edgings pale yellow, underparts pale yellowish-white; *orinocensis* differs from previous in paler, more yellow-grey, breast nearly lacking olive wash. Voice. Squeaky, explosive trill often preceded or followed by 1-2 sharp notes, "skeet-jt-jt-jt-jt-jt!" or "whik, whik, purrrrrrrrr" or ""prip-prrrrrrrip-pjit-pjit"; also softer, descending trill.
Habitat. Lowland tropical forests, from moist evergreen forest and gallery forest to deciduous woodland; in Amazonia, more common in *várzea* and river-edge forests than in interior *terra firme* forest; in S & E Brazil, occupies open woodlands and dense, humid brush. To 1100 m.
Food and Feeding. Arthropods; small fruit and berries also eaten. Two stomachs from Surinam packed with butterfly (Lepidoptera) remains; stomach contents from SE Peru contained 48 food items, of which ants (Hymenoptera) 46%, orthopterans 17%, homopteran bugs (planthoppers) 10%, beetles (Coleoptera) 8%, spiders (Araneae) 6%, pupae (6%), shield-bugs (Pentatomidae) 2%. Forages in shady, leafy settings, usually within 8 m of ground; often joins mixed-species flocks in forest understorey. Perches upright, pauses for 10-30 seconds to search mainly upwards; regularly lifts one wing high over back while perched (rarely, both wings, or one followed by the other). Snatches insect prey with upward hover-gleans and upward strikes.
Breeding. Season Feb-May in Middle America and Aug-Dec in S portion of range. Nest (in Mexico and Brazil) globular, with side entrance, made of fresh moss, dry moss, fine roots and grass, firmly lined with silky seed down, suspended on rootlet under protective log or ledge, often in ravine. Clutch 2-3 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Occurs in many national parks and other protected areas throughout its large range, e.g. Lamanai Archaeological and Columbia River Forest Reserves, in Belize, Laguna del Tigre National Park, in Guatemala, Tinigua National Park, in Colombia, Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, Madidi and Noel Kempff Mercado National Parks, Beni Biosphere Reserve and Pilón Lajas Biosphere Reserve, in Bolivia, Caaguazú, San Rafael, San Luis and Ybycuí National Parks, all in Paraguay, Iguaçu, Itatiaia, Serra da Canastra and Tijuca National Parks, all in Brazil, Cerro Corá National Park, in Uruguay, and Iguazú National Park, in Argentina. Much of its habitat remains in relatively pristine condition.
Bibliography. Anon. (1998a), Bates & Zink (1994), Begazo (1995), Belton (1985), Binford (1989), Brooks *et al.* (1993), Canevari *et al.* (1991), Chapman (1917c, 1926), Collins & McDaniel (1989), Cory & Hellmayr (1927), Di Giacomo & López (2000), Fitzpatrick (1980c, 1985b), Fjeldså & Maijer (1996), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Heinonen *et al.* (1995), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Hudson (1920), Land (1970), Lanyon (1988b), Lee Jones (2004), López *et al.* (1989), Lowen *et al.* (1996), Monroe (1968), Moore (1944), Munn (1985), Narosky & Salvador (1998), Olson (1997), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robinson (1997), Robinson & Terborgh (1997), do Rosário (1996), Sick (1993, 1997), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977), Wetmore (1972), Zimmer (1941c).

117. Slaty-capped Flycatcher

Leptopogon superciliaris

French: Pipromorphe à tête grise **Spanish**: Orejero Coronigrís
German: Schieferkappen-Laubtyrann
Other common names: Slaty-capped Leptopogon; White-bellied Leptopogon (*albidiventer*)

Taxonomy. *L[eptopogon] superciliaris* Tschudi, 1844, Montaña of Vitoc, Peru.
Most populations exhibit extraordinary individual variation (especially in colour of wingbars), even at a single locality, and majority of named races cannot be distinguished from one another; hence, *hellmayri* (Costa Rica and W Panama), *transandinus* (E Panama, W slope of W Andes of Colombia, W Ecuador), *poliocephalus* (C & E Andes of Colombia), *venezuelensis* (N Venezuela, from W Zulia E to Monagas) and *pariae* (extreme NE Venezuela in Sucre, and Trinidad) all merged with nominate. Transition to distinctive white-bellied race *albidiventer* occurs sharply in E Andes of C Peru, and both plumage types occur together from Ayacucho S to Cuzco; detailed genetic and vocal studies could demonstrate that they represent separate species. Two subspecies recognized.
Subspecies and Distribution.
L. s. superciliaris Tschudi, 1844 - mountains of Costa Rica and Panama, Colombia (all three cordilleras), Venezuela (Andes and coastal mountains, and Paria Peninsula), Trinidad, Ecuador (both slopes) and E Peru (S to Ayacucho).
L. s. albidiventer Hellmayr, 1918 - E Peruvian Andes (S from Ayacucho and Cuzco) and N Bolivia (La Paz, Cochabamba, W Santa Cruz).



Descriptive notes. 13·5 cm; 12 g. Nominate race is dark olive above, crown slaty grey; lores and narrow supercilium white, face and auricular patch mottled whitish, bordered posteriorly by broad black facial crescent; wings dusky, most feathers edged yellow-green, outer webs of wing-coverts broadly tipped rich cinnamon-buff to pale yellow (highly variable, mostly pale yellow to whitish in Venezuelan populations) and forming wingbars appearing as two rows of elongated dots; outer edges of innermost remiges broadly cinnamon-buff to pale yellow; tail dusky olive; throat mottled greyish, merging with broad breastband of flammulated greyish-olive, darker breast streaks invading pale yellow of rest of underparts; thighs olive; iris medium greyish-brown; bill long, black; legs dark grey. Sexes alike. Juvenile undescribed. Race *albidiventer* is greyish-olive above, wingbars mainly pale yellow, underparts whitish to pale yellowish-white, breast and flanks flammulated with grey, lacking olive tinge. Voice. Emphatic, nagging-sounding two-part call, beginning with sharp note and ending with rapid, ascending trill, "skee-drrrrrrrt" or "peet-yeeer"; also a series of sneeze-like notes, "hit-chu, hit-chu".
Habitat. Middle storey to lower canopy of mid-elevation, humid montane forest and foothills, occasionally near forest edge, rarely in second growth. To 2400 m.
Food and Feeding. Arthropods; also small fruit and berries. Stomach contents in SE Peru contained 108 food items, of which lepidopteran larvae 25%, beetles (Coleoptera) 22%, orthopterans 22%, homopteran bugs (planthoppers) 9%, ants (Hymenoptera) 8%, spiders (Araneae) 7%, hemipterans 5%, other items 2%. Forages in rather open but shady perches under forest canopy; often joins mixed-species flocks in mid-storey. Sits erect, tail held straight down, pauses for 5-30 seconds to search mainly upwards; regularly lifts one wing momentarily high over back (rarely, both wings, or one followed by the other). Snatches insect prey with upward hover-gleans and upward strikes.
Breeding. Poorly documented; breeds in Mar in Costa Rica and Feb-Jul in Trinidad. Nest globular, with rounded side entrance shielded by a visor, made of fibrous rootlets, lined with silky seed down, suspended on rootlet beneath protective log or ledge, almost always in ravine and near stream, sometimes directly over rushing torrent. Clutch usually 2 eggs; no information in incubation and fledging periods.
Movements. Resident; may descend to slightly lower elevations during cold months.
Status and Conservation. Not globally threatened. Rare to locally common. Probably locally extinct wherever deforestation has been intense, e.g. in lowland forest in W Chiriquí (Panama). Occurs in many national parks and other protected areas throughout its range, e.g. Darién National Park, in Panama, Macarao and Paria Peninsula National Parks, in Venezuela, Tambito Nature Reserve, Río Claro Reserve and Tinigua National Park, in Colombia, Machalilla National Park and about five other reserves in Ecuador, Machu Picchu Historical Sanctuary and Northwest Peru Biosphere Reserve, in Peru, and Madidi National Park and Pilón Lajas Biosphere Reserve, in Bolivia.
Bibliography. Anon. (1998a), Bates & Zink (1994), Begazo (1995), Belcher & Smooker (1937), Blake (1962), Bond *et al.* (1989), Chapman (1917c, 1921, 1926), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Fitzpatrick (1980c, 1985b), Fjeldså & Krabbe (1990), Herklots (1961), Hilty (1997, 2003), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1982), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Salaman (1994), Schulenberg *et al.* (2001), Skutch (1967), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Temple (2002), Traylor (1977), Walker (2001), Wetmore (1972), White (2002), Williams & Tobias (1994), Zimmer (1941c).

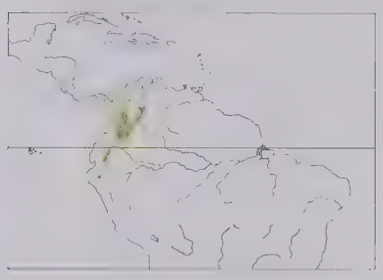
118. Rufous-breasted Flycatcher

Leptopogon rufipectus

French: Pipromorphe à poitrine rousse **Spanish**: Orejero Pechirrufo
German: Rostbrust-Laubtyrann
Other common names: Rufous-breasted Leptopogon

On following pages: 119. Inca Flycatcher (*Leptopogon taczanowskii*); 120. Streak-necked Flycatcher (*Mionectes striaticollis*); 121. Olive-striped Flycatcher (*Mionectes olivaceus*); 122. Ochre-bellied Flycatcher (*Mionectes oleagineus*); 123. McConnell's Flycatcher (*Mionectes macconnelli*); 124. Grey-hooded Flycatcher (*Mionectes rufiventris*); 125. Northern Scrub-flycatcher (*Sublegatus arenarum*); 126. Amazonian Scrub-flycatcher (*Sublegatus obscurior*); 127. Southern Scrub-flycatcher (*Sublegatus modestus*); 128. Slender-billed Tyrannulet (*Inezia tenuirostris*); 129. Plain Tyrannulet (*Inezia inornata*); 130. Amazonian Tyrannulet (*Inezia subflava*); 131. Pale-tipped Tyrannulet (*Inezia caudata*).

Taxonomy. *Tyrannula rufipectus* Lafresnaye, 1846, Colombia [= "Bogota"].
Forms a superspecies with *L. taczanowskii*. Birds from extreme NE of range described as race *venezuelanus*, but indistinguishable from populations farther S along Colombian Andes. Monotypic.
Distribution. Locally in extreme SW Venezuela (Táchira), E & C Andes of Colombia (S Antioquia and Cundinamarca S to W Caquetá), E Andes of Ecuador and extreme N Peru (Cerro Chinguela, in Piura).



Descriptive notes. 13 cm; 13 g. Has crown slate-grey, lores and face mottled cinnamon rufous, rufous auricular patch bordered posteriorly by dusky crescent; upperparts dark olive; wings dusky, indistinct wingbars and edges of remiges buffy; tail warm buffy olive; throat and broad breastband bright cinnamon-rufous, rest of underparts yellow, thighs cinnamon-olive; iris dark brown; bill long, black; legs dark grey. Sexes alike, female on average slightly smaller than male. Juvenile not described. VOICE. Loud, abrupt squeaky "spik" given 1-5 times, usually at intervals of at least 1 minute.
Habitat. Humid upper montane wet forest, especially mossy cloudforest; occasionally ventures to forest edge and second growth. At 1500-2700 m; most common above 1900 m.
Food and Feeding. Arthropods; small fruits and berries may also be eaten. Inconspicuous; forages from shady perches in mid-storey and lower canopy; sits erect, tail straight down, searches mainly upwards. Often joins mixed-species flocks in forest mid-storey. Snatches insect prey with upward hover-gleans and upward strikes.
Breeding. Not documented.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Rare to locally fairly common. Fairly common at Hacienda La Providencia and near Bramón-Las Delicias pass, both in Venezuela, also at Finca Merenberg and Cueva de los Guácharos National Park, both in Colombia, in all national parks along E slope of Ecuador, and at Cerro Chinguela, in Peru. Probably locally extinct in areas where deforestation has been intense, e.g. in C Colombia.
Bibliography. Bates & Zink (1994), Chapman (1917c, 1926), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Miller (1963), Parker *et al.* (1985), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977), Zimmer (1941c).

119. **Inca Flycatcher**

Leptopogon taczanowskii

French: Pipromorphe inca **German**: Graugesicht-Laubtyrann **Spanish**: Orejero Inca
Other common names: Inca Leptopogon

Taxonomy. *Leptopogon taczanowskii* Hellmayr, 1917, Ray-Urmana, Huayabamba Valley, 8000 feet [c. 2440 m], Amazonas, Peru.
Forms a superspecies with *L. rufipectus*. Present species originally named "*L. rufipectus*", but that name invalid, as preoccupied by its close relative. Monotypic.
Distribution. E Andes of Peru, from Amazonas and San Martín S to Cuzco.



Descriptive notes. 13 cm; 13 g. Plumage is olive above, crown darker brownish-olive; lores and face mottled whitish, whitish auricular patch bordered posteriorly by blackish facial crescent; wings dusky, outer webs of wing-coverts broadly tipped cinnamon (wingbars appearing as two rows of elongated dots), outer edges of innermost remiges broadly cinnamon-buff; tail warm dusky olive; throat greyish, merging with broad breastband of flammulated dark buffy olive, rest of underparts pale yellow, thighs olive; iris dark brown; bill long, black; legs dark grey. Sexes alike. Juvenile undescribed. VOICE. Sharp, excited "skwee" or "spik" given at irregular intervals or several times in succession.
Habitat. Humid upper montane forest, especially mossy cloudforest, occasionally venturing to edge or second growth. At 1400-2900 m; most common above 2000 m.
Food and Feeding. Arthropods; small fruits and berries may aso be eaten. Inconspicuous; forages from shady perches under forest canopy; sits erect, tail straight down, searches mainly upwards. Joins mixed-species flocks somewhat less often than do its congeners. Snatches prey with upward hover-gleans and upward strikes.
Breeding. Not documented.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in North-east Peruvian Cordilleras EBA. Uncommon to fairly common. Occurs in Río Abiseo and Yanachaga-Chemillén National Parks, Apurímac Reserved Zone, Alto Mayo Protected Forest and Machu Picchu Historical Sanctuary. Areas occupied by this species have been affected by widespread deforestation for cultivation, especially in Huallaga drainage, although cloudforests are relatively undisturbed.
Bibliography. Bates & Zink (1994), Chapman (1921), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hornbuckle (1999), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Stotz *et al.* (1996), Terborgh (1971), Traylor (1977), Walker (2001), Zimmer (1941c).

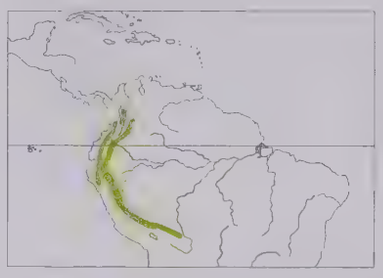
Genus *MIONECTES* Cabanis, 1844

120. **Streak-necked Flycatcher**

Mionectes striaticollis

French: Pipromorphe strié **Spanish**: Mosquero Gorgiestriado
German: Graukappen-Pipratyrann

Taxonomy. *M[uscicapa] striaticollis* d'Orbigny and Lafresnaye, 1837, Yuracarés, Bolivia.
Closely related to *M. olivaceus*. Proposed race *poliocephalus* (Pasco and Junín, in C Peru) merged with nominate, as it occupies an indistinct zone of intergradation between subspecifically recognizable plumage patterns of N & S Peru; similarly, *selvae* (W Andes of Colombia) merged with *columbianus*, as these populations occupy a zone of diffuse intergradation between grey-crowned latter race and green-crowned *viridiceps*. Four subspecies recognized.
Subspecies and Distribution.
M. s. columbianus Chapman, 1919 - Andes of Colombia (except SW) S to E Ecuador.
M. s. viridiceps Chapman, 1924 - W Andean slopes from SW Colombia S to SW Ecuador.
M. s. palamblae Chapman, 1927 - Andes of N Peru from Piura, Cajamarca and San Martín S to Huánuco.
M. s. striaticollis (d'Orbigny & Lafresnaye, 1837) - S Peru (S from Cuzco and Madre de Dios) S to N Bolivia (La Paz, Cochabamba, N Santa Cruz).



Descriptive notes. 13·5 cm; 13-17 g. Nominate race is dark olive above, crown and nape slaty grey; face and auricular area dark grey, feather shafts white; tiny white spot behind eye; wings olive, occasionally indistinct faint buffish-olive wingbars; tail olive; throat and upper breast slate-grey, feather shafts narrowly to broadly white (producing distinct fine streaks), lower breast and flanks sharply streaked dark olive and yellow, centre of belly yellow, thighs olive; iris dark brown; bill long, dark brownish-grey, base of lower mandible pale pinkish; legs dark grey. Sexes alike. Juvenile resembles adult. Race *palamblae* differs from nominate in having olive suffusion throughout grey of crown and face, grey of throat restricted to chin area, finer white shaft streaks on face and throat, more restricted streaking on breast and flanks, hence more extensively yellow belly; *viridiceps* has crown dark olive, face and auricular area dark grey, throat and upper breast olive with fine white streaks; *columbianus* has dark olive-grey crown (more washed with olive in W Andes), greyish-olive face and auriculars, grey throat and upper breast finely streaked white. VOICE. Very quiet. Said to give thin, wiry notes during breeding season; also soft wing-whirring sound, presumably produced by very thin, attenuated ninth primary of male.
Habitat. Humid upper tropical and lower temperate montane forest, secondary forest; less often out to borders and adjacent clearings with isolated fruit-bearing trees. Mostly 1300-2500 m, locally down to 600-900 m; occasionally higher into temperate zone, recorded to 3400 m. Upper-elevational replacement of *M. olivaceus*.
Food and Feeding. Arthropods and berries. Usually solitary; sometimes joins mixed flocks or aggregations of tanagers (Thraupidae) and other birds at fruiting trees, but not a regular member of mixed-species flocks. Forages in forest understorey to subcanopy, usually in trees, but also in bushes, tangled thickets and dead shrubbery; perches upright, at times leaning forwards and bowing head, sometimes flicking single wing up over back. Hover-gleans among foliage, occasionally making short sallies for flying insects or to pick off a small fruit while hovering, returning to cover immediately after. Outside breeding season spends much time in picking berries in canopy.
Breeding. Males in breeding condition in Jan-Apr in Colombia and Sept-Dec in SE Peru; fledglings and juveniles in May and Jun in Colombia, Jan and Feb in NE Ecuador, Apr and May in Peru, and Mar, Aug and Dec in Bolivia; males singing Jan-May in Colombia and Jan in NE Ecuador. Partially lekking species, some males displaying solitarily; leks consist of 2-6 males on small territories 10-30 m across and within hearing range of one another (one in NE Ecuador had at least six birds in 0·5 ha), generally in primary or secondary forest, often near stream or river in tangled vines and dense undergrowth; male sings throughout morning from perches 1-6 m above ground, snapping head rapidly sideways with each song, bill swings sharply to side and upwards with each stroke, in synchrony with song units; uses many perches, singing on one for 30 seconds to 2 minutes, then making direct flight to new perch and singing immediately upon landing; lek-owner responds aggressively to intruders with active chase. Nest pendent, elongate, pyriform, with side entrance often slightly hooded, covered with moss, "tail" of plant fibres hanging loosely below, interior lined with soft seed down, dry moss and pale fibres, strands of hanging moss sometimes obscuring entrance; suspended from thin vine, rootlet or drooping twig 0·8-3 m above ground or small stream, often the vine or rootlet connected to more substantial substrate both above and below attachment point of nest; located inside tangle of vegetation or in more exposed site, in NE Ecuador all but one within 5 m of small stream inside intact mossy, epiphyte-laden forest with canopy height 15-25 m and characterized by thick understorey (one nest in highly disturbed forest, lacking canopy cover but covered by dense *Chusquea* bamboo averaging 3 m tall). Clutch size 2-3 eggs, laid one day apart; incubation daily coverage from 48% during first few days to 83%, incubation period (from last egg) 19 days; when approaching nest with eggs, female skulks low, well concealed in thick vegetation, until within several metres, then flies directly into nest, pausing only briefly on rim of entrance; eggs hatch synchronously; chick faecal sacs often bright purple-white, sometimes contain *Miconia* and *Myrica* seeds; nestling period at least 18 days.
Movements. Resident.
Status and Conservation. Not globally threatened. Considered generally common to locally uncommon. Occurs in all protected areas within its distributional limits. Not believed to be at any potential risk.
Bibliography. Butler (1979), Clements & Shany (2001), Cory & Hellmayr (1927), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hilty & Brown (1986), Hornbuckle (2000), Meyer de Schauensee (1966, 1982), Miller (1963), Moynihan (1979), Remsen (1985), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Schulenberg *et al.* (2001), Sclater & Salvin (1879), Stotz *et al.* (1996), Walker (2001), Williams & Tobias (1994), Zimmer (1930, 1941c).

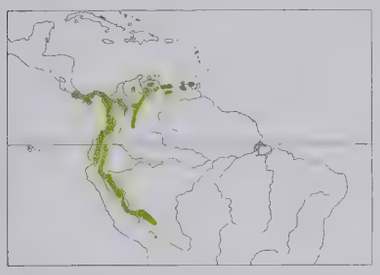
121. **Olive-striped Flycatcher**

Mionectes olivaceus

French: Pipromorphe olive **German**: Olivkopf-Pipratyrann **Spanish**: Mosquero Oliváceo

Taxonomy. *Mionectes olivaceus* Lawrence, 1868, Barranca, Costa Rica.
Closely related to *M. striaticollis*. Populations vary along two N-S clines, one from Costa Rica S to W Ecuador and the other following E base of mountains from NE Venezuela and Trinidad S to Bolivia; described race *improvisus* (N Cauca Valley) merged with *hederaceus*, as intermediate within W cline; *pallidus* (E Andes of Colombia in Magdalena and N Meta) and *meridae* (NW Venezuela and adjacent NE Colombia) are indistinct, intermediate forms within E cline, both treated as synonyms of *venezuelensis*. Five subspecies recognized.

Subspecies and Distribution.
M. o. olivaceus Lawrence, 1868 - E Costa Rica and W Panama.
M. o. hederaceus Bangs, 1910 - Panama (E from Veraguas), N & W Colombia (Cauca Valley, W slope and lowlands) and W Ecuador (S to Loja).
M. o. galbinus Bangs, 1902 - Santa Marta region of N Colombia.
M. o. venezuelensis Ridgway, 1906 - N Venezuela and S along E base of Andes to S Colombia; also Trinidad.
M. o. fasciaticollis Chapman, 1923 - E base of Andes from S Colombia S to S Peru and extreme N Bolivia.

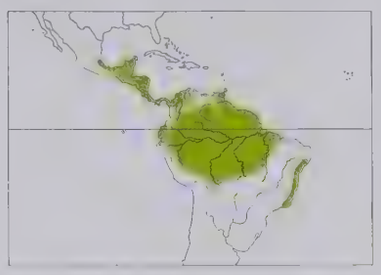


Descriptive notes. 13·5 cm; 12 g. Nominate race has crown and nape, face and auricular area dark olive, feather shafts of face white, conspicuous white spot behind eye; upperparts warm yellow-green, wings and tail dusky olive; throat and upper breast densely streaked dark olive and yellowish-white, feather shafts narrowly to broadly white (distinct, fine streaks), lower breast and flanks sharply streaked dark olive and yellow, centre of belly yellow, thighs olive; iris dark brown; bill long, dark brownish-grey, base of lower mandible pale pinkish; legs dark grey. Sexes similar. Juvenile resembles adult. Race *hederaceus* has upperparts darker than nominate, throat streaks more pronounced whitish and dark greyish-olive, belly paler yellowish-white; *galbinus* has paler yellow-green upperparts, throat streaks very fine and bright yellow, entire underparts bright yellow; *venezuelensis* is slightly darker green above, even darker on crown, paler yellow below; *fasciaticollis* is uniform dark olive above, richer yellow below. Voice. Very quiet except in breeding season, when lekking male endlessly repeats a series of 3-4 very high, thin notes; sometimes delivered in small; loose groups.
Habitat. Lower and middle growth of humid forest, shady secondary woodland, and forest borders and plantations; most common in foothills and subtropical zone, especially preferring damp shady undergrowth in ravines, with heavy understorey growth. Mostly 500-1600 m, but recorded to 3000 m in Panama, Colombia and Venezuela, locally down to sea-level in NW South America; scarce below 600 m in E Ecuador, but common at 300 m in SE Peru. Mainly at lower elevations than *M. striaticollis*, but the two occur together at some sites, mostly between 1200 m and 1700 m.
Food and Feeding. Mainly frugivorous, known to eat fruits of *Trema*, *Heliconia*, *Urera*, and melastomes (Melastomataceae); arthropods also taken. Solitary, quiet, inconspicuous; forages in understorey, especially in densely vegetated areas under deep shade; perches for long periods upright, but often hunching and nodding head anxiously, and flicking one or both wings irregularly. Small berries in undergrowth taken by hover-gleaning under foliage or clinging momentarily to leaves; may forage also by hanging downwards from underside of a twig. Arthropods usually taken with upward hover-gleans.
Breeding. Eggs in Apr-May in Costa Rica; males in breeding condition in Apr and juveniles in Jul in Colombia; nests in Feb-Jun in Trinidad. In contrast to congeners, both sexes have been observed at nest-site, and this species may be monogamous: during breeding season, males appear to establish scattered individual singing territories in upper understorey. Nest pyriform, with side entrance, covered externally with green moss, round central chamber lined with soft pale brown fibres, suspended from free-hanging vine or aerial roots, often beside vertical cliff, bank or base of large tree, generally not more than 1-2 m above ground. Clutch 2-3 eggs; no information on incubation and fledging.
Movements. Descends to lowlands during non-breeding season in Costa Rica, probably also in Andes.
Status and Conservation. Not globally threatened. Fairly common to common, sometimes abundant; often the most common bird in mist-nets in Peruvian forested foothills at 350-500 m. Occurs in several national parks and other protected areas in all countries in its range.
Bibliography. Allen (1995), Anon. (1998a), Belcher & Smooker (1937), Blake (1958), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), ffrench (1991), Foster & Johnson (1974), Haffer (1975), Herklots (1961), Hilty (1997, 2003), Hilty & Brown (1986), Hornbuckle (2000), Meyer de Schauensee (1966, 1982), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Robinson & Terborgh (1997), Salaman (1994), Schulenberg *et al.* (2001), Sherry (1983), Slud (1960, 1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Temple (2002), Wetmore (1939, 1972), Williams & Tobias (1994), Zimmer (1930, 1941c).

122. Ochre-bellied Flycatcher
Mionectes oleagineus

French: Pipromorphe roussâtre **Spanish**: Mosquero Aceitunado
German: Ockerbauch-Pipratyrann
Other common names: Oleaginous Flycatcher/Pipromorpha

Taxonomy. *M[uscicapa] oleaginea* M. H. K. Lichtenstein, 1823, Bahia, Brazil.
Closely allied to *M. macconnelli* and *M. rufiventris*; the three were for long placed in a separate genus, *Pipromorpha*, on basis of specialized outer primaries of male, but they share numerous characters (including unusual lek breeding system) with both *M. striaticollis* and *M. olivaceus*. Races fall into two groups according to plumage, the "*assimilis* group" and the "nominate group". Variation within former sufficient to warrant retention of several names, but *obscurus* (El Salvador), *dyscolus* (W Costa Rica and extreme W Panama) and *lutescens* (W Panama, including Coiba I) merged with *assimilis*, because they represent barely discernible intermediate forms within a broad N-S cline. Geographical variation across widespread "nominate group" exceedingly minor, while individual, age-specific and sexual variation considerable; described races *intensus* (SE Venezuela and W Guyana), *wallacei* (the Guianas, NE & E Amazonian Brazil E of R Negro), *chloronotus* (Amazon Basin), *hauxwelli* (E Ecuador and NE Peru N of Amazon) and *maynanus* (EC Peru S to Pasco) all treated as synonyms of nominate. Seven subspecies recognized.
Subspecies and Distribution.
M. o. assimilis P. L. Sclater, 1859 - humid lowlands from S Mexico (Veracruz, Tabasco, Yucatán Peninsula) S to E Costa Rica and W Panama.
M. o. parcus Bangs, 1900 - E Panama (E from Canal Zone) E to N Colombia and NW Venezuela (Zulia, Táchira, Mérida).
M. o. abdominalis (Phelps, Sr & Phelps, Jr, 1955) - N Venezuela (Distrito Federal and Miranda E to Cerro Negro).
M. o. pacificus (Todd, 1921) - W of Andes in SW Colombia and W Ecuador.
M. o. pallidiventris Hellmayr, 1906 - NE Venezuela (Sucre and N Monagas S through Delta Amacuro), Trinidad and Tobago.
M. o. dorsalis (Phelps, Sr & Phelps, Jr, 1952) - Cerros Chimantá and Roraima, in S Venezuela.
M. o. oleagineus (M. H. K. Lichtenstein, 1823) - E Colombia, S Venezuela, the Guianas and all of Amazonia S to E Ecuador, E Peru and N Bolivia (Beni, Cochabamba), and in C & SE Brazil (from N Mato Grosso E to Maranhão and Bahia, and coastal region from Alagoas S to Rio de Janeiro).



Descriptive notes. 13 cm; 12-14 g. Nominate race is uniform olive, tinged ochraceous, above; wings and tail ochraceous olive, greater and median wing-coverts olive, indistinctly edged rufous-buff, innermost 3-4 remiges conspicuously edged rufous-buff; throat grey, entire underparts rich cinnamon-buff, upper breast variably suffused with ochraceous olive, grading into deep cinnamon-buff belly; iris dark brown; bill long, dark brownish-grey, base of lower mandible variable, from pale pinkish to dark brownish; legs dark grey. Sexes similar. Juvenile resembles adult. Race *pallidiventris* is slightly paler above and less ochraceous below than nominate; *dorsalis* has darker olive back and paler ochraceous belly; *assimilis* has wings and tail dusky olive, olive wing-coverts only faintly edged dull buffy rufous, innermost remiges only narrowly edged buffy, underparts more yellowish-buff, upper breast variably suffused with dark greyish-olive, grading into pale rusty buff belly; *parcus* has limited pale grey on throat, pale orangey-buff underparts; *pacificus* differs from last in brighter yellowish-green upperparts, buffy rump, even paler and more yellowish underparts; *abdominalis* has duller, pale buff-brown abdomen. Voice. Very quiet except during breeding season, when male on lek gives endless series of high, thin, wiry "pééor" notes while flying nervously and repeatedly from one perch to another.
Habitat. Lower growth of humid tropical lowland forest, second-growth woodland, gallery forest, and borders and adjacent clearings and gardens, often along forest streams, also plantations with scattered shade trees, sometimes several hundred metres beyond edge of neighbouring forest. Found in both *terra firme* and *várzea* forests, and in sandy-belt forests inside Amazonia. Less frequent inside primary forest and mostly restricted to second-growth and edge habitats in areas where sympatric with *M. macconnelli*. Most common in humid lowlands, but recorded up to 1800 m.
Food and Feeding. Largely frugivorous, but also consumes insects and arthropods. Berries of mistletoe (Loranthaceae) especially favoured; fruits of variety of other plants also eaten, including *Trema micrantha*, *Miconia myriantha*, *Protium heptaphyluum*, *Sloanea stipitata*, *Sapium aucuparium*, *Maprounea guianensis*, *Hieronyma caribaea* and *Cordia currassavica*, genera *Zanthoxylum*, *Alchornea*, *Siparuna*, *Farmea*, *Heliconia* and *Cephaelis*, and families Araliaceae, Araceae, Palmae, Melastomataceae, Euphorbiaceae, Ulmaceae, Guttiferae, Burseraceae, Tiliaceae, Boraginaceae. Unobtrusive and quiet, and generally solitary. Forages mostly in understorey and lower canopy, to 10 m above forest floor; occasionally accompanies mixed flocks to higher levels of forest. Makes short hover-gleans, and perch-gleans within foliage to pluck small insects, berries, small fruits, and arillate seeds; also drops to ground to pluck insects and spiders (Araneae) from fallen branches. Fruits swallowed whole; larger seeds regurgitated, small seeds pass through gut.
Breeding. Eggs in Jun in Honduras, Mar-Aug in Costa Rica and May-Jul in Trinidad and Tobago; birds in breeding condition in Feb-Jun in Colombia and Aug-Dec in SE Peru; males on lek territories in Mar-Jul in Costa Rica, Feb-Sept in Trinidad and Mar-Jun in Tobago. About 50% of males display in "exploded" leks, the rest display solitarily or act as floaters; leks mainly along ridge lines, under closed canopy, with few plants 1-3 m tall; 2-6 (mean 3) males at lek, generally 18-50 m apart (6 males within 0·5 ha in Costa Rica), each display territory c. 10-30 m in diameter; male uses many perches, usually 3-10 m off ground, sings persistently throughout day, flicking wings one at a time, ruffling crown feathers, flies from perch to perch, chases off intruders immediately; visiting females elicit increased calling rate and exaggeration of wing flicks, female also rapidly flicks wings; three displays by male, (1) hopping rapidly between different perches, (2) fluttering flight in steep arc between two perches, (3) hovering and fluttering 0·6-1 m above ground for nearly 1 minute in dense cover near low perch. Females nest asynchronously; nest built by female, pyriform, 30-36 cm long, 7·5 cm across at widest point, side entrance hole sometimes screened by projecting canopy or porch, entire nest camouflaged with mosses or liverworts, thread-like brown detritus up to 1 m long hanging from bottom, egg-chamber lined with long strands of black material resembling horsehair (possibly rhizomes); nest suspended from aerial root or vine or from side of bank or tree trunk, usually no more than 4 m above ground, often over stream, also in undercut side of quarry or on underside of heavy fallen log. Clutch 2-5 eggs, usually 3, laid at 2-day intervals; incubation by female, period 18-21 days; chicks fed by female, by regurgitation, nestling period not documented. Breeding success low, only 12% of nests started produce fledged young.
Movements. Resident; local densities vary seasonally, probably according to fruit abundance. In one study, females moved on average 1855 m during day, and single movements of up to 1400 m observed; two types of movement bouts described, slow, exploratory movements associated with foraging, and longer, directional shifts.
Status and Conservation. Not globally threatened. Uncommon to common, locally abundant. Occurs in numerous national parks and other protected areas throughout its range. Average home range of female 28 ha in one study. Reasonably adaptable species, found in secondary and disturbed habitats as well as in pristine forest.
Bibliography. Anon. (1998a), Belcher & Smooker (1937), Binford (1989), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), ffrench (1991), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Henderson (2002), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Lee Jones (2004), Meyer de Schauensee (1966, 1982), Moermond & Denslow (1985), Monroe (1968), Munn (1985), Olson (1997), Payne (1984), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Robinson & Terborgh (1997), Salaman (1994), Sclater & Salvin (1879), Sherry (1983), Sick (1993, 1997), Skutch (1960, 1976, 1985), Slud (1964), Snow & Snow (1979), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Thurber *et al.* (1987), Tostain *et al.* (1992), Westcott (1992, 1993, 1994, 1997a, 1997b), Westcott & Graham (2000), Westcott & Smith (1994, 1997), Wetmore (1972), White (2002), Wiedenfeld *et al.* (1985), Willis (1980), Willis *et al.* (1978), Wright *et al.* (1985), Zimmer (1941c).

123. McConnell's Flycatcher
Mionectes macconnelli

French: Pipromorphe de McConnell **Spanish**: Mosquero de McConnell
German: Schwarzschnabel-Pipratyrann

Taxonomy. *Pipromorpha oleaginea macconnelli* Chubb, 1919, Kamakabra River, Guyana.
Scientific name was incorrectly formed, as species is named after F. V. McConnell. Closely related to *M. oleagineus* and *M. rufiventris*; all three were for long placed in a separate genus, *Pipromorpha*,

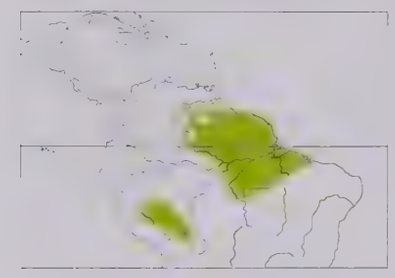
on basis of specialized outer primaries of male, but they share numerous characters (including unusual lek breeding system) with both *M. striaticollis* and *M. olivaceus*. Large series of specimens (including fresh ones) now available from across Amazon Basin S to Bolivia reveal remarkably little geographical variation over such a vast area, especially in comparison with distinctly different C Peruvian *peruanus*; described race *amazonus*, from C Brazil and E Bolivia, considered better treated as synonymous with nominate. Birds from Cerro de la Neblina (S Venezuela) named as race *mercedesfosterae*, but characters fall within range of variation of *roraimae*, thus merged with latter. Three subspecies recognized.

Subspecies and Distribution.

M. m. macconnelli (Chubb, 1919) - lowland tropics of E Venezuela (NE Bolívar), the Guianas and lower Amazonian Brazil (E from R Negro and R Madeira, possibly from Amazonas, S to N Mato Grosso and C Pará). SE Peru (S Ucayali, Madre de Dios; also sight record from R Javari, in NE) and NE Bolivia (Pando, Beni, La Paz, Cochabamba, Santa Cruz).

M. m. roraimae (Chubb, 1919) - tepui region of S & SE Venezuela and Guyana.

M. m. peruanus (Carriker, 1930) - C Peru (Junín).



Descriptive notes. 13·5 cm; 13-14 g. Nominate race is uniform olive above; wings and tail entirely dusky olive; rich cinnamon-buff below, throat and upper breast suffused with dark greyish-olive; iris dark brown; bill long, dark brownish-grey, base of lower mandible pale pinkish, mouth-lining black; legs medium brownish-grey. Distinguished from extremely similar *M. oleagineus* mainly by lack of buffy tips on tertials. Sexes similar. Juvenile resembles adult. Races differ mainly in degree of ochraceous tinge throughout: *roraimae* is brighter greenish-olive above, but darker cinnamon below; *peruanus* is much brighter olive and tinged ochraceous above, greater wing-coverts edged cinnamon, paler and brighter buffy orange below, chin and upper throat lightly tinged olive. Voice. Displaying male gives widely spaced or repeated series of nasal "wiib" notes, often in long succession.

Habitat. Lower growth of humid forest, primarily *terra firme*, but also in forest plantations, second growth, and river-flooded or tide-flooded *várzea* forest (e.g. at Belém, in Brazil). Mostly below 500 m, but mainly 1000-2000 m in Venezuela, and recorded to 2400 m in Bolivia.

Food and Feeding. Arthropods; also feeds extensively on understorey fruits (e.g. Rubiaceae, Melastomataceae). Regularly joins mixed flocks of small insectivores in understorey, but not an obligate mixed-flock species. Forages 1-25 m above forest floor; perches inconspicuously in shaded areas; makes short hover-gleans in foliage.

Breeding. Eggs in Jan-Mar in N Brazil, and birds in breeding condition in Sept-Nov in SE Peru. Sings and displays 1-2 m above ground, often near base of buttressed tree, sometimes while foraging with flocks near display grounds; small, dispersed leks roughly 50 m wide, on gentle slopes near forest creeks, individual callers separated by 50-100 m or more; displays include fluttering short flights and hovering, also periodically flashing out one wing or the other. Nest a leafy or strand ball with side entrance, variable in materials and appearance, short entrance tunnel inclines up to central nest cup of soft material; suspended on vine or at tip of twig 1-1·5 m above pool or small forest stream. Clutch 3 eggs, laid 2 days apart; incubation c. 19 days; chick growth rate slow, weight gain from 1·5 g at hatching to 12-13 g takes 10 days, fledging occurs 17-20 days after hatching of last young. Adults make no attempt to protect nest.

Movements. Apparently resident, although mist-net capture frequencies vary seasonally in SE Peru.

Status and Conservation. Not globally threatened. Uncommon to locally common. Nesting density unusually high, occupied nests may be only 100-200 m apart along small creeks. Occurs in many national parks and other protected areas throughout its range, e.g. Jaú and Tapajós National Parks and Ducke Reserve, in Brazil, Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, and Beni and Pilón Lajas Biosphere Reserves and Madidi National Park, in Bolivia. Much of this species' habitat remains in good condition.

Bibliography. Allen (1995), Angehr & Aucca (1997), Blake (1950), Chapman (1931), Chubb (1919), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Cracraft (1985), Dickerman & Phelps (1987), Fjeldså & Krabbe (1990), Gilliard (1941), Green (1998), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Mayr & Phelps (1967), Meyer de Schauensee (1966, 1982), Naka (2004), Oren & Parker (1997), Payne (1984), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992), Traylor (1977), Willard *et al.* (1991), Willis *et al.* (1978), Zimmer (1941c).

124. Grey-hooded Flycatcher

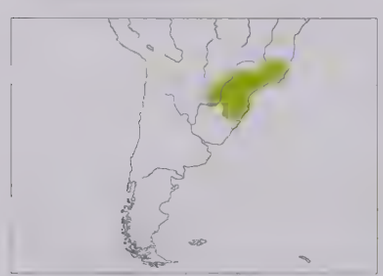
Mionectes rufiventris

French: Pipromorphe à ventre roux **Spanish**: Mosquero Ladrillito
German: Graukopf-Pipratyrann

Taxonomy. *Mionectes rufiventris* Cabanis, 1846, Brazil.

Closely allied to *M. oleagineus* and *M. macconnelli*; the three were for long placed in a separate genus, *Pipromorpha*, on basis of specialized outer primaries of male, but they share numerous characters (including unusual lek breeding system) with both *M. striaticollis* and *M. olivaceus*. Monotypic.

Distribution. SE Brazil (S Minas Gerais and Espírito Santo S to Rio Grande do Sul), SE Paraguay and NE Argentina (Misiones).



Descriptive notes. 13·5 cm; 14 g. Has crown, nape and entire face uniform slate-grey, upperparts dark olive, wings and tail entirely dusky olive; chin and throat pale grey (completing the grey "hood"), grading through buffy olive on lower breast to bright cinnamon-buff on belly, flanks and undertail-coverts; iris dark brown, bill long, dark brownish-grey, base of lower mandible pale pinkish; legs medium brownish-grey. Sexes alike. Juvenile undescribed. Voice. Displaying male gives series of odd, low nasal "bayo" notes resembling those of antshrikes (*Thamnophilus*), starting slowly, then accelerating before abruptly stopping; a second type of vocalization consists of a series of "wiib" notes, similar to alarm calls of Pale-breasted Thrush (*Turdus leucomelas*). Calls usually given from perch 3-8 m above ground.

Habitat. Lower growth of humid forest, also secondary woodland and borders; sea-level to c. 1000 m.

Food and Feeding. Insects and fruit. Forages in shady understorey of forest; perches for long periods, bobs head; often flicks one or both wings in agitated manner, as if wanting to lift them. Most food items obtained by hover-gleaning; occasionally sallies out to capture aerial insects.

Breeding. Eggs in Feb in S Brazil and Sept-Oct in Argentina; birds in breeding condition in Dec and males singing on territories at end of Aug-Jan dry season in SE Brazil. Some males sing in dispersed leks of two or three individuals, 33% display solitarily; singing persists until late morning from perches 2-4 m above forest floor, separated by 30 m from other males; displays most active in morning, decreasing in afternoon; intruding non-territorial males (more common on less active lek sites) either chased by territory-owner, or latter gives "tail-cocked" display in which he approaches intruder, faces in opposite direction and raises tail (exposing ochraceous undertail-coverts) while simultaneously dropping wings and vibrating them rapidly, then follows intruder through understorey, whole display lasting for less then 1 minute; another display is 30-second series of jumps 20-30 cm high, accompanied by wing-flicking, sometimes with hovering, returning to same position on horizontal twig 1 m above ground. Nest an elaborate elongate, pyriform structure, side entrance with small projecting roof, almost entirely covered with living moss, rounded nest-chamber lined with blackish fibres and covered by layer of soft straw, attached to pendant vine with fungal rhizomes, c. 2 m up and usually hanging over small stream; one record of abandoned nest of *Leptopogon amaurocephalus* being used. Clutch usually 3 eggs; no information on incubation and fledging periods.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to fairly common. Especially common around Iguazú Falls, on Argentina-SE Brazil border. Occurs in various protected areas, including at least seven national parks, throughout range.

Bibliography. Aguilar *et al.* (2000), Belton (1985), Bencke (1995), Brooks *et al.* (1993), Canevari *et al.* (1991), Castelino & Saibene (1989), Chapman (1917c, 1926), Cory & Hellmayr (1927), Cracraft (1985), Guerra & Marini (2002), Guix (1995), Hayes (1995), Lowen *et al.* (1996), Meyer de Schauensee (1966, 1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Oniki & Willis (1983b), de la Peña (1979, 1988), Pizo & Aleixo (1998), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Venturini *et al.* (2001).

Genus *SUBLEGATUS* P. L. Sclater & Salvin, 1868

125. Northern Scrub-flycatcher

Sublegatus arenarum

French: Tyranneau des palétuviers **Spanish**: Mosquero Matorralero Norteño
German: Nördlicher Strauchtyrann
Other common names: Smooth Scrub-flycatcher (South American races combined)

Taxonomy. *Elainea* [sic] *arenarum* Salvin, 1863, Punta Arenas, Costa Rica.

Unpublished molecular data suggest that genus is closely related to *Suiriri islerorum*. All members of genus formerly treated as conspecific, but vocal and plumage data support existence of three species, possibly more; additional study needed in order to resolve species limits. Nominate race (perhaps with *atrirostris*) possibly a separate species from others. Race *tortugensis* doubtfully distinct from *pallens*. Six subspecies recognized.

Subspecies and Distribution.

S. a. arenarum (Salvin, 1863) - Costa Rica and W Panama.

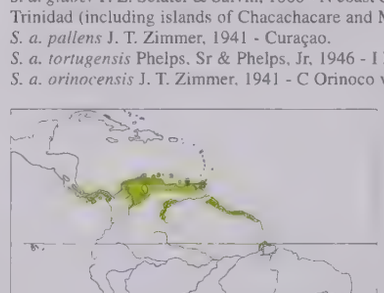
S. a. atrirostris (Lawrence, 1871) - Pearl Is (off S Panama) and N Colombia.

S. a. glaber P. L. Sclater & Salvin, 1868 - N coast of Venezuela (including Margarita I and Patos I), Trinidad (including islands of Chacachacare and Monos) and N parts of the Guianas.

S. a. pallens J. T. Zimmer, 1941 - Curaçao.

S. a. tortugensis Phelps, Sr & Phelps, Jr, 1946 - I La Tortuga, off N Venezuela.

S. a. orinocensis J. T. Zimmer, 1941 - C Orinoco valley in S Venezuela and E Colombia.



Descriptive notes. 13-15 cm; 10·5-15 g. Nominate race has narrow whitish supercilium, greyish-brown crown and upperparts; wings dusky grey, paler greyish to whitish wingbars and flight-feather edges; tail dusky, tips of fresh rectrices whitish; chin whitish, throat and chest pale grey, abdomen medium yellow; iris dark brown; bill short, stubby, black; legs grey. Separated from congeners by comparatively longer bill, pale grey breast sharply demarcated from bright yellow belly and abdomen. Sexes alike, female on average smaller than male. Juvenile resembles adult. Races differ only very slightly: *glaber* is larger than nominate, darker olive-brown above, crown feathers somewhat elongated and slightly darker than back, wingbars duller; *atrirostris* differs from previous in paler, more grey-brown upperparts, more conspicuous white wingbars, duller white throat, paler grey breast and flanks; *pallens* is similar to last but even paler, more grey above, throat and breast whiter, also slightly smaller; *tortugensis* is even whiter on throat and possibly smaller than previous; *orinocensis* is palest and smallest, with more sharply defined pale wingbars and edges of remiges. Voice. Dawn song a loud, repeated "pfweéé"; also widely spaced "phew!-dit" shortly after dawn; contact call a squeaky "peee" (as produced by squeezing a rubber toy), often given in couplets with mate.

Habitat. Mangroves and adjacent vegetation, including scrubby second growth. In N Venezuela (*glaber*) found in mangroves, open dry scrub, cactus and thorn woodlands, and desert areas; *atrirostris* and *orinocensis* mainly in scrubby second growth and dry woodland. Sea-level to 600 m.

Food and Feeding. Food arthropods, including ants (Hymentoptera), caterpillars (Lepidoptera), small beetles (Coleoptera); small berries also frequently taken. Forages inconspicuously in shrubs and small trees, perching upright with tail vertically downwards; makes long pauses and peering head movements; food items obtained by outward hover-gleans to vegetation and short aerial sallies.

Breeding. Mar-Jun; stub-tailed young in Aug, Colombia. Nest a simple cup, 7·5 cm × 4 cm, placed 2-6 m up in fork of small tree. Clutch 2 eggs; incubation period at least 14 days, female fed on nest by male; no information on nestling period.

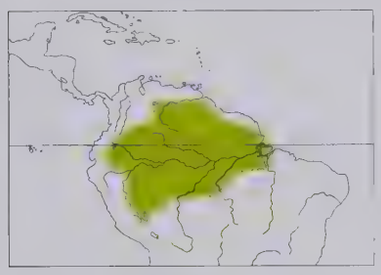
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. In Panama, most abundant near coast and fairly common on several islands and in the Tocumen area; especially common in Salamanca National Park, in Colombia, and occurs also in Carara Biological Reserve, in Costa Rica. Populations inhabiting second growth and open, dry woodland may presumably benefit from degradation of primary forest; those in mangroves more at risk as a result of widespread destruction of this habitat.
Bibliography. Anon. (1998a), Bond *et al.* (1989), Chapman (1894), Cherrie (1916), Cory & Hellmayr (1927), ffrench (1991), Fitzpatrick (1980c), Friedmann (1948), Friedmann & Smith (1950), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes & Samad (2002), Herklots (1961), Hilty (2003), Hilty & Brown (1986), LeCroy (1976), Olson (1997), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Slud (1964, 1980), Snyder (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Temple (2002), Tostain *et al.* (1992), Traylor (1982), Voous (1983), Wetmore (1939, 1946, 1972), Wright *et al.* (1985), Zimmer (1941b).

126. **Amazonian Scrub-flycatcher**

Sublegatus obscurior

French: Tyranneau ombré **Spanish**: Mosquero Matorralero Amazónico
German: Amazonas-Strauchtyrann
Other common names: Dusky Flycatcher, Todd's Scrub-flycatcher

Taxonomy. *Sublegatus glaber obscurior* Todd, 1920, Cayenne, French Guiana.
Unpublished molecular data suggest that genus is closely related to *Suiriri islerorum*. All members of genus formerly treated as conspecific, but vocal and plumage data support existence of three species, possibly more; additional study needed in order to resolve species limits. Monotypic.
Distribution. Amazonia from E Colombia, S Venezuela and S Guianas S to E Ecuador, E Peru, NW Bolivia and NC Brazil (S, in E, to R Tocantins, in Pará).



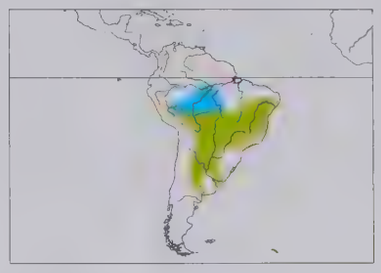
Descriptive notes. 14 cm; 14·5-17 g. Has faint, thin pale supercilium; dark greyish-brown above, wings dusky grey with indistinct greyish to whitish wingbars; tail dusky; chin, throat and upper breast dark, dusky grey, abdomen dingy yellow; iris dark brown; bill short, stubby, black; legs grey. Distinguished from congeners by darker plumage overall, darker grey of throat grading into duller yellow underparts, lacking sharp demarcation between breast and belly. Sexes alike. Juvenile not described. Voice. Dawn song a loud, repeated phrase of 2-3 syllables, "ch-we-deé ch-we-deé chu-weeé", third syllable upslurred and not always given during each bout; call note "jeeer", more burry and drawn out than that of *S. modestus*, lacking squeaky quality of *S. arenarum* call.
Habitat. Scrubby clearings and forest and river edge, from sea-level to at least 450 m; locally to 900 m at base of E Andes. Typically in more mesic habitats than those preferred by congeners.
Food and Feeding. Arthropods; probably also small berries. Forages inconspicuously in shrubs and small trees, perching upright with tail vertically downwards; makes long pauses and peering head movements; food items obtained by outward hover-gleans to vegetation and short aerial sallies.
Breeding. Enlarged testes and song during Jul, and nest-building in late Jul, in Ecuador; enlarged testes during Mar in Guyana. Nest is open cup in fork of horizontal branch, c. 8 m above ground. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Local and apparently rare to uncommon, although easily overlooked because of inconspicuous behaviour. Occurs in La Selva Lodge, in Ecuador, Tambopata-Candamo Reserved Zone, in Peru, and Madidi National Park, in Bolivia. Has probbly increased, and will continue to do so, with degradation of primary forest; elevational range may increase with degradation at base of E Andes.
Bibliography. Allen (1995), Cory & Hellmayr (1927), Greeney *et al.* (2004), Hennessey, Herzog & Sagot (2003), Hilty (2003), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1982), Zimmer (1941b).

127. **Southern Scrub-flycatcher**

Sublegatus modestus

French: Tyranneau modeste **Spanish**: Mosquero Matorralero Sureño
German: Südlicher Strauchtyrann

Taxonomy. *M(uscipeta) modesta* Wied, 1831, Camamú and Bahia, Brazil.
Unpublished molecular data suggest that genus is closely related to *Suiriri islerorum*. All members of genus formerly treated as conspecific, but vocal and plumage data support existence of three species, possibly more; additional study needed in order to resolve species limits. Birds in highlands of Bolivia, which are longer-winged but resident, may represent an unnamed cryptic species. Two subspecies recognized.
Subspecies and Distribution.
S. m. modestus (Wied, 1831) - C Peru (Urubamba Valley) and N Bolivia E through S Brazil (E to Maranhão, Pernambuco and Paraná).
S. m. brevirostris (d'Orbigny & Lafresnaye, 1837) - breeds S Bolivia and Paraguay S to N Argentina (S to Buenos Aires and Mendoza) and E to Uruguay; regular non-breeding visitor N to E Peru and C Amazonia.
Descriptive notes. 13 cm; 9·5-13 g. Nominate race is greyish-brown above, with almost imperceptible pale supercilium; wings dusky grey, with paler greyish wingbars; tail dusky; chin whitish, throat and chest pale grey, grading into medium to pale yellow abdomen; iris dark brown; bill very short and stubby, black; legs grey. Separated from congeners by smaller size, especially smaller bill. Sexes alike. Juvenile undescribed. Race *brevirostris* has longer wings and tail, pure white wingbars. Voice. Dawn song of lowland birds a loud, repeated 2-syllable "pseee-ú"; call note a soft "cheer".
Habitat. Breeds in arid scrub and open deciduous woodland, mainly in very dry habitats; during migration and on wintering grounds in N Bolivia, recorded to 2750 m.
Food and Feeding. Arthropods recorded. Forages inconspicuously in shrubs and small trees, perching upright with tail vertically downwards; food items obtained by outward hover-gleans to vegetation and short aerial sallies.



Breeding. Nest-building in Sept and many nests with eggs or young Oct-Dec in Argentina; singing and birds with enlarged testes in late Oct in N Paraguay. Nest a small cup, 4 cm × 1 cm, placed 1-2 m up in fork of small bush or tree. Clutch 2 eggs; incubation period 17 days and nestling period 14-16 days (Argentina).
Movements. Migratory in S. Populations breeding in Argentina (*brevirostris*) reach N at least to W Amazonia, and recorded as far N as Mitú, in SE Colombia; perhaps regular migrant to N of Amazon, but typically overlooked because of highly inconspicuous behaviour and plumage.
Status and Conservation. Not globally threatened. Uncommon. Occurs in several protected areas, e.g. Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, Noel Kempff Mercado National Park, in Bolivia, and Serra da Canastra National Park, in Brazil. Populations in second growth and open, dry woodland may presumably benefit from degradation of primary forest.
Bibliography. Allen (1995), Bates & Parker (1998), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Di Giacomo (2004), Dubs (1992), Hayes (1995), Hilty & Brown (1986), Joseph (1996), Meyer de Schauensee (1982), Mezquida (2002), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), Olivares (1964), de la Peña (1987, 1988, 1995), Ridgely & Tudor (1994), Short (1975), da Silva *et al.* (1997), Stotz *et al.* (1996), Traylor (1982), Zimmer (1941b).

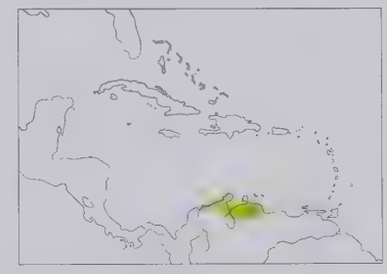
Genus *INEZIA* Cherrie, 1909

128. **Slender-billed Tyrannulet**

Inezia tenuirostris

French: Tyranneau à bec fin **German**: Olivbraun-Tachurityrann **Spanish**: Piojito Picofino

Taxonomy. *Camptostoma pusillum tenuirostris* Cory, 1913, River Aurare, Venezuela.
Genus as currently constituted is probably polyphyletic. Present species perhaps merits monotypic genus, or its relationships lie elsewhere in family. Monotypic.
Distribution. Desert regions of extreme NE Colombia (including Santa Marta region) and NW Venezuela.



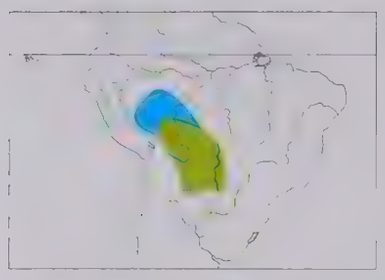
Descriptive notes. 9 cm; 5-6 g. Tiny, nondescript desert tyrannulet with needle-like bill. Has narrow eyering and narrow supercilium white; crown and upperparts greyish-olive, wings dusky, two thin wingbars and outer edges of inner remiges dull white; tail dusky olive, feathers with pale outer edges and tips; face and throat whitish, breast and belly dingy greyish white, tinged pale yellow on belly and undertail-coverts; iris dark brown; bill short and thin, black; legs grey. Sexes alike. Juvenile undescribed. Voice. Long, dry trill trailing off and fading at end; also whistled "teer-téér-teer-terr-teer".
Habitat. Dry thorn-scrub, arid woodlands, tall *Acacia*-dominated arroyos, cactus desert with tall shrubs, cattle pastures with tall thorny shrubs, shrubby gardens surrounded by desert; also mangrove edges. Sea-level to 300 m, locally to 800 m.
Food and Feeding. Insects; also berries and small fruits. Usually alone or in pairs, rarely joins mixed-species flocks. Forages actively at all levels in dense shrubs, often cocks tail slightly; perch-gleans and hover-gleans in foliage and twigs, behaviour like that of a vireo (Vireonidae).
Breeding. Not documented.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Caribbean Colombia and Venezuela EBA. Fairly common to common. Common in lowland scrub W of Santa Marta Mts and on Guajira Peninsula, in Colombia; especially common throughout Falcón and on Paraguaná Peninsula, in Venezuela. Although large expanses of suitable habitat remain within the species' limited range, none is protected; moreover, substantial areas have been destroyed, principally around L Maracaibo (Venezuela), as a result of overgrazing, firewood-gathering, tourist development and environmental pollution.
Bibliography. Cory & Hellmayr (1927), Cracraft (1985), Fitzpatrick (1980c, 1985b), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Ridgway (1907), Stotz *et al.* (1996), Strewe & Navarro (2003), Zimmer, J.T. (1955b), Zimmer, K.J. & Whittaker (2000).

129. **Plain Tyrannulet**

Inezia inornata

French: Tyranneau terne **German**: Grauscheitel-Tachurityrann **Spanish**: Piojito Picudo

Taxonomy. *Serpophaga inornata* Salvadori, 1897, San Francisco, Tarija, Bolivia.
Genus as currently constituted is probably polyphyletic. Present species was for long placed in genus *Serpophaga*, and has been proposed that the two genera be merged; syringeal evidence, however, suggests that *Inezia* is closer to *Sublegatus*. Monotypic.
Distribution. SE Peru (Madre de Dios), N & E Bolivia, adjacent SW Brazil (N to Rondônia), N Paraguay, and NW Argentina (Salta, Jujuy). Breeding range uncertain, probably only non-breeding visitor in Peru, N Bolivia and Brazil; specimen dates indicate possible breeding as far N as Beni (Bolivia).
Descriptive notes. 10 cm; 5·5-6 g. Has thin whitish supercilium, and greyish to olive-grey crown and upperparts; wings dusky, with two thin wingbars and outer edges of inner remiges dull white; tail dusky; face, chin and throat whitish, underparts dingy grey, tinged pale yellowish on lower



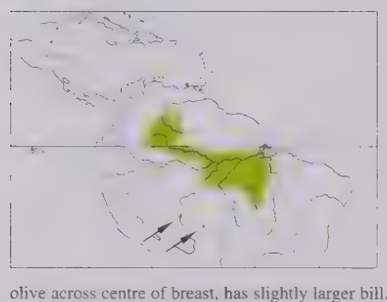
abdomen; iris dark brown; bill thin, black, with base of lower mandible sometimes pale; legs grey. Sexes alike. Juvenile not described.
Voice. A somewhat musical series of thin whistles with emphatic introductory note, "psee-tee-ee-ee-ee".
Habitat. Inhabits deciduous and semi-deciduous woodland, Chaco, and forest borders; in non-breeding season, mainly shrubby river margins and *Tessaria*-dominated early-successional growth bordering beaches. Sea-level to 700 m.
Food and Feeding. Insects; probably some fruit. Usually alone or in pairs; occasionally joins mixed-species flocks. Forages actively in dense foliage, often cocks tail slightly; mainly perch-gleans, also hover-gleans in foliage and twigs.
Breeding. Birds with enlarged gonads in Nov in Bolivia. No other information.
Movements. Apparently present in Peru, Brazil and N Bolivia (N of 17° S) only in austral winter, suggesting migration from breeding grounds in Argentina, Paraguay and E Bolivia.
Status and Conservation. Not globally threatened. Status not well known; apparently uncommon. Has been recorded in Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, Madidi and Noel Kempff Mercado National Parks and Beni Biosphere Reserve, in Bolivia, and San Luis National Park, in Paraguay.
Bibliography. Allen (1995), Bates & Parker (1998), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Dubs (1992), Fitzpatrick (1980c, 1985b), Hayes (1995), Joseph (1996), Lanyon (1988b), Meyer de Schauensee (1982), Miserendino (1998), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Parkes (1973), de la Peña (1988), Perry *et al.* (1997), Ridgely & Tudor (1994), Ridgway (1907), Short (1975), Sick (1993, 1997), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Wetmore (1926), Willis & Oniki (1990), Zimmer (1955), Zyskowski *et al.* (2003).

130. Amazonian Tyrannulet

Inezia subflava

French: Tyranneau givré **German**: Braunscheitel-Tachurityrann **Spanish**: Piojito Pantanero

Taxonomy. *Serpophaga subflava* P. L. Sclater and Salvin 1873, Belém, Pará, Brazil.
Genus as currently constituted is probably polyphyletic. Present species and *I. caudata* closely related and formerly considered conspecific; recently split on basis of differences in plumage, iris colour and, especially, vocal behaviour. Two subspecies recognized.
Subspecies and Distribution.
I. s. obscura J. T. Zimmer, 1939 - S Venezuela (Amazonas), adjacent SE Colombia (E Guainía, E Vaupés) and NW Brazil (vicinity of upper R Negro).
I. s. subflava (P. L. Sclater & Salvin, 1873) - EC Brazil (lower R Negro and lower R Madeira E to Pará) and extreme N Bolivia (Beni, NE Santa Cruz); probably also in intervening region of Amazon Basin.



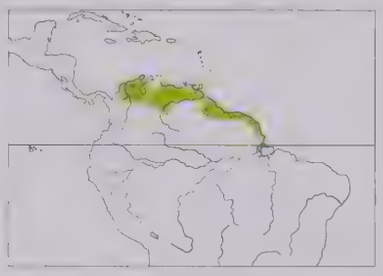
Descriptive notes. 12 cm; 7-8 g. Nominate race has broad white eyering and supraloral area extending forwards to above nostrils (prominent "spectacles"); crown and upperparts olive-brown, wings dusky, two thin wingbars and outer edges of inner remiges dull white to pale yellowish-white; tail quite long, dusky olive, conspicuously whitish to pale ochraceous on outer edges and tips; face and chin whitish, throat and underparts yellow, tinged or flammulated olive on side of breast; iris brown; bill long and thin, black; legs grey. Sexes alike, female slightly smaller than male. Juvenile undescribed. Race *obscura* is strongly washed olive across centre of breast, has slightly larger bill.
Voice. Main song a dry rattle of closely spaced notes (26 notes in 2 seconds), on one pitch; also distinctive duet, with explosive series of "pit-chew" notes (2 per second) probably by male, and slightly lower-pitched "kut-up" or "kutterup" notes at slightly faster intervals probably by female, duets sometimes initiated by rapid series of "kip" notes by presumed male; also an abrupt, loud series of "chew" notes, and abrupt "pik".
Habitat. Shrubby vegetation along streamsides and riverbanks, dense swamp-forest, *várzea*; usually near water. Sea-level to 200 m.
Food and Feeding. Insects recorded. Forages actively, in pairs, usually 1-3 m above ground in dense shrubs, tail almost always held cocked above horizontal; perch-gleans and hover-gleans items from foliage.
Breeding. Nest (Brazil) a simple cup. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Common at Puerto Inírida (NE Guainía), in Colombia. Occurs in Jaú and Tapajós National Parks and Anavilhanas Zoological Station, in Brazil, and Noel Kempff Mercado National Park, in Bolivia.
Bibliography. Anon. (2001g), Bates & Parker (1998), Cory & Hellmayr (1927), Friedmann (1948), Green (2001a), Hennessey, Herzog & Sagot (2003), Hilty (2003), Hilty & Brown (1986), Lanyon (1988b), Meyer de Schauensee (1982), Oren & Parker (1997), Ridgely & Tudor (1994), Ridgway (1907), Sick (1993, 1997), Snethlage (1935), Stotz *et al.* (1996), Traylor (1977), Zimmer & Whittaker (2000).

131. Pale-tipped Tyrannulet

Inezia caudata

French: Tyranneau frangé **German**: Blassspitzen-Tachurityrann **Spanish**: Piojito Coludo

Taxonomy. *Capsiempis caudata* Salvin, 1897, Ourumee, Guyana.
Genus as currently constituted is probably polyphyletic. Present species and *I. subflava* closely related and formerly considered conspecific; recently split on basis of differences in plumage, iris colour and, especially, vocal behaviour. Two subspecies recognized.
Subspecies and Distribution.
I. c. intermedia Cory, 1913 - NE Colombia (lower Magdalena Valley, Santa Marta region) and N Venezuela (Maracaibo Basin, and Portuguesa E to Sucre).
I. c. caudata (Salvin, 1897) - C & E Venezuela (from Apure, lower R Caura, R Orinoco and Delta Amacuro) E through the Guianas, and N Brazil (R Branco region and Amapá).



Descriptive notes. 12 cm; 7-8 g. Nominate race has broad white eyering and supraloral line extending forwards to above nostrils (prominent "spectacles"); crown and upperparts olive-brown to greyish-brown, crown noticeably more grey; wings dusky, two thin wingbars and outer edges of inner remiges dull white to pale yellowish-white; tail quite long, dusky olive, conspicuously whitish to pale ochraceous on outer edges and tips; face and chin whitish, throat and underparts yellow, distinctly tinged buffy to ochraceous on throat and breast; iris whitish to yellowish-white; bill long and thin, black; legs grey. Sexes alike, female slightly smaller than male. Juvenile has brown eyes. Race *intermedia* has paler throat, less ochraceous on breast, slightly smaller bill.
Voice. Very vocal; main song a short series of notes, the first two louder and higher than others, "cheep chee deleet-eet", sometimes preceded by several brief "kip" notes, also given repeatedly at 1-second intervals as dawn song; also a long descending series of evenly spaced whistled notes, "chee, cheep cheep, cheep, chew chew chew", by both sexes in syncopated duet; and abrupt "pit", sometimes in short series.
Habitat. Deciduous and semi-deciduous woodland, gallery forest, seasonally flooded forest, shrubby second growth, and mangroves; sea-level to 400 m.
Food and Feeding. Ants (Hymenoptera) and spiders (Araneae) recorded as eaten. Usually alone or in pairs; occasionally joins mixed-species flocks. Forages actively at all levels in dense foliage, often cocks tail slightly; perch-gleans and hover-gleans in foliage and twigs, behaviour like that of a vireo (Vireonidae).
Breeding. Jan-Jul in Venezuela and Surinam. Nest a simple, thin open cup, placed at 2-5 m or higher on fork of tree branch. No information on clutch size and incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Common to fairly common. Especially common on Venezuelan *llanos*.
Bibliography. Anon. (2001g), Chapman (1917c), Cory & Hellmayr (1927), Fitzpatrick (1980c, 1985b), Green (2001a), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Lanyon (1988b), Ridgely & Tudor (1994), Ridgway (1907), Snyder (1966), Strewe & Navarro (2003), Tostain *et al.* (1992), Wetmore (1939), Zimmer & Whittaker (2000).

PLATE 24 ➤



PLATE 24

inches 2
cm 5

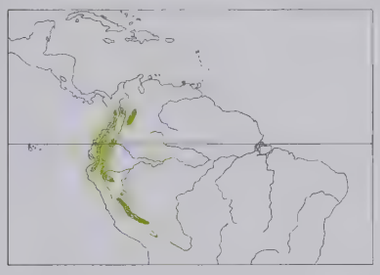
Genus *MYIOTRICCUS* Ridgway, 1905

132. **Ornate Flycatcher**

Myiotriccus ornatus

French: Tyranneau orné **German**: Schmucktyrann **Spanish**: Mosquerito Adornado

Taxonomy. *Tyrannula ornata* Lafresnaye, 1853, Bogotá, Colombia.
Distinctive monotypic genus of uncertain affinities, hypothesized as closest to *Myiophobus* on basis of cranial characters, bright crown patch and cup-shaped nest. Four subspecies recognized.
Subspecies and Distribution.
M. o. ornatus (Lafresnaye, 1853) - C Andes and W slope at N end of E range, in Colombia.
M. o. stellatus (Cabanis, 1873) - W Colombia and W Ecuador.
M. o. phoenicurus (P. L. Sclater, 1855) - E Andes of SE Colombia, E Ecuador and Peru (N of R Marañón).
M. o. aureiventris (P. L. Sclater, 1874) - C & SE Peru (Huánuco S to Puno).



Descriptive notes. 11·4 cm; 11-14 g. Strikingly patterned flycatcher. Nominate race has black on face and crown, conspicuous white crescent-shaped preocular patch, semi-concealed bright yellow coronal patch; rest of head, and throat, grey, upperparts deep olive, rump bright golden-yellow; wings dusky black; tail bright rufous at base, dusky black on distal half; breast rich olive, belly bright golden-yellow; iris dark brown; bill black; legs black. Sexes alike, female slightly smaller than male. Juvenile undescribed. Races vary mainly in colour of tail: *stellatus* has tail yellowish at base, is also much smaller than nominate, loral crescent more restricted, often interrupted in middle; *phoenicurus* has tail entirely rufous; *aureiventris* has back slightly paler green, lighter grey throat with grey extending farther down, breast paler green. Voice. Very loud, ringing, single "peek" or "wheep", repeated frequently while actively foraging or perched, occasionally in rapid series.
Habitat. Humid montane forest and older second growth, often in old treefall gaps and dark, mossy ravines and stream edges; mainly 600-2300 m, locally down to 300 m near foothills.
Food and Feeding. Stomach contents in SE Peru contained 193 prey items, of which beetles (Coleoptera) 47%, Hymenoptera 34% (ants 26%, bees and wasps 8%), bugs (Hemiptera) 10%, homopterans (planthoppers) 6%, other 3%. Forages singly or, more often, in pairs; joins mixed-species flocks only when they move through its small territory. Perches upright at low to middle levels on open, exposed perches, almost always in deep shade; pauses for long periods, actively moving head about in search of aerial prey. Sallies mainly into air, frequently returns to same or nearby perch. Highly sedentary, found in same foraging zone day after day.
Breeding. Nest in Mar and birds in breeding condition in May in Colombia; in breeding condition in Sept-Dec in SE Peru. Single nest found, cup-shaped, made of rootlets, placed 1·3 m up on steep earth bank and well concealed; contained one nestling. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to common. Occurs in Tambito Nature Reserve, in Colombia; in Ecuador, found in Río Palenque Science Centre and several other protected areas, and common in Cordillera de Mache at Bilsa (Esmeraldas).
Bibliography. Begazo (1995), Birdsley (2002), Butler (1979), Chapman (1917c), Clements & Shany (2001), Cory & Hellmayr (1927), Fitzpatrick (1985b), Hilty (1997), Hilty & Brown (1986), Lanyon (1986a, 1988b), Meyer de Schauensee (1982), Miller (1963), Restrepo & Gómez (1998), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996), Strewe (2000b), Traylor (1958, 1977), Williams & Tobias (1994), Zimmer (1939b).

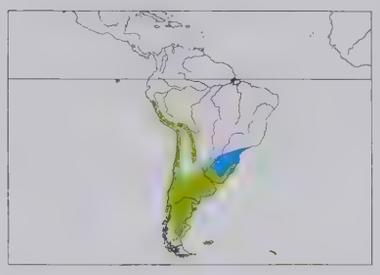
Genus *TACHURIS* Lafresnaye, 1836

133. **Many-coloured Rush-tyrant**

Tachuris rubrigastra

French: Tyranneau omnicolore **German**: Vielfarben-Tachurityrann **Spanish**: Sietecolores
Other common names: Many-coloured Tyrant

Taxonomy. *Sylvia rubrigastra* Vieillot, 1817, Paraguay.
Distinctive monotypic genus hypothesized by some as being closest to *Pseudocolopteryx*. Four subspecies recognized.
Subspecies and Distribution.
T. r. libertatis Hellmayr, 1920 - W Peru (La Libertad S to Lima and N Ica).
T. r. alticola (Berlepsch & Stolzmann, 1896) - C & SE Peru (Junín S to Puno), W Bolivia (La Paz, Oruro) and NW Argentina (Jujuy, Tucumán).
T. r. loaensis R. A. Philippi [Bañados] & Johnson, 1946 - N Chile (Antofagasta at confluence of R Loa and R San Salvador).
T. r. rubrigastra (Vieillot, 1817) - Paraguay, SE Brazil (S São Paulo, Rio Grande do Sul), C & W Chile (Atacama S to Chiloé and Aisén), Argentina (Misiones, and from Santa Fe to Buenos Aires and S to Santa Cruz) and Uruguay.
Descriptive notes. 11-11·5 cm; 6·5-8 g. Vibrantly coloured, the most colourful of all tyrannids. Male nominate race has crown black, prominent golden supercilium, semi-concealed red coronal



patch and slight crest; lores and auriculars glossy blue to black, giving masked appearance; nape ochraceous, edging into bright moss-green back; wings black, prominent white bar formed by white edging of wing-coverts and tertials; tail black, outer rectrices white; upper throat white; breast and belly bright yellow, black bars near bend of wing (nearly meeting at centre), crissum bright red to orange-red, sometimes a faded rose-pink; iris pale, bluish; bill black; tarsi notably long, black. Female has same general pattern as male, slightly duller colours, coronal patch smaller. Immature lacks blue on facial mask, green upperparts may be scaled yellow, breast and belly paler yellow, breastbars absent. Race *libertatis* has whiter throat and belly and greener, less prominent supercilium than nominate; *alticola* has darker, more blackish-green back, paler yellow supercilium, is slightly larger; *loaensis* is smaller, has more extensive white on throat, stronger yellowish-ochre on neck and breast, pale greyish-white belly, supercilium tinged green, tail edged brighter white. Voice. Bizarre, rapid series of insect-like "tic" notes, and musical "piwup bzzzzt" or "piwup piwuprrrrp" with gurgled quality and buzzing element.
Habitat. Extensive reedbeds, marshes, and grassy lake edges, very rarely leaving patches of reeds for adjacent growth; sea-level to 4200 m.
Food and Feeding. Insects. Forages alone or in family groups in dense rushes, usually well concealed. Mainly perch-gleans items from reed edges or floating vegetation, often clinging or hanging upside-down from reed stems, sometimes sallying out for aerial prey or flight-gleaning insects from water surface; sometimes runs or hops on ground, mud or floating vegetation in search of prey.
Breeding. Eggs in Oct, nestlings in Sept and fledglings in Feb in Peru; in breeding condition in Sept and Oct and fledgling in Feb in SE Brazil. Very distinctive, deep, tight, cone-shaped cup-nest attached by its side to single reed, usually over water; uses wet pieces of reed leaf which, after drying, achieve consistency of cardboard. Clutch 3 eggs, rarely 4; no information on incubation and fledging periods.
Movements. Migratory patterns poorly understood; populations in S parts of range move N during austral winter; one individual recorded 170 km offshore from Rio Grande do Sul, in Brazil, in Mar 1960.
Status and Conservation. Not globally threatened. Locally common; often found in scattered, loose colonies, with intervening suitable habitat apparently unoccupied. In NW of range, abundant at L Junín (Peru), and common at L Titicaca and L Poopó (Bolivia). Occurs in many protected areas, e.g. Costanera Sur Ecological Reserve, in Argentina.
Bibliography. Babarskas *et al.* (2003), Belton (1985), Canevari *et al.* (1991), Chebez (1994), Clements & Shany (2001), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Darrieu (1987), Fitzpatrick (1985b), Fjeldså (1983), Fjeldså & Krabbe (1990), Flores & Capriles (1998), Harris (1998), Hayes (1995), Jaramillo (2003), Johnson (1967), Klimaitis & Moschione (1987), Lanyon (1988b), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1987, 1988), Ridgely & Tudor (1994), do Rosário (1996), Schönwetter & Meise (1968), Sick (1993, 1997), Smith (1971), Stotz *et al.* (1996), Traylor (1977), Traylor & Fitzpatrick (1982), Wetmore (1926), Zimmer (1940b).

Tribe PLATYRINCHINI

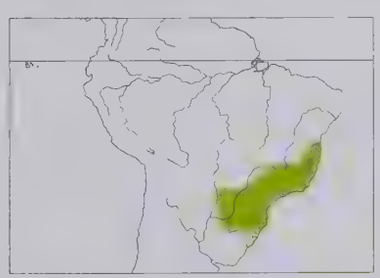
Genus *MYIORNIS* W. Bertoni, 1901

134. **Eared Pygmy-tyrant**

Myiornis auricularis

French: Microtyran oreillard **German**: Ohrfleck-Zwergtyrann **Spanish**: Mosqueta Enana

Taxonomy. *Platyrhynchos auricularis* Vieillot, 1818, Rio de Janeiro, Brazil.
Forms a superspecies with *M. albiventris*, and sometimes considered conspecific. Two subspecies recognized.
Subspecies and Distribution.
M. a. cinereicollis (Wied, 1831) - E Brazil (SE Bahia, Minas Gerais, Espírito Santo).
M. a. auricularis (Vieillot, 1818) - SE Paraguay, NE Argentina (Misiones) and SE Brazil (Rio de Janeiro S to Rio Grande do Sul).



Descriptive notes. 7 cm; 5 g. Very small, round-bodied, large-headed tyrannid. Has buffish-cinnamon area around eye, whitish auriculars, black patch below eye, black crescent-shaped patch at rear edge of auriculars ("eared" appearance); bright olive above, crown tinged brown, nape and neck grey; wings dusky, bright olive-yellow edgings and two indistinct wingbars; tail dusky; throat and upper breast white, finely streaked black, rest of underparts bright yellow, streaked olive; iris orange; bill blackish; feet flesh-coloured. Sexes alike. Juvenile undescribed. Race *cinereicollis* is highly variable, has auriculars usually paler than nominate, buffy whitish. Voice. Series of "pic" notes followed by musical trill, "pic-pic-pic-pree-ee-ee-ee-ee"; wings produce whirring or buzzing sound in flight.

On following pages: 135. White-bellied Pygmy-tyrant (*Myiornis albiventris*); 136. Black-capped Pygmy-tyrant (*Myiornis atricapillus*); 137. Short-tailed Pygmy-tyrant (*Myiornis ecaudatus*); 138. Northern Bentbill (*Oncostoma cinereigulare*); 139. Southern Bentbill (*Oncostoma olivaceum*); 140. Scale-crested Pygmy-tyrant (*Lophotriccus pileatus*); 141. Long-crested Pygmy-tyrant (*Lophotriccus eulophotes*); 142. Double-banded Pygmy-tyrant (*Lophotriccus vitiosus*); 143. Helmeted Pygmy-tyrant (*Lophotriccus galeatus*); 144. Pale-eyed Pygmy-tyrant (*Atalotriccus pilaris*).

Habitat. Humid forest and forest edge, usually in dense, shrubby growth along edges, less frequent within forest itself; sometimes moves beyond forest edge to low satellite trees in meadows. To 1250 m.
Food and Feeding. Insects. Forages mostly in lower and middle growth usually at 2-3 m; perches in the open, moving rapidly and changing perches frequently. Makes buzzing flights to strike leaves for prey.
Breeding. Nests found in Dec. Nest purse-shaped, with side entrance, made of twigs, stems and dry leaves, sometimes with hanging "tail", suspended from horizontal branch c. 1-3 m up in bush. Clutch 2 or 3 eggs. Nest (amazingly) parasitized by Pavonine Cuckoo (*Dromococcyx pavoninus*). No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common. Although much suitable habitat for this species has been destroyed or heavily degraded, it still occurs in many national parks and other protected areas throughout its range.
Bibliography. Brooks *et al.* (1993), Canevari *et al.* (1991), Cory & Hellmayr (1927), Cracraft (1985), Darrieu (1987), Hayes (1995), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Navas & Bó (1993a), de la Peña (1988), Ridgely & Tudor (1994), do Rosário (1996), Saibene *et al.* (1996), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977).

135. **White-bellied Pygmy-tyrant**

Myiornis albiventris

French: Microtyran à ventre blanc **Spanish**: Mosqueta Ventriblanca
German: Weißbauch-Zwergtyrann
Other common names: White-breasted Pygmy-tyrant

Taxonomy. *Orchilus albiventris* Berlepsch and Stolzmann, 1894, La Merced, 2600 feet [c. 790 m], Junín, central Peru.
Forms a superspecies with *M. auricularis*, and sometimes considered conspecific. Monotypic.
Distribution. Locally at base of E slope of Andes in C & E Peru (Junín, Huánuco, Pasco, Ayacucho, E Puno) and N Bolivia (La Paz, Cochabamba, W Santa Cruz).



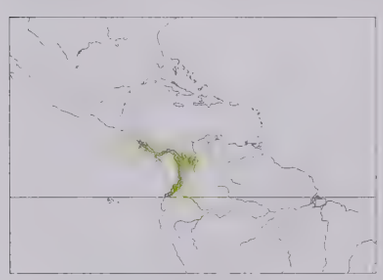
Descriptive notes. 7 cm; 5-6 g. Very small, round-bodied tyrannid with large-headed appearance. Has buff-whitish area around eye, greyish crescent-shaped auricular patch; bright olive above, crown tinged brown; wings dusky, bright olive-yellow edgings and two indistinct wingbars; tail dusky; throat and upper breast whitish, faintly flammulated with grey, rest of underparts white, tinge of yellowish-olive on side and crissum; iris reddish; bill blackish; legs flesh-coloured. Differs from *M. auricularis* in e.g. less conspicuous auricular crescent, paler underparts, slightly shorter tail. Sexes alike. Juvenile undescribed. Voice. Flat, fast sequence of notes, "dr-rr-rr-rr-rr-t", delivered several times in series.
Habitat. Humid lower montane and foothill forest and edges, at 400-1200 m.
Food and Feeding. Insects. Forages in lower and middle storeys, favouring openings; often perches in the open a few centimetres from leaves, making fast, buzzy sallies to strike at prey.
Breeding. Not documented.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon. Poorly known species. In Bolivia, occurs in Pilón Lajas Biosphere Reserve and Madidi National Park; frequent along lower part of the Villa Tunari road, in Cochabamba.
Bibliography. Clements & Shany (2001), Collar *et al.* (1994), Cory & Hellmayr (1927), Hennessey, Herzog, Kessler & Robinson (2003), Hennessey, Herzog & Sagot (2003), Perry *et al.* (1997), Remsen & Traylor (1989), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Stotz *et al.* (1996), Traylor (1977), Zimmer (1940a).

136. **Black-capped Pygmy-tyrant**

Myiornis atricapillus

French: Microtyran à calotte noire **Spanish**: Mosqueta Capirotada
German: Schwarzkappen-Zwergtyrann

Taxonomy. *Orchilus atricapillus* Lawrence, 1875, Talamanca, Costa Rica.
Formerly placed in a separate genus, *Perissotriccus*, along with *M. ecaudatus*. The two form a superspecies and were previously treated by many authors as conspecific. Monotypic.
Distribution. Costa Rica S to W Colombia and NW Ecuador.



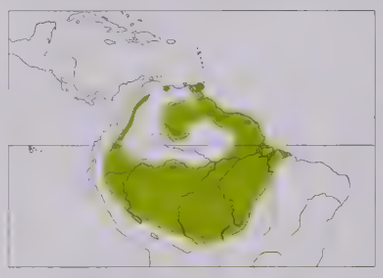
Descriptive notes. 6·5 cm; 5 g. Tiny, one of the smallest passerines, with almost tail-less appearance. Male has black crown, prominent white supraloral spot and white "spectacles", slate-grey nape and side of face; upperparts bright olive; wings dusky with olive-green edgings, brighter yellow on secondaries; tail extremely short, mostly black; throat and upper breast white, side of neck and breast pale grey, underparts washed pale yellow; iris dark reddish-brown; bill black; legs pink to orangish. Female has only forehead black, rest of cap more sooty. Juvenile has cap dark sooty brown, upperparts brownish, edgings of wing-coverts and underparts tinged buff. Voice. High-pitched and ventriloquial, insect-like or frog-like; typically, a soft trilled, purr-like call, also given in series, becoming long series of rapid "tseeyp" or "creek" notes.
Habitat. Lower and middle growth of humid forest, forest gaps and edges, shrubby growth in clearings, also adjacent second growth and plantations; to 900 m.
Food and Feeding. Stomach contents in Costa Rica included 205 items, of which homopteran bugs 26%, beetles (Coleoptera) 25%, arachnids 15%, hymenopterans 13%, lepidopteran larvae 10%, orthopterans 6%, other 5%. Forages usually singly or in pairs, not following mixed-species flocks, mostly high in canopy, venturing lower in areas near gaps and edges. Makes quick, buzzy flights, gleaning prey from undersides of leaves, occasionally hovering. Inconspicuous owing to infrequent movements.
Breeding. Eggs in late Mar in Panama and mid-Apr in Costa Rica. Bag-like domed nest c. 15 cm long, 9 cm in diameter, with side entrance in middle and dangling streamer, constructed from green moss, egg-chamber lined with fine yellow fibres and plant down, suspended from slender twig of fallen branch or from thorny tree c. 1-4 m above ground. Clutch 2 eggs; nest apparently tended only by female; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common, but often overlooked. Occurs in Tinigua National Park, in Colombia, and Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru. Common along lower Buenaventura road in Valle (Colombia).
Bibliography. Anon. (1998a), Chapman (1917c), Cory & Hellmayr (1927), Eisenmann (1955), Haffer (1974, 1975), Hilty & Brown (1986), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Salaman (1994), Sherry (1984), Slud (1960, 1964), Stiles (1985), Stiles & Skutch (1989), Stiles *et al.* (1999), Stotz *et al.* (1996), Strewe (2000b), Traylor (1977), Wetmore (1972), Willis (1980), Willis & Eisenmann (1979).

137. **Short-tailed Pygmy-tyrant**

Myiornis ecaudatus

French: Microtyran à queue courte **Spanish**: Mosqueta Colicorta
German: Stummelschwanz-Zwergtyrann

Taxonomy. *T[odirostrum] ecaudatum* d'Orbigny and Lafresnaye, 1837, Yuracarés, Bolivia.
Formerly placed in a separate genus, *Perissotriccus*, along with *M. atricapillus*. The two form a superspecies and were previously treated by many authors as conspecific. Two subspecies recognized.
Subspecies and Distribution.
M. e. miserabilis (Chubb, 1919) - Venezuela (Carabobo, Mérida, Táchira, Barinas, N Amazonas, Bolívar), Trinidad, the Guianas, E Colombia (Meta) and N Brazil (Amapá).
M. e. ecaudatus (d'Orbigny & Lafresnaye, 1837) - Amazon Basin of E Ecuador, E Peru, Brazil (from Amazonas E to Pará) and N Bolivia (S to Cochabamba and Santa Cruz).



Descriptive notes. 6·5 cm; 4·2 g. Tiny, the smallest passerine, looking nearly tail-less. Nominate race has dark grey head with very prominent white supraloral spot, white eyering and blackish lores, giving "spectacled" appearance; upperparts bright olive-green; wings dusky with bright yellow edgings and indistinct wingbars; tail extremely short, mostly black; throat and underparts white, crissum tinged pale yellow; iris dark; bill long for bird of this size, black; legs flesh-coloured. Sexes alike. Juvenile is similar to adult. Race *miserabilis* has darker, duller green back, darker grey on top of head and hindneck, greyer side of chest, darker legs. Voice. High-pitched and faint, very insect-like or frog-like, easily mistaken as a non-bird sound; most often a soft trilled, purr-like call, sometimes leading into long series of short, squeaky "creek" notes beginning slowly and accelerating, "cre'e'e'e'e', k'e'e'e'e"; buzzing sound produced by wings in flight.
Habitat. Humid forest, forest gaps and edges, also adjacent clearings and second growth; lowlands and foothills to 950 m.
Food and Feeding. Insects. Usually found singly or in pairs, rarely following mixed-species flocks. Forages mostly high in canopy, venturing lower in areas near forest gaps and edges; often associated with older treefall gaps with high vine thickets. Makes quick, buzzy flights to strike tops or undersides of leaves for insects; occasionally hovers. Inconspicuous owing to infrequent movements.
Breeding. Eggs from mid-Jun to mid-Sept in Amazonian Brazil; nest with nearly fledged young in late Aug and single breeding record in Jan in Venezuela; one Jan breeding record in Surinam; birds in breeding condition in Feb-May (and fledgling seen in Mar) in Colombia, and Aug-Oct in SE Peru. Bag-like domed nest with side entrance, small awning projecting above entrance hole, and dangling loose streamer, measurements of one 25 cm long (including tail 11 cm), 9-11 cm in diameter, entrance 2·5 × 4 cm; constructed from green moss, fine grass blades, macerated dry leaves, fragments of disintegrating weeds, and rootlets, sometimes mixed with varying amount of hair, brood-chamber profusely lined with hair, or only floor lined with fine plant fibres, bits of grass and buff and white pappi or seed plumes (of unidentified composite); suspended from branch 1-6 m above ground. Clutch 2 eggs; incubation probably by female alone (on basis of presence of incubation patch); both parents feed nestlings and remove faecal sacs; no information on duration of incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common; frequently overlooked. Occurs in many national parks and other protected areas throughout its range.
Bibliography. Bates & Parker (1998), Blake (1962), Chapman (1921), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), ffrench (1991), Fitzpatrick (1980c), Friedmann (1948), Haffer (1974), Haverschmidt (1968), Haverschmidt & Mees (1994), Hennessey, Herzog, Kessler & Robinson (2003), Hilty (2003), Hilty & Brown (1986), Ihering (1901), McNeil & Martínez (1968), Meyer de Schauensee (1982), Novaes (1978a), Oren & Parker (1997), Perry *et al.* (1997), Pinto (1953), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schönwetter & Meise (1968), Schubart *et al.* (1965), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Temple (2002), Tostain *et al.* (1992), Traylor (1977), Wetmore (1972), Willard *et al.* (1991), Zimmer (1940a).

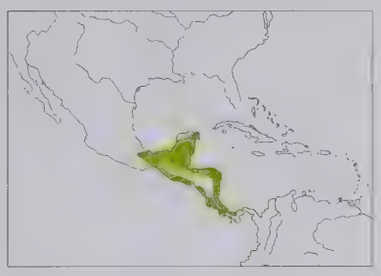
Genus *ONCOSTOMA* P. L. Sclater, 1862

138. **Northern Bentbill**

Oncostoma cinereigulare

French: Bec-en-arc cendré **Spanish**: Mosquerito Piquicurvo Norteño
German: Graukehl-Krummschnabeltyrann
Other common names: Bent-billed Flycatcher, Grey-throated Bentbill

Taxonomy. *Todirostrum cinereigulare* P. L. Sclater, 1857, Córdoba, Veracruz, Mexico.
Has been suggested by some authors that genus be joined with closely affiliated *Hemitriccus* or *Lophotriccus*; bill morphology and peculiar voice, however, viewed by others as sufficiently distinct to support retention of separate genus. Forms a superspecies with *O. olivaceum*, and sometimes considered conspecific. Distribution somewhat uncertain; one specimen from NW Antioquia, in Colombia, identified as belonging to present species on basis of yellow underparts, possibly representing disjunct population separated from nearest one (W Panama) by 400-600 km; slight variation in belly colour of present species, however, leads to questions about true identity of this specimen. Monotypic.
Distribution. S Mexico S to W Panama (possibly in Bocas del Toro and N Veraguas).



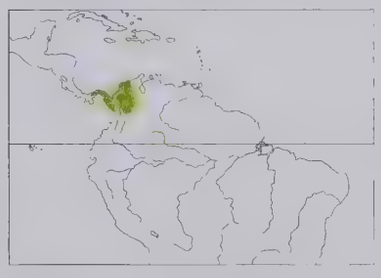
Descriptive notes. 9·5-10·5 cm; 4·5-7 g. Distinctive bill with significant downward curve. Has grey crown contrasting strongly with olive upperparts; wings dusky with lemon-yellow edgings; face, throat and breast pale grey, streaked olive, lower underparts and crissum washed pale lemon-yellow, flanks tinged olive; iris pale yellow; bill grey, flesh-coloured base; legs flesh-coloured. Differs from *O. olivaceum* most clearly in having ground colour of throat and breast greyish-white, as opposed to yellowish-white. Sexes alike. Juvenile has olive crown, narrow buffy wingbars and buffy edges of remiges, dusky bill. Voice. Guttural insect-like or toad-like trill, "grrrr" or "chiurrrrrrrr", sometimes with introductory note, "t-trrrrrr"; also a descending, melodious trill.
Habitat. Thickets and dense undergrowth of humid lowland forest, forest edge, tropical deciduous forest, and secondary woodland and scrubby semi-open areas; sea-level to 1200 m, locally to 1450 m.
Food and Feeding. Arthropods; occasionally eats small berries. Stomach contents in Costa Rica included 98 items, of which beetles (Coleoptera) 33%, arachnids 22%, homopteran bugs 15%, orthopterans 12%, lepidopterans 8%, flies (Diptera) 4%, other 6%. Forages usually alone or in pairs, near ground in dense vegetation; easily overlooked. Sallies upwards to strike undersides of leaves, moves quickly to new perch.
Breeding. Birds in breeding condition in early Apr in El Salvador. Nest, built by female, roundish, vertically elongated, domed, with side entrance, constructed from pale-coloured plant fibres, suspended from leaf or twig from a few centimetres to 4 m above ground. Clutch 2 eggs; incubation and brood-tending undertaken by female alone; no information on duration of incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to common. Occurs in several national parks and other protected areas throughout its reasonably large range. Fairly adaptable; tolerates somewhat disturbed habitat.
Bibliography. Anon. (1998a), Binford (1989), Brodkorb (1943), Cory & Hellmayr (1927), Dearborn (1907), Fitzpatrick (1976, 1985b), Harrowes (1936), Howell & Webb (1995a), Kricher & Davis (1992), Land (1970), Lee Jones (2004), Monroe (1968), Payne (1984), Paynter (1955, 1957), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Romero-Zambrano & Rodríguez (1980), Schönwetter & Meise (1968), Sherry (1984), Skutch (1960), Slud (1960, 1964, 1980), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Thurber *et al.* (1987), Traylor (1977), Traylor & Fitzpatrick (1982), Wetmore (1941, 1943, 1944, 1972).

139. **Southern Bentbill**

Oncostoma olivaceum

French: Bec-en-arc de Lawrence **Spanish**: Mosquerito Piquicurvo Sureño
German: Gelbkehl-Krummschnabeltyrann
Other common names: Lawrence's Bent-billed Tyrant

Taxonomy. *Todirostrum olivaceum* Lawrence, 1862, Lion Hill, Canal Zone, Panama.
Has been suggested by some authors that genus be joined with closely affiliated *Hemitriccus* or *Lophotriccus*; bill morphology and peculiar voice, however, viewed by others as sufficiently distinct to support retention of separate genus. Forms a superspecies with *O. cinereigulare*, and sometimes considered conspecific. Monotypic.
Distribution. C & E Panama and NW Colombia.



Descriptive notes. 9 cm; 6-7 g. Distinctive bill with downward-arching culmen. Plumage is entirely olive above, whitish supraloral area; wings dusky, two indistinct greenish-yellow wingbars and lemon-yellow edgings, tail dusky olive; throat and breast yellowish-white, streaked olive, rest of underparts olive-yellow with some olive streaking, belly yellow; iris pale yellow to dusky; bill grey; legs flesh-coloured. Differs from *O. cinereigulare* most clearly in having ground colour of throat and breast yellowish-white, as opposed to greyish-white. Sexes alike. Juvenile undescribed. Voice. Guttural insect-like or toad-like trill, "grrrrrrrr", sometimes with introductory note, "pt-trrrrrrrr".
Habitat. Humid tropical forest and forest edge, dense secondary-forest borders, sometimes lighter woodland, thickets and shrubby clearings; sea-level to 1000 m.
Food and Feeding. Arthropods; occasionally eats small berries. Forages usually alone or in pairs, near ground in dense vegetation; often overlooked. Sallies upwards to strike undersides of leaves, moves quickly to new perch.
Breeding. Single nests in late Apr and early Aug in Panama; birds in breeding condition in Feb-Jun in Colombia. Small, roundish, domed nest with side entrance near top, small awning projecting above entrance, suspended from slender tree branch 1-4 m above ground. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common; often overlooked. Numerous in Tayrona National Park, in Colombia.
Bibliography. Anon. (1998a), Cory & Hellmayr (1927), Delgado (1985), Eisenmann (1955), Harrowes (1936), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Schönwetter & Meise (1968), Skutch (1960), Stotz *et al.* (1996), Strewe & Navarro (2003), Traylor & Fitzpatrick (1982), Wetmore (1972), Willis (1972, 1980), Willis & Eisenmann (1979).

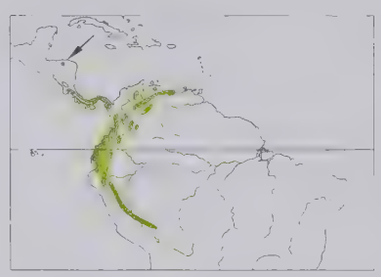
Genus *LOPHOTRICCUS* Berlepsch, 1884

140. **Scale-crested Pygmy-tyrant**

Lophotriccus pileatus

French: Microtyran chevelu **German**: Rot-Schuppenkopftyrann **Spanish**: Cimerillo Andino

Taxonomy. *E[uscarthmus] pileatus* Tschudi, 1844, Valley of Vitoc, Junín, Peru.
Five subspecies recognized.
Subspecies and Distribution.
L. p. luteiventris Taczanowski, 1884 - E Honduras (foothills of the Olancho), Costa Rica and Panama (E to E Darién).
L. p. sanctaeluciae Todd, 1952 - NW Venezuela (from W Zulia E to Miranda and Táchira) and adjoining Colombia.
L. p. squamaecrista (Lafresnaye, 1846) - Andes of Colombia and W Ecuador.
L. p. pileatus (Tschudi, 1844) - Andes of E Ecuador and E Peru (S to Cuzco).
L. p. hypochlorus Berlepsch & Stolzmann, 1906 - SE Peru from Cuzco (Urubamba Valley) S to Puno (R Madre de Dios).



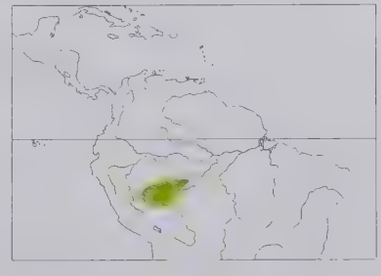
Descriptive notes. 9·7 cm; 7-8 g. Distinctive, crested tyrannid. Nominate race has long crown feathers black with rufous edging, forming distinctive crest (sometimes erected and fanned, extends beyond rear crown when flat), whitish lores; upperparts olive; wings dusky, two buffy wingbars and yellow edgings, tail dusky; throat and upper breast white, streaked olive, flanks and underparts washed light yellow; iris yellow; bill grey; legs flesh-coloured. Sexes similar, female with crest less developed than male's. Juvenile undescribed. Race *luteiventris* has crown brown, lesser wing-coverts edged olive-green, median and greater coverts tipped greyish-white to yellowish olive-green, primaries edged olive-green, secondaries broadly edged yellowish-white, iris colour variable, orange-yellow to yellow; *sanctaeluciae* has throat and breast pale yellow, indistinct yellowish wingbars, flight-feathers edged olive; *squamaecrista* has wing-coverts less conspicuous with greenish edges, throat and chest with broader and darker streaks, flanks paler yellowish; *hypochlorus* is much yellower below, lateral edges of throat feathers olive-yellow instead of white, chest tinged greenish, abdomen bright yellow, flanks more greenish. Voice. Extremely loud trill sounding like a police whistle, as if from a much larger bird, often given persistently throughout day; also a series of sharp "preek" notes, sometimes widely spaced.
Habitat. Humid forest, older second growth, also in gaps and edges; foothills and lower slopes at 700-2100 m, locally 300-2300 m, occasionally down to 100 m. Favours stands of bamboo, especially on E slope of Andes.
Food and Feeding. Stomach contents in SE Peru included 30 prey items, of which beetles (Coleoptera) 62%, hymenopterans 16% (wasps 6%, ants 10%), hemipteran bugs 13%, homopterans 3%, arachnids 3%, other 3%. Perches inconspicuously in middle storey or lower canopy of dense forest; makes quick sallies out and upwards from hidden perch to strike at insects from undersides of leaves.
Breeding. Birds in breeding condition in Mar-Jun in Colombia. Bag-like domed nest with lateral side entrance, small awning projecting above entrance, and long, thin dangling streamer, constructed from fine, pale-coloured fibres, suspended from twig c. 3·5 m above ground. Clutch 2 eggs; apparently only female attends nest; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to common. Numerous both on Cerro Campana and in Cerro Azul-Jefe area, in Panama. Occurs in many national parks and other protected areas throughout its range. Given its tolerance of degraded and isolated habitats and its relatively large range, it is thought not likely to become threatened.
Bibliography. Anon. (1998a), Begazo (1995), Chapman (1921), Clements & Shany (2001), Cory & Hellmayr (1927), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995a), Meyer de Schauensee (1982), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), Salaman (1994), Schönwetter & Meise (1968), Skutch (1967), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Traylor (1977), Wetmore (1944, 1972), Williams & Tobias (1994), Zimmer (1930, 1940a).

141. **Long-crested Pygmy-tyrant**

Lophotriccus eulophotes

French: Microtyran eulophe **Spanish**: Cimerillo Crestilargo
German: Weißbauch-Schuppenkopftyrann

Taxonomy. *Lophotriccus eulophotes* Todd, 1925, River Purús, Amazonas, Brazil.
Probably forms a superspecies with *L. vitiosus*, and sometimes treated as conspecific. Monotypic.
Distribution. SW Amazonian Brazil (drainage of R Purus), SE Peru and NW Bolivia (Pando).



Descriptive notes. 10 cm; 6·5-8 g. Has long black crown feathers with grey edging, forming crest (sometimes erected and fanned, extends beyond rear crown when flat), whitish lores; upperparts olive, with wings and tail dusky; throat and underparts whitish, streaked grey; iris whitish-yellow; bill grey; legs flesh-coloured. Sexes alike. Juvenile undescribed. Voice. Typically, a series of 5-8 "tic" notes; also, occasionally utters a slightly descending trill.
Habitat. Riverine forest, swamp-forest, tall road-edge second growth, large stands of *Guadua* bamboo, also bamboo-dominated undergrowth, forest edges, and large treefall gaps. Occurs up to 400 m.

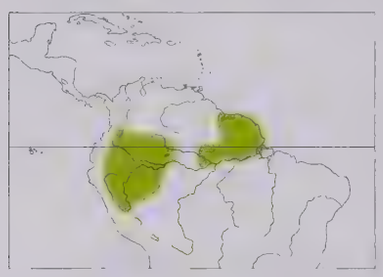
Food and Feeding. Insects. Forages mainly at 4-10 m, making short (1 m) upward strike-sallies to glean items from leaves and stems; sometimes follows mixed-species flocks in bamboo.
Breeding. Not documented.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Southeast Peruvian Lowlands EBA. Uncommon to fairly common, but local. Occurs in Manu National Park and Biosphere Reserve, in Peru. SE Peruvian lowland forests remain relatively intact, but mining, oil extraction and other development schemes, coupled with associated road-building and human intrusion, pose serious future threats; even the integrity of large protected areas such as Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone is not assured.
Bibliography. Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Forrester (1993), Gyldenstolpe (1950), Hennessey, Herzog & Sagot (2003), Meyer de Schauensee (1982), Parker & Remsen (1987), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Whittaker & Oren (1999).

142. **Double-banded Pygmy-tyrant**

Lophotriccus vitiosus

French: Microtyran bifascié **German**: Grau-Schuppenkopftyrann **Spanish**: Cimerillo Bilistado
Other common names: Golden-scaled Pygmy-tyrant (*congener*)

Taxonomy. *Cometornis vitiosus* Bangs and T. E. Penard, 1921, Sarayacu, River Ucayali, Peru.
Probably forms a superspecies with *L. eulophotes*, and sometimes treated as conspecific. Race *congener* thought by some to be possibly a separate species. Four subspecies recognized.
Subspecies and Distribution.
L. v. guianensis J. T. Zimmer, 1940 - the Guianas and NE Brazil (N of Amazon in N Pará and Amapá).
L. v. affinis J. T. Zimmer, 1940 - SE Colombia (from Meta S to Putumayo, Vaupés and Amazonas), NW Brazil (upper R Negro), E Ecuador and NE Peru (N of Amazon).
L. v. vitiosus (Bangs & T. E. Penard, 1921) - E Peru from E San Martín and S Loreto S to Huánuco.
L. v. congener Todd, 1925 - W Brazil (SW Amazonas) and E Peru (E of R Ucayali).



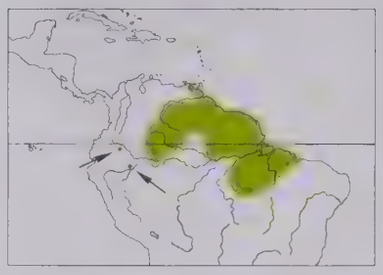
Descriptive notes. 10 cm; 6-8·5 g. Nominate race has long black crown feathers with grey edging, forming crest (erected and fanned less often than that of *L. pileatus*, extends beyond rear crown when flat), whitish lores; upperparts olive; wings dusky, two fairly distinct greenish-yellow wingbars and edgings, bend of wing yellow (usually concealed); tail dusky; throat and upper breast white, streaked dusky olive, flanks and crissum washed light yellow; iris straw-yellow; bill grey; legs flesh-coloured. Sexes similar, female crest less developed than male's. Juvenile undescribed. Race *guianensis* has stronger yellow underparts than nominate, crown feathers edged darker grey; *affinis* has breast and sides tinged olive, distinctly yellower belly; *congener* has whiter underparts, black crown feathers edged with buff-yellow. Voice. Harsh, buzzy trill, "turrrrrrr", often delivered in series; not so distinctly loud as that of *L. pileatus*.
Habitat. Humid tropical *terra firme* and *várzea* forest, forest borders, and second-growth forest, to 800 m.
Food and Feeding. Probably feeds mainly on insects. Perches inconspicuously in middle storey and canopy, and makes quick upward sallies to strike at undersides of leaves; rarely joins mixed-species flocks.
Breeding. Nests during dry season in Guianan region; nest-building in late Aug in NW Brazil and nearly finished nest observed in mid-Sept in Surinam; nest with 2 eggs in late Aug, Ecuador. Bag-like domed nest with downward-facing lateral entrance near bottom, small awning projecting above entrance hole, and short dangling tail, one 60 cm long (including tail), another 12 cm long and 7 cm in diameter, constructed from green moss and dry grass; suspended from tree branch c. 4 m above ground, sometimes over stream. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Rather poorly known species.
Bibliography. Blake (1962), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Friedmann (1948), Greeney *et al.* (2004), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty & Brown (1986), Meyer de Schauensee (1982), Novaes (1978a), Penard & Penard (1910), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977), Zimmer (1930, 1940a).

143. **Helmeted Pygmy-tyrant**

Lophotriccus galeatus

French: Microtyran casqué **Spanish**: Cimerillo de Casquete
German: Helm-Schuppenkopftyrann

Taxonomy. *Motacilla Galeata* Boddaert, 1783, Cayenne, French Guiana.
Formerly placed in a monotypic genus, *Colopteryx*, on grounds of narrow outer three primaries, but subsequently moved to present genus owing to overwhelming similarities (including anatomical characters) to current congeners. Monotypic.
Distribution. E Venezuela (Sucre, Monagas, Bolívar, Amazonas), the Guianas, E Colombia, NE Peru (Loreto) and N Brazil (N Amazonas E to Amapá and, S of Amazon, E from R Tapajós to Maranhão).
Descriptive notes. 10·2 cm; 6-7 g. Has long black crown feathers with greyish-olive edging, forming crest (sometimes erected and fanned), whitish lores; upperparts olive; wings dusky, two very indistinct olive wingbars and narrow edgings, outer three primaries shortened and narrow; tail dusky with olive edge; throat and underparts whitish, indistinctly streaked grey; iris yellowish to orangish-white; bill grey, pink base of lower mandible; legs flesh-coloured. Differs from similar *L. vitiosus* in having crown feathers narrower and more elongate, making crest less conspicuous, longer tail. Sexes alike. Juvenile undescribed. Voice. Series of 4-10 dry staccato "pik" or "trik" notes, sometimes ending in warbled or trilled phrase, pattern very similar to that of *L. pileatus* but voice not nearly so loud; sometimes sings constantly throughout heat of day.



Habitat. *Terra firme* and *várzea* forest and edge, also second growth and swampy or tall savanna woodland; also dry scrub on white sandy soils. To 1100 m. Most numerous in slightly drier, more scrubby white-sand forest (e.g. in Venezuela).
Food and Feeding. Insects. Forages usually alone, sometimes with mixed-species flocks, in mid-storey of forest; makes short sallies to strike at insects from underside of foliage, without hovering.
Breeding. Eggs in Mar and nestlings in late Sept in Surinam; birds in breeding condition in Feb-Apr in Venezuela. Bag-like domed nest with lateral entrance near bottom, small awning projecting above entrance, suspended from tree branch c. 2-10 m above ground. Clutch 2 or 3 eggs; chicks fed by both parents; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to common. Occurs in Alto Orinoco-Casiquiare Biosphere Reserve, in Venezuela, and Tapajós National Park, Rio Cristalino Forest Reserve and EMBRAPA Experimental Station, all in Brazil. Given that much of this species' habitat remains in relatively pristine condition within its range, it is not believed to be at any immediate risk. Only very recently discovered to occur in NE Peru.
Bibliography. Álvarez & Whitney (2003), Bangs & Penard (1918), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Friedmann (1948), Gilliard (1941), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Novaes (1978a), Oren & Parker (1997), Payne (1984), Penard & Penard (1910), Peres & Whittaker (1991), Ridgely & Tudor (1994), Schönwetter & Meise (1968), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977), Willard *et al.* (1991).

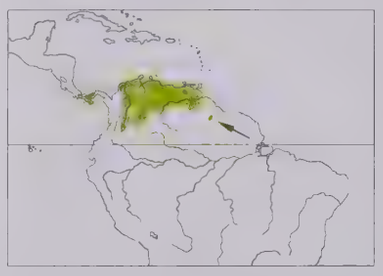
Genus *ATALOTRICCUS* Ridgway, 1905

144. **Pale-eyed Pygmy-tyrant**

Atalotriccus pilaris

French: Microtyran coiffé **German**: Blassaugen-Zwergtyrann **Spanish**: Mosquerito Ojiblanco
Other common names: White-eyed Pygmy-tyrant

Taxonomy. *C[olopterus] pilaris* Cabanis, 1847, Cartagena, Bolívar, Colombia.
Closely related to, and sometimes placed in, genus *Lophotriccus*, despite lack of a distinctive crown pattern. Race *venezuelensis* only marginally distinct from nominate, perhaps better subsumed in latter. Four subspecies recognized.
Subspecies and Distribution.
A. p. wilcoxi Griscom, 1924 - W Panama (Chiriquí E to Canal Zone).
A. p. pilaris (Cabanis, 1847) - N Colombia (Bolívar E to Guajira, S to Huila and Meta) and NW Venezuela (Zulia, Táchira).
A. p. venezuelensis Ridgway, 1906 - N Venezuela from Carabobo E to Sucre, and in *llanos* from W Apure E to Monagas.
A. p. griseiceps (Hellmayr, 1911) - E Colombia, EC Venezuela (N Amazonas, N Bolívar, Delta Amacuro) and W Guyana.



Descriptive notes. 9·7 cm; 6 g. Nominate race is olive above, head side buffy, lores whitish; wings dusky, two yellow wingbars, flight-feathers narrowly edged yellow, outer four primaries greatly reduced, shortened and narrow; tail dusky; throat and underparts whitish, streaked brown, flanks and crissum washed yellow; iris pale yellow-white, narrow buffy eyering; bill small, grey, pinkish base of lower mandible; legs flesh-coloured. Sexes similar, female has primaries slightly less reduced than male's. Juvenile has dark iris. Race *wilcoxi* is very like nominate, but upperparts slightly duller green, wing markings less distinct, underparts paler yellow; *venezuelensis* differs marginally from nominate, has crown greyer, back fresher green; *griseiceps* has smoky grey crown contrasting strongly with green of back (green duller than previous), orbital region and forehead tinged cinnamon buff. Voice. Very loud for size of bird; dry "tic" notes alone, or sometimes combined with trills as "tic-trrrrrrrrrr", "tic-tic trrrr" or "tic-tic-t-tr-tr-r-rreep", reminiscent of *Lophotriccus pileatus* in quality and pattern.
Habitat. Drier scrub-woodland, thickets, open woodland, also moister deciduous and semi-deciduous woodland, gallery forest; to 800 m, occasionally to 2000 m.
Food and Feeding. Insects. Forages alone or in pairs, sometimes with mixed-species flocks, low in dense vegetation. Makes short upward strikes (73% of foraging manoeuvres) or downward strikes (17%) to glean prey from leaves.
Breeding. Nests found in Jun-Jul in Venezuela; adults in breeding condition or young fledglings virtually throughout year. Often makes audible buzzing sound with rapid wing vibrations, presumably enhanced by modified outer primaries, perhaps as display. Hanging nest 0·3 m long, side entrance with small awning, made of fibres, often close to ground. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common; generally common in Venezuela. Reports from extreme N Brazil (around R Cotingo and R Urucury, in N Roraima) require confirmation. Species is fairly adaptable, able to thrive in secondary and other disturbed habitats.
Bibliography. Anon. (1998a), Blake (1962), Chapman (1917c), Cory & Hellmayr (1927), Eisenmann (1955), Fitzpatrick (1980c, 1981, 1985b), Friedmann & Smith (1950), Haffer (1975), Hilty (2003), Hilty & Brown (1986), McLellan (1938), Meyer de Schauensee (1982), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Snyder (1966), Stotz *et al.* (1996), Strewe & Navarro (2003), Traylor (1977), Traylor & Fitzpatrick (1982), Wetmore (1939, 1972), Willis (2003).

PLATE 25 ➤



PLATE 25

inches 3

cm 8

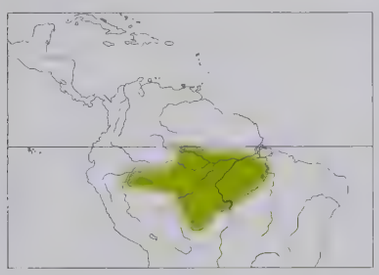
Genus *HEMITRICCUS* Cabanis & Heine, 1859

145. **Snethlage's Tody-tyrant**

Hemitriccus minor

French: Todirostre de Snethlage **German**: Kleintodityrann **Spanish**: Titirijí de Snethlage
Other common names: Lesser Tody-Tyrant

Taxonomy. *Euscarthmus zosterops minor* E. Snethlage, 1907, Arumateua, left bank, lower River Tocantins, central Pará, Brazil.
Formerly treated in a monotypic genus, *Snethlagea*, on basis of unusual nostril and bill shapes; these features, however, shared with *H. spodiops*, and some authors propose re-establishment of that genus, containing these two species. Previously considered conspecific with *H. minimus*. Race *pallens* possibly a separate species; specimens allegedly of this race from S Venezuela (Amazonas) require re-examination in light of recent significant taxonomic clarifications in this and related species. Nominate race and *snethlageae* difficult to differentiate, intergrade in C Amazonian Brazil (Pará); possibly better merged. Three subspecies recognized.
Subspecies and Distribution.
H. m. pallens (Todd, 1925) - WC Brazil on both sides of Amazon, from Amazonas (very near Peruvian border) E to W banks of R Negro and R Madeira.
H. m. snethlageae (E. H. Snethlage, 1937) - C Amazonian Brazil (from right bank of R Madeira E to right bank of R Tapajós, S to N Rondônia and NW Mato Grosso) and NE Bolivia (E Beni, Santa Cruz).
H. m. minor (E. Snethlage, 1907) - E Amazonian Brazil in C Pará (vicinity of lower R Xingú and R Tocantins).



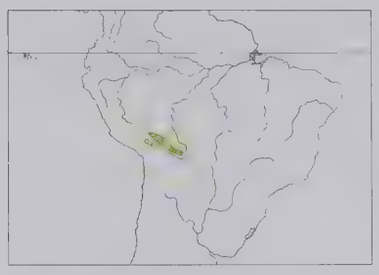
Descriptive notes. 10 cm; 7-7·9 g. Bill quite wide at base, with unusually large, rounded nostrils. Nominate race has crown and upperparts olive-green, crown feathers somewhat elongated (forming short bushy crest); wings and tail olive, two yellowish wingbars, greenish-yellow edges of remiges; throat and underparts pale yellow with indistinct greyish-olive streaking, centre of belly unstreaked; some individuals with all-white underparts; iris white to pale yellow; bill brown to blackish, lower mandible pinkish at base; legs grey to pinkish-grey. Distinguished from very similar *H. zosterops* by darker lores, less distinct wingbars, longer crown feathers, unusual nostrils. Female slightly brighter above and yellower below. Race *pallens* has underparts paler than nominate, wingbars more distinct; *snethlageae* is smaller overall, with tail shorter, wingbars yellower and more distinct, underparts brighter yellow. VOICE. Several variants of rapid, gravelly, nasal trills (similar to *Lophotriccus vitiosus*) often followed by series of "tic" notes; one variant (nominate race and *snethlageae*) with 35-75 notes delivered extremely rapidly (duration less than 1 second) all on one pitch, sounding more like a buzz than a trill, and given singly; another variant (*pallens*) has fewer notes (14-30) delivered slightly more slowly, and often in bouts of three or four songs in rapid succession; also, individual "tic" notes as a call.
Habitat. Tropical evergreen forest, mostly *terra firme* and tall second growth (nominate and *snethlageae*), or *igapó* (*pallens*); found especially in vine tangles and dense vegetation at edges and treefall gaps.
Food and Feeding. Insects. Forages singly or in pairs, 3-8 m above ground in dense vegetation; makes short upward strikes to glean prey from underside of leaves.
Breeding. No published information. Nest reported as being pendent, in style typical of other members of the genus.
Movements. Resident.
Status and Conservation. Not globally threatened. Locally fairly common to common. Occurs in Anavilhanas Ecological Station and Jaú National Park, in Brazil, and Noel Kempff Mercado National Park, in Bolivia.
Bibliography. Bates & Parker (1998), Bencke *et al.* (2001), Cohn-Haft (1996, 2000), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Cracraft (1985), Forrester (1993), Hilty (2003), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Parker *et al.* (1991), Remsen & Traylor (1989), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz (1992), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977), Zimmer (1940a).

146. **Yungas Tody-tyrant**

Hemitriccus spodiops

French: Todirostre de Bolivie **German**: Yungastodityrann **Spanish**: Titirijí Boliviano
Other common names: Grey-faced Tody-Tyrant

Taxonomy. *Euscarthmus spodiops* Berlepsch, 1901, Yungas of La Paz, western Bolivia.
Formerly treated in now defunct genus *Idioptilon*. Considered closely allied to *H. minor*; the two share unusual nostril and bill shapes, and thought by some authors possibly to merit separate generic rank via resurrection of genus *Snethlagea*. Monotypic.
Distribution. C Bolivia (La Paz, Cochabamba, W Santa Cruz).
Descriptive notes. 11 cm; 6·9-7·5 g. Bill quite broad-based, with unusually large, rounded nostrils. Crown and upperparts are dark olive-green, crown with elongated feathers forming short crest; lores greyish-buff; wings with two indistinct yellowish-olive wingbars; throat and breast greyish-olive with indistinct whitish streaking, lower belly clear yellowish-white; iris pale yellow; bill blackish; legs fleshy grey to flesh-coloured. Sexes alike. VOICE. Long, very fast, harsh trill dropping slightly in pitch throughout, usually given in bouts of 2-4 trills in rapid succession; much more reminiscent of *Lophotriccus pileatus* than of congeners.



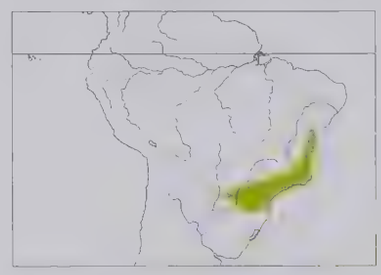
Habitat. Humid lower montane forest, bamboo, shrubby forest borders, tall second growth along roads and landslides; 800-1600 m, occasionally to 2450 m.
Food and Feeding. Insects. Forages alone, low in dense vegetation, usually only 1-3 m above ground; makes short upward strikes to glean prey from undersides of leaves.
Breeding. No documented information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Bolivian and Peruvian Lower Yungas EBA. Uncommon to locally common. At least 5 individuals/km of road recorded in Serranía Pilón, and 4 individuals/km of road at Calabatea (La Paz). Occurs in Pilón Lajas Biosphere Reserve and Madidi National Park. Forests in lower Yungas of Peru and Bolivia have been extensively converted for cultivation, especially cash crops such as coca and coffee. This species is, however, found in all protected areas in the Yungas of La Paz and Cochabamba.
Bibliography. Cohn-Haft (1996, 2000), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Green (1997a), Hennessey, Herzog, Kessler & Robinson (2003), Hennessey, Herzog & Sagot (2003), Lowen *et al.* (1995), Meyer de Schauensee (1982), Parker *et al.* (1991), Remsen & Traylor (1989), Remsen *et al.* (1982), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1977).

147. **Drab-breasted Pygmy-tyrant**

Hemitriccus diops

French: Todirostre à poitrine ombrée **German**: Weißstern-Todityrann **Spanish**: Titirijí Pechigrís
Other common names: Drab-breasted Bamboo-tyrant

Taxonomy. *Muscicapa diops* Temminck, 1822, Ipanema, São Paulo, Brazil.
Formerly included *H. obsoletus* and *H. flammulatus* as races. Monotypic.
Distribution. CE & SE Brazil (Bahia S to São Paulo, Paraná and N Rio Grande do Sul), E Paraguay and NE Argentina (Misiones).



Descriptive notes. 11 cm; 9·5-13·5 g. Has crown and upperparts plain dark olive-green; supraloral spot and conspicuous eyering white; wings and tail plain olive, sometimes paler border on innermost secondaries; throat and breast dull grey, tinged purplish or pinkish, with indistinct white crescent at centre of lower throat; belly clear whitish, crissum tinged yellow; iris reddish-brown; upper mandible grey, lower mandible pinkish; legs light grey. Sexes alike. VOICE. Short dry trill, sometimes doubled, "tr-r-r-r, tr-r-r-r"; also "bit", "sewit" or "bit-biwít", somewhat similar to calls of *Platyrinchus mystaceus*.
Habitat. Mature humid forest and second growth, especially in bamboo patches at edges or in understorey mixed with bamboo; to 1300 m.
Food and Feeding. Diet consists of insects. Forages alone or in pairs, generally in thick undergrowth, rarely with mixed-species flocks; makes short upward sallies to vegetation in order to glean prey.
Breeding. Nest purse-shaped and pendent, with side entrance, suspended from end of twig; nest parasitism by Pavonine Cuckoo (*Dromococcyx pavoninus*) reported. No other information available.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Common at Estancia Itabó Private Nature Reserve (Canindeyú), in Paraguay, and fairly common in Itatiaia and Serra dos Órgãos National Parks, in Brazil. Occurs also in Augusto Ruschi Biological Reserve, Patrimônio Natural do Caraça Special Reserve and Iguaçu and Tijuca National Parks, all in Brazil, and Caaguazú and San Rafael National Parks, in Paraguay.
Bibliography. Bauer & Pacheco (2000), Belton (1985), Bencke *et al.* (2001), Brooks *et al.* (1993), Canevari *et al.* (1991), Cory & Hellmayr (1927), Cracraft (1985), Develey (2004), Ferreira de Vasconcelos (2001), Ferreira de Vasconcelos & Melo-Júnior (2001), Hayes (1995), Ihering (1904), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Neunteufel (1951), Pacheco & Whitney (1995), de la Peña (1988), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Venturini *et al.* (2001).

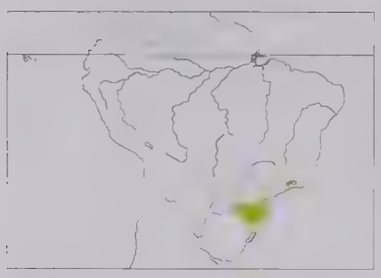
148. **Brown-breasted Pygmy-tyrant**

Hemitriccus obsoletus

French: Todirostre à poitrine brune **Spanish**: Titirijí Pechipardo
German: Braunbrust-Todityrann
Other common names: Brown-breasted Bamboo-tyrant

Taxonomy. *Musciphaga obsoleta* Miranda-Ribeiro, 1906, Itatiaia, Rio de Janeiro, Brazil.
Formerly considered conspecific with *H. diops*. Race *zimmeri* initially named as *naumburgae*, but that name preoccupied when genus was enlarged. Two subspecies recognized.
Subspecies and Distribution.
H. o. obsoletus (Miranda-Ribeiro, 1906) - SE Brazil, in W Rio de Janeiro (Serra do Itatiaia) and E São Paulo (Serra Bocaina and Serra Bananal).
H. o. zimmeri Traylor, 1979 - SE Brazil, in Paraná and Rio Grande do Sul, and extreme NE Argentina (Iguazú National Park).

On following pages: 149. Flammulated Pygmy-tyrant (*Hemitriccus flammulatus*); 150. Boat-billed Tody-tyrant (*Hemitriccus josephinae*); 151. White-eyed Tody-tyrant (*Hemitriccus zosterops*); 152. White-bellied Tody-tyrant (*Hemitriccus griseipectus*); 153. Eye-ringed Tody-tyrant (*Hemitriccus orbitatus*); 154. Johannes's Pygmy-tyrant (*Hemitriccus iohannis*); 155. Stripe-necked Tody-tyrant (*Hemitriccus striaticollis*); 156. Hangnest Tody-tyrant (*Hemitriccus nidipendulus*); 157. Pearly-vented Tody-Tyrant (*Hemitriccus margaritaceiventer*); 158. Pelzeln's Tody-tyrant (*Hemitriccus inornatus*); 159. Zimmer's Tody-tyrant (*Hemitriccus minimus*).



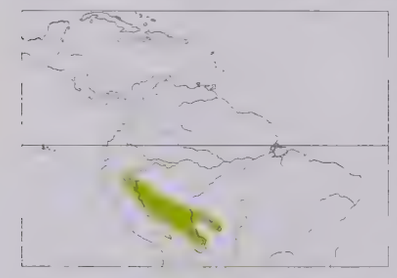
Descriptive notes. 11 cm; 9-11 g. Nominate race has crown and upperparts plain brownish-olive, supraloral buffy, forming distinct spot in front of eye, eyering pale buffy, side of head brownish; wings plain brownish-olive, tail dusky; throat and breast dingy buff, with indistinct buffy crescent around lower throat, belly clear buffy ochraceous, crissum tinged buffy yellow; iris reddish-brown; upper mandible grey, lower mandible pinkish; legs light grey. Sexes alike. Race *zimmeri* has upperparts more greenish than nominate, with breast and sides tinged slightly more ochraceous, belly and crissum more strongly ochraceous. Voice. Sharp, fast staccato notes, "tic-tic-tic, tic", slower and with each note more distinct than in the case of *H. diops*; also makes a buzzy "brrrrrr", created by wings.
Habitat. Mature humid tropical forest and older second growth, especially in bamboo patches; 500-2300 m, but usually replaced by *H. diops* below 1200 m.
Food and Feeding. Insects. Forages alone or in pairs in shady undergrowth, especially in bamboo thickets, usually only 1-3 m above ground; makes short upward strikes to glean prey from undersides of leaves.
Breeding. Nov-Dec in Rio Grande do Sul (SE Brazil). Nest unusual for genus, a globular ball 17·5 cm high and 16 cm wide, dome-shaped roof and deep inner cup (8 cm across and 7 cm deep), rounded side entrance shaded by small "visor" and with several bamboo leaves projecting from entrance, roof composed mainly of green moss and filamentous *Tillandsia* leaves, also black *Marasmius* fungal rhizomorphs, internal cup composed of bamboo leaves and plant down; attached to several vertical stalks of *Chusquea* bamboo c. 0·5 m above ground in dense bamboo thicket beneath mature forest. Clutch 2 eggs; no information available on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Atlantic Forest Mountains EBA. Uncommon to fairly common. Fairly common in N Rio Grande do Sul, Mata dos Godoy State Park (Paraná) and Itatiaia National Park, all in Brazil; found also in Iguazú National Park, in Argentina. Montane forests have suffered less destruction than have adjacent lowland areas, but isolated patches in N of this species' range have virtually disappeared owing to expansion of pasture and cultivation.
Bibliography. Bauer & Pacheco (2000), Belton (1985), Bencke *et al.* (2001), Buzzetti (2000), Cory & Hellmayr (1927), Cracraft (1985), Forrester (1993), Meyer de Schauensee (1982), Ridgely & Tudor (1994), do Rosário (1996), Saibene & Castelino (1993), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977).

149. Flammulated Pygmy-tyrant

Hemitriccus flammulatus

French: Todirostre flammulé **German**: Streifenbrust-Todityrann **Spanish**: Titirijí Flamulado
Other common names: Flammulated Bamboo-tyrant

Taxonomy. *Hemitriccus flammulatus* Berlepsch, 1901, San Mateo, Yungas of Cochabamba, Bolivia.
Formerly considered conspecific with *H. diops*. Two subspecies recognized.
Subspecies and Distribution.
H. f. flammulatus Berlepsch, 1901 - E Peru (San Martín S to Madre de Dios), NW Brazil (Acre, and R Mequéns in Rondônia) and N Bolivia (E to E Beni, S to Cochabamba).
H. f. olivascens (Todd, 1915) - E Bolivia (R Surutú, in Santa Cruz).



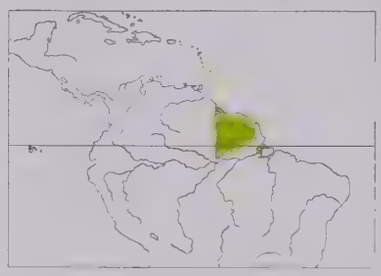
Descriptive notes. 11 cm; 8·8-11·7 g. Nominate race has crown and upperparts plain olive-green, dull whitish to buff-white supraloral spot and narrow eyering; wings and tail plain olive; throat whitish, streaked brownish-grey; breast buffy brown with pinkish tinge, belly clear white; iris reddish-brown to pale yellow; upper mandible dark grey to blackish, lower mandible pale pinkish-grey to white; legs light grey. Sexes alike. Race *olivascens* has upperparts more yellowish-olive, flanks and crissum tinged pale greenish-yellow. Voice. Sharp "tic" notes and fast rising trill, "tik-trrrrrríp", remarkably similar in tone to, but shorter than, trilled notes of *Poecilotriccus albifacies*, which occurs in same habitat.
Habitat. Mature, humid *terra firme* and dense second growth; almost always associated with *Guadua* bamboo, often found in large, pure bamboo stands. Mostly below 500 m, occasionally to 1300 m.
Food and Feeding. Arthropods. Stomach contents in SE Peru contained 19 prey items, of which beetles (Coleoptera) 33%, hemipterans 18%, homopteran bugs (planthoppers) 16%, lepidopteran larvae 16%, ants (Hymenoptera) 5%, spiders (Araneae) 5%, other 7%. Usually in pairs; rarely follows mixed-species flocks. Forages in undergrowth and middle storey of forest, favouring thick areas mixed with bamboo, and in leafy upper storey of mature bamboo stands; makes short upward sally-strikes against vegetation to glean prey.
Breeding. Birds with enlarged gonads in Aug-Nov in SE Peru. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common but local. Fairly common in Tambopata-Candamo Reserved Zone and Manu National Park and Biosphere Reserve, in Peru; and Beni and Pilón Lajas Biosphere Reserves and Madidi and Noel Kempff Mercado National Parks, all in Bolivia.
Bibliography. Allen (1995), Angehr & Aucca (1997), Bates & Parker (1998), Begazo (1995), Clements & Shany (2001), Cory & Hellmayr (1927), Forrester (1993), Hennessey, Herzog & Sagot (2003), Kratter (1997), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Zimmer (1940a).

150. Boat-billed Tody-tyrant

Hemitriccus josephinae

French: Todirostre de Joséphine **German**: Grauwangen-Todityrann **Spanish**: Titirijí de Josefina
Other common names: Josephine's Tody-tyrant

Taxonomy. *Euscarthmus josephinae* Chubb, 1914, Supenaam, west bank of Essequibo River, Guyana.
Formerly treated in a monotypic genus, *Microcochlearius*, because of rounded tail and unusually wide bill. Relationships within present genus remain unclear. Monotypic.
Distribution. The Guianas and NC Brazil (S to Manaus, and E to Amapá); probably also extends to S & E Venezuela.



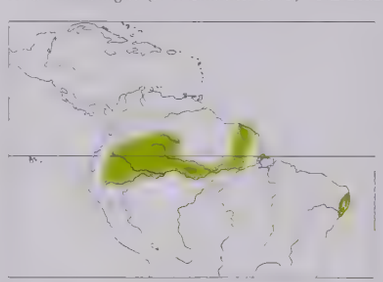
Descriptive notes. 11 cm; 10·2-10·8 g. Has crown and upperparts uniform dull olive, lores and auriculars pale grey; wings plain olive, tail dusky brownish-olive; throat dingy greyish-white, breast and belly clear pale yellow, crissum somewhat buffy; iris reddish-brown; bill grey, pale base of lower mandible; legs light grey. Sexes alike. Voice. Dry, descending "pic-pic-pic".
Habitat. Poorly known; normally encountered in humid tropical evergreen forest, most typically in vine tangles, treefall gaps and forest edge.
Food and Feeding. Probably insects. Alone or in pairs; sometimes joins mixed-species flocks. Forages in dense areas within middle storey of forest, mostly at 6-9 m, pausing for long periods; makes short upward sallies to vegetation to glean prey from foliage and branches.
Breeding. No information.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally rare. Occurs in Raleigh Falls-Voltzberg National Park and Sipaliwini Savanna Nature Reserve, both in Surinam. Poorly known.
Bibliography. Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Donahue (1985), Forrester (1993), Haverschmidt & Mees (1994), Hilty (2003), Meyer de Schauensee (1982), Novaes (1978a), Ridgely & Tudor (1994), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977).

151. White-eyed Tody-tyrant

Hemitriccus zosterops

French: Todirostre zostérops **German**: Weißaugen-Todityrann **Spanish**: Titirijí Ojiblanco

Taxonomy. *Euscarthmus Zosterops* Pelzeln, 1868, Marabitanas, Rio Negro, Brazil.
Formerly placed in genus *Euscarthmornis* and, more recently, *Idioptilon*, both now defunct. Was for long treated as conspecific with *H. griseipectus*, but the two exhibit major differences in plumage and voice; vocal characters suggest that geographically isolated race *naumburgae* may belong with that species. E Amazonian populations vocally distinct from those W of R Branco and R Negro, suggesting that two distinct species may be involved; birds from French Guiana described as race *rothschildi*, and that name (currently synonymized with nominate) would be available for E form, if found to be a separate species. Boundary between nominate race and *flaviviridis* uncertain, as vocal type of former occurs only E of R Branco and R Negro, in N Brazil, and that of latter extends E to those rivers; has been proposed by some authors that the two races be merged. Three subspecies recognized.
Subspecies and Distribution.
H. z. zosterops (Pelzeln, 1868) - SE Colombia (Caquetá, Vaupés), E Ecuador and NE Peru (Loreto) through S Venezuela (S Amazonas) and much of Brazil N of Amazon (Amazonas, NW Pará, Amapá) to E Surinam and French Guiana.
H. z. flaviviridis (J. T. Zimmer, 1940) - N Peru (C Amazonas, N San Martín).
H. z. naumburgae (J. T. Zimmer, 1945) - NE Brazil (Rio Grande do Norte S to Alagoas).



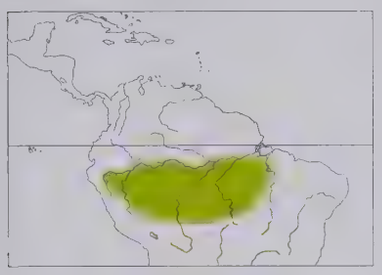
Descriptive notes. 11 cm; 7·8-10 g. Nominate race has crown and upperparts olive-green, supraloral area whitish, indistinct white eyering; wings dusky, two fairly distinct yellowish wingbars, bright olive-yellow edges of remiges; tail dusky olive; throat grey, streaked dusky, breast and flanks olive, flammulated yellow, belly clear pale yellow; iris pale grey or straw-yellow (sometimes reddish-brown); bill black, base of lower mandible pinkish; legs dark grey. Sexes similar. Race *flaviviridis* is brighter than nominate, more yellowish-green above, underparts with stronger yellow flammulation (presenting greener, less grey, tinge); *naumburgae* has upperparts paler, yellower green, belly whitish. Voice. Nominate race song type a dry 1-second trill, rising and then falling slightly in pitch, slowing towards end, and immediately preceded by distinct single note (very similar to songs of *H. minor* and *Lophotriccus*, but with initial distinct note and gradually slowing during trill); *flaviviridis* an insect-like, staccato series of 5-11 notes with metallic tonal quality and on same pitch, sometimes introduced or concluded by separate, distinctly higher note, "pik, pik-pik-pik-pik"; *naumburgae* primary song "kwidíp" or "kwididíp", similar to that of *H. griseipectus*.
Habitat. Occupies humid *terra firme* forest, especially in hilly terrain and foothills; recorded up to 850 m.
Food and Feeding. Usually solitary, occasionally in pairs; only occasionally follows mixed-species flocks. Perches inconspicuously, but often on very open perches in lower and middle growth of forest below canopy; makes short upward strikes to glean prey from undersides of leaves.
Breeding. No published information. Nest reported as being pendent.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Fairly common in Serranías Cofán (Sucumbíos), in Ecuador; occurs also in Jaú National Park, in Brazil. Isolated NE Brazilian race *naumburgae* is poorly known; present in Mata Estrela Private Reserve (Rio Grande do Norte), Murici Ecological Reserve (Alagoas) and Pedra Branca/Fazenda Bananeira Reserve (Alagoas).
Bibliography. Bencke *et al.* (2001), Chapman (1917c), Clements & Shany (2001), Cohn-Haft (1996, 2000), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Novaes (1978a), Peres & Whittaker (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Silveira *et al.* (2003), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992), Traylor (1977), Willard *et al.* (1991), Zimmer (1940a).

152. White-bellied Tody-tyrant

Hemitriccus griseipectus

French: Todirostre à ventre blanc **Spanish**: Titirijí Ventriblanco
German: Weißbauch-Todityrann

Taxonomy. *Euscarthmus griseipectus* E. Snethlage, 1907, Alcobaça, River Tocantins, Brazil.
Has often been considered conspecific with *H. zosterops*, but the two show major differences in plumage and voice; vocal characters suggest that race *naumburgae* of that species may belong with present species. Monotypic.
Distribution. C Brazil S of Amazon (C Amazonas E to R Tocantins) S to SE Peru (Cuzco, N Puno) and N Bolivia (Pando, La Paz, Beni).



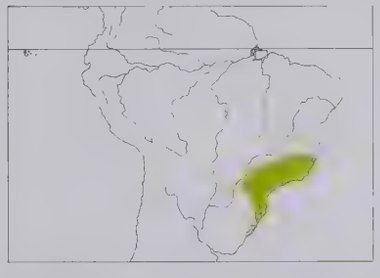
Descriptive notes. 11 cm; 7·9-10 g. Has crown and upperparts olive-green, loral area pale, indistinct whitish eyering; wings dusky, two fairly distinct yellowish wingbars, olive-yellow edgings; throat greyish-white, streaked dusky, breast greyish, belly clear whitish; iris white, very pale grey, or straw-yellow; bill black, base of lower mandible pinkish; legs grey to dark grey. Sexes alike. Voice. Rising couplet or triplet of nasal to metallic notes, rapid and high-pitched, "ca-déék" or "kee-dee-deek", given at intervals from 2-3 seconds to 30 seconds.
Habitat. Humid tropical *terra firme* and transitional forest in low country, hills and base of foothills.
Food and Feeding. Insects. Forages alone, more rarely in pairs, very rarely joining mixed-species flocks. Perches inconspicuously, but usually on quite open perches well below canopy, 10-20 m above ground; pauses 30-60 seconds on each perch, making short upward sallies to underside of vegetation to glean prey.
Breeding. Birds with enlarged gonads in Sept-Oct in SE Peru. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Common in Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru; also occurs in Beni and Pilón Lajas Biosphere Reserves and Madidi National Park, all in Bolivia.
Bibliography. Allen (1995), Clements & Shany (2001), Cohn-Haft (2000), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Forrester (1993), Gyldenstolpe (1950), Hennessey, Herzog, Kessler & Robinson (2003), Hennessey, Herzog & Sagot (2003), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schubart *et al.* (1965), Stotz *et al.* (1996), Traylor (1977), Zimmer (1940a).

153. Eye-ringed Tody-tyrant

Hemitriccus orbitatus

French: Todirostre à lunettes **German**: Augenring-Todityrann **Spanish**: Titirijí de Anteojos
Other common names: Olivaceous Tody-tyrant

Taxonomy. *E[uscarthmus] orbitatus* Wied, 1831, River Doce, Espírito Santo, Brazil.
Formerly treated in genus *Euscarthmornis* and later in *Idioptilon*, both now defunct. Monotypic.
Distribution. SE Brazil, from E Minas Gerais and Espírito Santo S to Rio Grande do Sul.



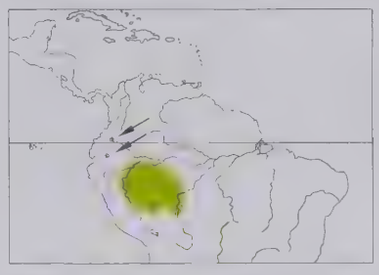
Descriptive notes. 11·5 cm; 9-10·5 g. Has crown and upperparts plain dark olive, prominent white supraloral spot and wide white eyering; wings olive, prominent white border on outer webs of innermost remiges; tail dusky olive; throat greyish-white, breast washed olive, both streaked with darker olive, rest of underparts yellow; iris dark brown; upper mandible grey, lower mandible pale; legs light grey. Sexes alike. Voice. Rapid squeaky trill, "tr-r-r-r-r-r-r-r-r", or "tirrit, tirritit".
Habitat. Humid forest and second growth, from near sea-level to 600 m, infrequently to 1000 m.
Food and Feeding. Insects. Forages alone or in pairs in lower and middle growth of forest, most often in interior away from forest edge. Perches vertically on exposed branches under canopy; makes short upward strikes to glean prey from undersides of leaves.
Breeding. Few data. No published description of nest, but reported as usually building hanging purse with side entrance, typical of genus, also (one of four nests) a non-hanging ball-shaped nest. Clutch 2 eggs.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Locally uncommon to fairly common. Common at lower elevations in Serra dos Órgãos (Rio de Janeiro) and common at Patrimônio Natural de Volta Velha Special Reserve, near Itapoá (Santa Catarina); fairly common in N Rio Grande do Sul, but rare at Saibadela Research Station (in Intervales State Park); occurs also at Salto do Piraí (Santa Catarina), Serra Paranapiacaba International Biosphere Reserve and Tijuca National Park. Deforestation, agricultural conversion, mining, urbanization and industrialization, with associated road-building, have left less than 20% of original Atlantic Forest intact; remaining lowland forests continue to be cleared.
Bibliography. Aleixo & Galetti (1997), Belton (1985), Bencke *et al.* (2001), Buzzetti (2000), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Develey (2004), Forrester (1993), Meyer de Schauensee (1982), Parker *et al.* (1996), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Traylor (1977).

154. Johannes's Pygmy-tyrant

Hemitriccus iohannis

French: Todirostre de Johannes **German**: Braunzügel-Todityrann **Spanish**: Titirijí de Johannes
Other common names: Johannes's Tody-tyrant

Taxonomy. *Euscarthmus iohannis* E. Snethlage, 1907, Monte Verde, River Purús, Brazil.
Formerly treated in genus *Euscarthmornis* and later in *Idioptilon*, both now defunct. Was considered conspecific with *H. striaticollis*, but the two occur sympatrically at several localities in Peru and Bolivia. Monotypic.
Distribution. SW Amazonia in E Peru (S to Madre de Dios), W Brazil (E to upper R Solimões, R Juruá and R Purus) and N Bolivia (Pando, Beni); also isolated localities in S Colombia (Putumayo) and E Ecuador (Kapawi), and probably more widespread.



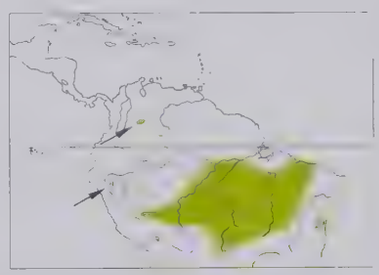
Descriptive notes. 11 cm; 9·2-12·7 g. Crown and upperparts are uniform bright olive, lores and ocular area brownish, sometimes with white supraloral spot; wings dusky olive, indistinct yellow edges of remiges, two indistinct yellow wingbars; throat whitish with very fine black streaks, underparts pale yellow with blurry streaking, breast side and flanks smudged olive; iris whitish to pale straw-yellow; bill dark grey to blackish; legs pale yellowish, pinkish or light grey. Sexes alike. Voice. Distinctive, fast staccato trill with separate introductory note, "tik-trrrrrrrrrrrrrrrrree", rising at end.
Habitat. Humid tropical secondary growth and, especially, riparian woodland and brush, usually in vine tangles or dense shrubby growth; also in mature river-edge cane interspersed with vines and leafy saplings. Up to 600 m.
Food and Feeding. Arthropods. Stomach contents in SE Peru contained 35 prey items, of which hymenopterans 32% (ants 29%, wasps 3%), homopteran bugs (planthoppers) 29%, coleopterans 26%, orthopterans 6%, true bugs (Hemiptera) 3%, spiders (Araneae) 3%. Forages alone, in pairs, or in small family groups; typically, does not follow mixed-species flocks. Perches in middle and upper growth of dense brushy growth and vine thickets; makes short upward strikes to glean prey from undersides of leaves.
Breeding. Birds with enlarged gonads late Jul to late Oct in SE Peru. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Considered to be rare to locally fairly common. Fairly common at Amazonia Lodge (Cuzco), in Peru, where also occurs in Manu National Park and Biosphere Reserve, Pacaya-Samiria National Reserve and Tambopata-Candamo Reserved Zone. Also found in Kapawi Ecological Reserve, in Ecuador, and in Madidi National Park, in Bolivia.
Bibliography. Allen (1995), Begazo (1995), Begazo & Valqui (1998), Clements & Shany (2001), Cory & Hellmayr (1927), Gyldenstolpe (1950), Hennessey, Herzog & Sagot (2003), Hilty & Brown (1986), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Schulenberg *et al.* (2001), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1958, 1977, 1982), Zimmer (1940a).

155. Stripe-necked Tody-tyrant

Hemitriccus striaticollis

French: Todirostre à cou rayé **German**: Streifenkehl-Todityrann **Spanish**: Titirijí Gorgiestriado

Taxonomy. *Todirostrum striaticolle* Lafresnaye, 1853, Bahia, Brazil.
Formerly treated in genus *Euscarthmornis* and later in *Idioptilon*, both now defunct. Was considered conspecific with *H. iohannis*, but the two occur sympatrically at several localities in Peru and Bolivia. Validity of race *griseiceps* doubtful. Birds from N Peru and C Brazil (Mato Grosso), supposedly with darker crown and more olive wash on breast side, described as a third race, *obscuriceps*; considered indistinguishable from nominate because of range of individual variation in latter. Two subspecies recognized.
Subspecies and Distribution.
H. s. striaticollis (Lafresnaye, 1853) - E Colombia (Meta); N Peru (San Martín); and from S Peru (Cuzco, Madre de Dios) and N Bolivia (Beni) to C & E Brazil (upper R Madeira E to Maranhão, and S to Mato Grosso, Goiás and Minas Gerais; E Bahia).
H. s. griseiceps (Todd, 1925) - E Amazonian Brazil in W Pará (lower R Tapajós).



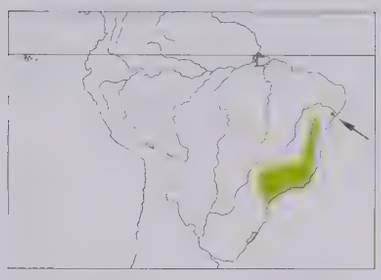
Descriptive notes. 11 cm; 7·8-11 g. Nominate race has greyish-brown crown contrasting with olive upperparts; large white supraloral spot and white eyering; wings plain olive, indistinct yellow edges of remiges; tail dusky olive; throat white with sharp, distinct brownish streaks, streaks continuing onto breast, underparts bright yellow, tinged greenish and diffusely streaked on flanks; iris whitish to pale yellow; bill blackish, paler near base of lower mandible; legs light grey. Sexes similar. Juvenile has darker iris. Race *griseiceps* has upperparts duller green and crown more pure grey than nominate. Voice. Fast "pit-pit-pit-pit, whi-didit" or "bewet-bewit béé-bibit", sometimes without introductory "pit" notes.
Habitat. Mainly found in humid to semi-humid secondary woodland and riparian growth, low thickets, and bamboo, most often in semi-open country; recorded up to 700 m, occasionally to 1000 m.
Food and Feeding. Insects. Forages alone or in pairs in dense middle and upper growth of low-stature forest, shrubby edges, vine tangles, and bamboo; makes short upward strikes to glean prey from undersides of leaves.
Breeding. Nest not described; clutch 2 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally uncommon to locally fairly common. Occurs in Tambopata-Candamo Reserved Zone, in Peru, Beni Biosphere Reserve and Noel Kempff Mercado National Park, both in Bolivia, and Pantanal Mato-grossense and Tapajós National Parks, both in Brazil. Status of two small disjunct populations, one in E Colombia (Carimagua and Laguna Mozambique, in Meta) and the other in NE Peru (Moyobamba, in San Martín), not known.
Bibliography. Bates & Parker (1998), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Dubs (1992), Forrester (1993), Hennessey, Herzog & Sagot (2003), Hilty & Brown (1986), Kirwan *et al.* (2004), Meyer de Schauensee (1982), Oren & Parker (1997), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977, 1982), Willis & Oniki (1990, 1991), Zimmer (1940a).

156. Hangnest Tody-tyrant

Hemitriccus nidipendulus

French: Todirostre de Wied **German**: Grünrücken-Todityrann **Spanish**: Titirijí de Wied

Taxonomy. *E[uscarthmus] nidipendulus* Wied, 1831, River Mucuri, Bahia, Brazil.
Formerly treated in the defunct genus *Idioptilon*. Two subspecies recognized.
Subspecies and Distribution.
H. n. nidipendulus (Wied, 1831) - Sergipe (Itabaiana Reserve) and Bahia (Bonfim), in E Brazil.
H. n. paulistus (Hellmayr, 1914) - CE & SE Brazil (S Minas Gerais and Espírito Santo S to Rio de Janeiro and São Paulo).



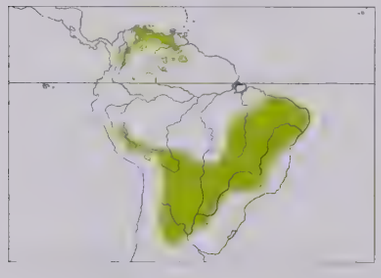
Descriptive notes. 9·5-10 cm; 7·2-8 g. Crown, face and upperparts are bright olive-green, lores somewhat more yellowish; wings and tail olive, distinct yellow edging on wing-coverts and flight-feathers; throat and underparts white, breast and, especially, flanks with faint greyish-olive streaks; iris creamy white; bill brown, base of lower mandible greyish flesh-coloured; legs light grey. Sexes alike. Race *paulistus* is slightly larger and has longer tail than nominate. Voice. Fast "weet-weet-weet" or "tic, prrew-prrew-prrew" and clear high "tiréé-téélili téélili téélili", a syncopated series unlike voice of any congeners, and reminiscent of *Todirostrum*.
Habitat. *Restinga*; humid evergreen forest, especially dense woodland, secondary forest, and *Pteridium aquilinum* thickets in foothills; from near sea-level to 900 m.
Food and Feeding. Insects. Forages alone, occasionally in pairs, in lower growth of forest, usually inside thickets and tangles; makes short upward strikes to glean prey from leaf undersides.
Breeding. Nest with eggs in early Oct. Nest domed, pyriform, with side entrance, constructed from dry stems, rootlets, leaves of *Spartina* grass and other plant material, lined with hair, suspended from twig c. 1·5 m above stream; one was 8 cm in maximum diameter, 13 cm long, with streamer 26 cm long of dangling dry leaves, entrance hole 3 cm across, protected by awning 4 cm long. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to common. Common in Patrimônio Natural do Caraça Special Reserve and in Mata dos Godoy State Park (Paraná). Also occurs in Itabaiana Reserve (Sergipe), Serra Paranapiacaba International Biosphere Reserve and Itatiaia National Park. Recent observations at Itabaiana represent the most NE records to date.
Bibliography. Bauer & Pacheco (2000), Cohn-Haft (1996), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Euler (1900), Ferreira de Vasconcelos & Melo-Júnior (2001), Forrester (1993), Ihering (1900), Meyer de Schauensee (1982), Pacheco & Whitney (1995), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Tobias *et al.* (1993), Traylor (1977).

157. Pearly-vented Tody-Tyrant

Hemitriccus margaritaceiventer

French: Todirostre à ventre perle **German**: Perlbauch-Todityrann **Spanish**: Titirijí Perlado

Taxonomy. *T[odirostrum] margaritaceiventer* d'Orbigny and Lafresnaye, 1837, Chiquitos, Santa Cruz, Bolivia.
Formerly treated in genera *Euscarthmornis* and *Idioptilon*, both now defunct. Previously considered conspecific with *H. inornatus*. Recently described isolated race *chiribiquetensis* demonstrates closer affinity to Andean forms than to nearby tepui populations. Race *septentrionalis* perhaps indistinguishable, may be better merged with *impiger*. Nine subspecies recognized.
Subspecies and Distribution.
H. m. impiger (P. L. Sclater & Salvin, 1868) - NC Colombia (Magdalena S to Santander) and N Venezuela (N & W Zulia E to Sucre and C Anzoátegui, including Margarita I).
H. m. septentrionalis (Chapman, 1914) - C Colombia (upper Magdalena Valley S from N Tolima).
H. m. chiribiquetensis Stiles, 1995 - Sierra de Chiribiquete (Caquetá), in S Colombia.
H. m. duidae (Chapman, 1929) - Cerro Duida (Amazonas), in S Venezuela.
H. m. breweri (Phelps, Jr, 1977) - SW Bolívar (Massif of Jaua), in S Venezuela.
H. m. auyantepui (Gilliard, 1941) - tepuis of SE Bolívar (SE Venezuela).
H. m. rufipes (Tschudi, 1844) - arid valleys of C & S Peru (S from Junín and Cuzco) S to NW Bolivia (La Paz, S Beni).
H. m. wuchereri (P. L. Sclater & Salvin, 1873) - NE Brazil (Maranhão, Ceará, Pernambuco, Bahia).
H. m. margaritaceiventer (d'Orbigny & Lafresnaye, 1837) - E & SE Bolivia, EC & S Brazil (Mato Grosso and Goiás S to W Minas Gerais and São Paulo), Paraguay and NE Argentina (S to Córdoba and Entre Ríos).



Descriptive notes. 10-10·5 cm; 7-10 g. A drab, greyish, long-billed pygmy-tyrant of dry country. Nominate race is plain, drab greyish-brown to brownish-olive above, crown somewhat more grey, lores and eyering whitish; wings dusky, buff-whitish to yellow wingbars and edges of remiges; tail dusky; throat and underparts white with indistinct greyish streaking; iris pale straw-coloured, "bloodshot" orange, or pale hazel; bill reddish-brown to blackish, lower mandible pinkish-brown to flesh-coloured; legs pink to pale greyish-flesh. Sexes alike. Race *impiger* has deep buff-brown crown and upper back; *septentrionalis* has greyer upperparts, blacker and more rounded bill; *chiribiquetensis* is most like previous, but upperparts greyer, crown darker, wingbars paler and more contrasting, streaks on throat much more pronounced and blacker, flanks more tinged with yellow; *duidae* has dark brown upperparts, buffy to pale orange-yellow belly, reddish bill; *auyantepui* has grey-white belly, upperparts medium brown with only slight olivaceous tinge; *breweri* rather dark, with pale ochraceous-buff belly; *rufipes* has top of head more olivaceous-tinged (especially posteriorly), yellower flanks and crissum; *wuchereri* has back much less greenish, throat more distinctly streaked. Voice. Most often a series of sharp staccato notes followed by brief to long, musical trill that may rise or, more often, fall in pitch, "tick-tick-tr'r'r'r'r'r'r'r", sometimes staccato notes given alone; also brief nasal trill or soft, mechanical, frog-like buzz; call notes, frequently given while foraging, are loud, sharp "tuk, tuk, quéek, quéek", or 2-4 "quéek" notes each higher-pitched than preceding one.
Habitat. Mainly shrubby, arid to semi-arid scrub, lower growth of taller deciduous woodland, and shrubby cattle pastures, less often dense riparian growth; also dense heath-like scrub on Gran Sabana (Venezuela) and *Bonnetia* scrub in Sierra de Chiribiquete (S Colombia). Sea-level to 2000 m, mostly below 1000 m.
Food and Feeding. Insects. Forages alone or, more frequently, in pairs at lower to middle heights in shrubs and low trees, sometimes within a few centimetres of ground, mainly at eye level; makes brief pauses and short upward strikes to glean insects from leaf undersides.
Breeding. Jan-Jun in Colombia, Oct-Dec in Peru, Bolivia and Argentina. Nest a hanging elongated purse, domed, with lateral entrance near bottom, small awning projecting above entrance, constructed from dry grass blades, fine plant fibres and varying amount of plant down, profusely lined with whitish to deep rusty-buff plant down, suspended 0·5-3 m above ground from drooping branch of tree, shrub or herbaceous plant. Clutch 2-3 eggs, most commonly 2, occasionally 1; no information on incubation period; nestling period 13-14 days.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common. Occurs in Beni Biosphere Reserve and Madidi and Noel Kempff Mercado National Parks, all in Bolivia, Caaguazú, San Rafael, San Luis and Ybycuí National Parks, all in Paraguay, and San Juan de Poriahú Private Reserve (in Iberá Provincial Reserve), in Argentina. In Brazil, occurs in Mata dos Godoy State Park (Paraná) and Brasília and Serra da Canastra National Parks, and reported also from Mata Estrela Private Reserve (Rio Grande do Norte). Range may extend farther S in E parts, as this species has been reported from Cerro Corá National Park, in Uruguay.
Bibliography. Bates & Parker (1998), Brooks *et al.* (1993), Canevari *et al.* (1991), Chapman (1914, 1931), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Davis (1993), Di Giacomo (2004), Dubs (1992), Fitzpatrick (1980c), Fjeldså & Maijer (1996), Friedmann (1927), Friedmann & Smith (1950), Gilliard (1941),, Hayes (1995), Hilty (2003), Hilty & Brown (1986), Ihering (1900), López (1997), Lowen *et al.* (1996), Mayr & Phelps (1967), Meyer de Schauensee & Phelps (1978), Miserendino (1998), Narosky & Salvador (1998), de la Peña (1987, 1988, 1996), Ridgely & Tudor (1994), Schmitt *et al.* (1997), Short (1975), Sick (1993, 1997), Stiles (1995), Stotz *et al.* (1996), Todd & Carriker (1922), Traylor (1977), Wetmore (1926, 1939), Willis & Oniki (1990), Zimmer (1940a).

158. Pelzeln's Tody-tyrant

Hemitriccus inornatus

French: Todirostre de Pelzeln **German**: Pelzelntodityrann **Spanish**: Titirijí de Pelzeln

Taxonomy. *Euscarthmus inornatus* Pelzeln, 1868, River Içana, right bank of upper Rio Negro, north-west Brazil.
Thought to form a superspecies with *H. minimus* on basis of complementary distributions and similarities in habitat and voice. Formerly considered a race of *H. margaritaceiventer*. Monotypic.
Distribution. Very locally on R Negro and tributaries, in NW Brazil; probably also in adjacent Venezuela and Colombia.



Descriptive notes. 9 cm; 7·7-9 g. Crown and upperparts are brownish-olive, lores and narrow eyering whitish; wings and tail dusky olive-brown, whitish edgings of flight-feathers, whitish tips of wing-coverts (narrow wingbars); throat and underparts white with indistinct greyish streaking; iris whitish to pale grey; bill grey; legs grey. Differs from similar *H. margaritaceiventer impiger* by slightly smaller size, tone of upperparts, whiter (less yellow) wingbars. Sexes alike. Voice. Stuttered trill, short set of rapidly delivered low, insect-like notes, "tid-dip, tid, te'de" with scraping quality; very similar to *H. minimus*.
Habitat. Inhabits tall to stunted, patchily distributed white-sand woodland (known locally as *campinarana*).
Food and Feeding. Few data. Forages in low canopy and subcanopy, presumably making upward strikes similar to those of other members of genus.
Breeding. No information.
Movements. Presumably resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Orinoco-Negro White-sand Forests EBA. Locally common. Until recently, known only from a single 19th-century specimen (Jun 1831) from R Içana, a right-bank tributary of upper R Negro in NW Brazil. Rediscovered in Oct 1992, on E bank of lower R Negro (45 km N of Manaus), and found there again in Feb 1993, thus extending the species' range by c. 1000 km; has subsequently been discovered also on R Apuaú and R Cuieras, which are right-bank tributaries of R Negro. Much of its habitat remains in relatively pristine condition owing to low human population density and inaccessibility, but cattle grazing, extraction of white sands, gold-mining and diamond-mining, and frequent fires pose serious local threats. Possible presence of this species in adjacent parts of Venezuela and Colombia should be investigated.
Bibliography. Cohn-Haft (2000), Cory & Hellmayr (1927), Forrester (1993), Hilty (2003), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Whittaker (1994).

159. Zimmer's Tody-tyrant

Hemitriccus minimus

French: Todirostre de Zimmer **German**: Zwergtodityrann **Spanish**: Titirijí de Zimmer

Taxonomy. *Snethlagea minima* Todd, 1925, Itaituba, River Tapajós, Brazil.
Thought to form a superspecies with *H. inornatus* on basis of complementary distributions and similarities in habitat and voice. Was for long regarded as a weakly defined race of *H. minor*; recent study of original series of specimens, however, revealed existence of two separate species, also that described taxon *H. aenigma* is identical to holotype of present species, with which therefore synonymized. Monotypic.
Distribution. Scattered Amazonian localities in SE Ecuador (Kapawi), NE Peru (near Iquitos), Brazil (NW Acre and Amazonas E to Manaus and S Pará), and NE Bolivia (W of Versalles, in Beni;

Serranía de Huanchaca, in Santa Cruz); suspected to occur widely across Amazonia where appropriate habitat exists.



Descriptive notes. 10 cm; 6-8 g. Has upperparts brownish-olive, darker brown crown streaked darker dusky; lores and indistinct eyering buffy, auriculars brown; wings dusky, two distinct yellowish wingbars, yellow edges of inner flight-feathers and less distinct yellow on outer remiges (two-toned effect); throat white with distinct dusky streaking, lower throat, breast and sides yellowish olive-buff with indistinct dusky streaking, centre of belly pale yellow; iris white to pale straw-coloured; bill black, lighter at base; legs grey to pinkish-grey. Sexes alike. Voice. Soft, twittering, tinkling, ventriloquial trills that are rather loud (but difficult to locate), similar to calls of *H. inornatus* but lacking two-part stuttering rhythm. Also possible dawn song, 1-4 evenly spaced single notes at both beginning and end of a tight burst of c. 3 notes of greater frequency range and higher peak frequency, the whole lasting c. 1·5 seconds.

Habitat. Stunted forest and vine tangles in black-water regions, on nutrient-poor sandy soil, this vegetation formation often called *campinarana*; recorded up to 450 m.

Food and Feeding. Insects. Forages in pairs in crowns of stunted forest trees (9-12 m), and at similar heights among viny tangles in foliage of taller forest; makes short upward strikes typical of genus.

Breeding. No information.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon and very local. Occurs in Rio Cristalino Forest Reserve and Jaú and Tapajós National Parks, in Brazil; Kapawi Ecological Reserve, in Ecuador; and Noel Kempff Mercado National Park, in Bolivia. Very poorly known.

Bibliography. Álvarez & Whitney (2003), Anderson (1981), Bates & Parker (1998), Bates, Parker *et al.* (1992), Bates, Stotz & Schulenberg (1998), Borges *et al.* (2000), Cohn-Haft (2000), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Forrester (1993), Hennessey, Herzog & Sagot (2003), Meyer de Schauensee (1982), Oren & Parker (1997), Parker *et al.* (1991), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz (1992), Stotz *et al.* (1996), Zimmer, J.T. (1940a), Zimmer, K.J. *et al.* (1997).



PLATE 26

inches 2
cm 5

160. **Black-throated Tody-tyrant**

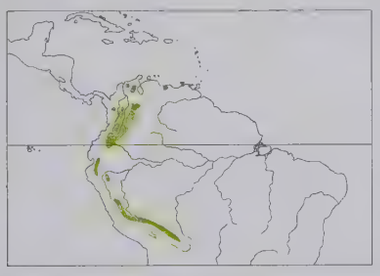
Hemitriccus granadensis

French: Todirostre à gorge noire **German**: Schwarzkehl-Todityrann **Spanish**: Titirijí Gorginegro

Taxonomy. *Todirostrum granadense* Hartlaub, 1843, "Bogotá" = Santa Elena, Antioquia, Colombia. Formerly treated in genus *Euscarthmornis* and later in *Idioptilon*, both of which are now defunct. Possibly a member of the superspecies formed by *H. mirandae*, *H. cinnamomeipectus* and *H. kaempferi*. Vocal and plumage differences across its range suggest that more than one species may be involved. Race *andinus* doubtfully distinct from *intensus*. Seven subspecies currently recognized.

Subspecies and Distribution.

H. g. lehmani (Meyer de Schauensee, 1945) - Sierra Nevada de Santa Marta, in N Colombia.
H. g. intensus (Phelps, Sr & Phelps, Jr, 1952) - NW Venezuela (Sierra de Perijá, SW Táchira).
H. g. federalis (Phelps, Sr & Phelps, Jr, 1950) - N Venezuela (Distrito Federal).
H. g. granadensis (Hartlaub, 1843) - Colombia (W & C Andes) and N Ecuador (W slope in Carchi, E slope S to W Napo).
H. g. andinus (Todd, 1952) - E Andes in W Venezuela (Páramo de Tamá, in Táchira) and Colombia (Norte de Santander and Santander).
H. g. pyrrhops (Cabanis, 1874) - SE Ecuador (E Loja) and Andes of Peru (Amazonas S to Cuzco).
H. g. caesius (Carriker, 1932) - SE Peru (Puno) and W & WC Bolivia (La Paz, Cochabamba).



Descriptive notes. 10·5 cm; 6·5-8·5 g. Nominate race has crown and upperparts dark olive, whitish loral and ocular area forming broad eyering and "spectacles"; wings dark olive, indistinct yellow edging on wing-coverts (but no discrete wingbars), bend of wing bright yellow; tail dark dusky olive; upper throat and lower cheek sooty black, lower throat whitish, laterally more grey; diffuse breastband greyish, fading to white below, tinged yellow on lower flanks and crissum; iris chestnut to pale orange, varying significantly among individuals; bill black; legs grey to pinkish-grey. Sexes alike. Juvenile has dark brown iris. Race *lehmani* has brighter, more yellowish-green, upperparts, buff lores and ocular area, brownish-black throat, brownish cast to breast, iris sometimes pale to whitish; *intensus* resembles previous, but has blacker throat with less brownish tinge, pure grey breast; *federalis* has whiter breast; *andinus* has lores buffy, breast less solidly grey; *pyrrhops* has ocular area deep cinnamon; *caesius* has eyering pale ashy grey or greyish-white, smaller loral patch and less black on central throat. Voice. Call (nominate race) a gravelly "dut't't, dut't't", a nasal "tip-buuuuu" and sharp "pik, peet, peet"; *pyrrhops* a fast, soft "whididik" and, when excited, a sharp, nasal, nagging "whip-wheép-wheép-wheép-wheép". Dawn song "kee kee kee krrrrrrrt", ending in hard, sharp trill. While patrolling gives short trill, "krrrt"; alarm call repeated "keep keep", like that of a *Synallaxis* spinetail like. Wing-whirring in flight.

Habitat. Humid, mossy montane forest, stunted upper cloudforest, shrubby second growth and shrubby cloudforest borders; 1800-3300 m, mostly 2000-3000 m.

Food and Feeding. Insects. Forages singly or in pairs, occasionally following mixed-species flocks, in lower and middle storey. Perches in relatively open surroundings within vegetation, making short, explosive upward strikes to glean prey from undersides of leaves.

Breeding. Birds with enlarged gonads in Mar-Jul in Colombia and Dec in Peru. Clutch 2 eggs. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Occurs in Tambito Nature Reserve, in Colombia, Podocarpus National Park, in Ecuador, and Río Abiseo National Park and Machu Picchu Historical Sanctuary, in Peru. Race *andinus* very poorly known, perhaps only definitely known from type locality in SE Peru (Puno), though possibly also occurs in Bolivia (La Paz).

Bibliography. Chapman (1917c), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Hennessey, Herzog & Sagot (2003), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1945, 1982), Meyer de Schauensee & Phelps (1978), Miller (1963), Parker *et al.* (1980), Phelps & Phelps (1950), Poulsen (1994), Remsen (1985), Remsen & Traylor (1983), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Todd (1952), Traylor (1977), Walker (2001), Zimmer (1940a).

161. **Buff-breasted Tody-tyrant**

Hemitriccus mirandae

French: Todirostre de Miranda **German**: Ockerbauch-Todityrann **Spanish**: Titirijí de Miranda

Taxonomy. *Todirostrum mirandae* E. Snethlage, 1925, São Paulo, Serra da Ibiapaba, north Ceará, Brazil.

Formerly treated in now defunct genus *Idioptilon*. Forms a superspecies with *H. cinnamomeipectus* and *H. kaempferi*, perhaps also including *H. granadensis* and *H. furcatus*. Monotypic.

Distribution. NE Brazil, on isolated ridges of N Ceará, Paraíba, Pernambuco, Alagoas and S Bahia.

Descriptive notes. 10 cm. Crown and upperparts are darkish olive, wings and tail dusky olive, broad creamy edge of innermost secondaries; lores, ocular area, cheek, throat and breast uniform pale creamy buff, belly more whitish, grading into pale yellow on crissum; iris orange; bill grey, lower mandible paler; legs grey to flesh-coloured. Sexes alike. Voice. Slow, slightly ascending (or, sometimes, descending) set of 6-7 notes, "kt-kit-kit-kiit-kiit-kiiit-kit", repeated in series; reminiscent of *H. orbitatus*. Sometimes audible wing-whirring in flight.

Habitat. Semi-humid highland forest and shrubby second-growth forest; found exclusively along slopes of isolated forested ridges at 600-1000 m.



Food and Feeding. Insects. Most often solitary. Forages in understorey and mid-levels of forest, especially in thick vine tangles, usually at 2-5 m; makes short upward strikes to glean prey from leaf undersides.

Breeding. No published information. Nest reported as pendent.

Movements. Resident.

Status and Conservation. VULNERABLE. Restricted-range species: present in Atlantic Slope of Alagoas and Pernambuco EBA. Uncommon and very local. Global population of a few thousand individuals; severely fragmented range of c. 1800 km², and habitat subjected to ongoing and rapid decline owing to massive deforestation. In 1991, was found at unprotected Fazenda Gameleira (Tianguá), on the Serra da Ibiapaba, and at Guaramirangá, in the 32,690-ha Serra do Baturité State Environmental Protection Area, both in Ceará; effectiveness of protection in latter area unclear, but local hotels protect some habitat. Found also at Areia, in Paraíba, and at several sites in Pernambuco state (may occur in the 350-ha Tapacurá Ecological Station). Recorded regularly in the 4500-ha Pedra Talhada Biological Reserve, which protects one of last remaining upland Atlantic Forest tracts in Alagoas; significant areas in Pedra Talhada are being reforested with native trees, and protection is enforced by guards and welcomed by the local community. Only 1% of original forest remains in Serra do Baturité, largely as a result of clearance for "sun" coffee since early 1970s, and the situation is similar or worse in Serra da Ibiapaba; remaining habitat threatened by fires and the construction of holiday homes. Only 2% of original cover is left in Alagoas and Pernambuco and 6% in Paraíba, with most forest replaced by sugar-cane plantations at low elevations and degraded by selective logging, firewood removal and small-scale cultivation at higher elevations. Although the species has been observed in secondary growth, it is confined to the best forest in Pedra Talhada. Only the protection of intact forest can secure the long-term survival of this tyrannid.

Bibliography. Bencke *et al.* (2001), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Cracraft (1985), Fitzpatrick & O'Neill (1979), Forrester (1993), Meyer de Schauensee (1982), Parker *et al.* (1996), Ridgely & Tudor (1994), Sick (1993, 1997), Silveira *et al.* (2003), Stattersfield & Capper (2000), Stotz *et al.* (1996), Teixeira *et al.* (1993), Traylor (1977), Wege & Long (1995).

162. **Cinnamon-breasted Tody-tyrant**

Hemitriccus cinnamomeipectus

French: Todirostre du Pérou **German**: Zimtbrust-Todityrann **Spanish**: Titirijí Pechicanelo
Other common names: Peruvian Tody-tyrant

Taxonomy. *Hemitriccus cinnamomeipectus* Fitzpatrick and O'Neill, 1979, Cordillera del Cóndor, above San José de Lourdes, Cajamarca, Peru.

Forms a superspecies with *H. mirandae* and *H. kaempferi*, perhaps also including *H. granadensis* and *H. furcatus*. Monotypic.

Distribution. SE Ecuador (near Chinapinza, in Zamora-Chinchipe) and N Peru (Cordillera del Cóndor, in Cajamarca; Cordillera de Colán, in Amazonas; Abra Patricia, in San Martín).



Descriptive notes. 10 cm; 6·5-8·5 g. Plumage is dark olive above, crown slightly browner and separated from mantle by a buff-orange nuchal collar; lores, ocular area, cheek, throat and breast bright cinnamon, darkest around eye, contrasting sharply with darker crown; wings and tail dusky, distinct broad pale yellowish edging on innermost secondaries; belly uniform pale yellow, well demarcated from cinnamon of breast; iris light reddish-brown; bill greyish, lower mandible pale flesh-coloured, sometimes tipped brown; legs greyish to pinkish-grey. Sexes alike. Juvenile has upperparts washed brownish with a few emerging olive feathers, throat and breast pale sandy, belly whitish to pale yellow, bill all black, legs darker. Voice. Fast harsh rattle, "d-d-d-rt"; also described as single descending "prrrrrrr".

Habitat. Thick, stunted, mossy cloudforest; also found in stands of *Chusquea* bamboo. Apparently limited to isolated ridges, at 1700-2200 m.

Food and Feeding. Insects. Forages in middle and lower storeys of wet forest, mostly 1·5-2 m above ground; makes short upward sally-strikes to vegetation to glean prey, usually returning to different perch. Sometimes follows mixed-species understorey flocks.

Breeding. Birds near end of breeding season (juvenile present, only some adults with active gonads, others moulting) in late Jun to late Aug in N Peru; singing male vigorously responding to song playback in mid-Sept in Ecuador. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Andean Ridge-top Forests EBA. Rare to uncommon; red-listed, as "Vulnerable", in Ecuador. Recorded from about five remote and isolated mountain ranges. In Ecuador, was found in the Cordillera del Cóndor in 1990 and in the Cutucú Mts; possibly threatened by heavy gold-mining activity in the region. In Peru, recorded in Cordillera del Cóndor in 1976 and Cordillera de Colán in 1978, but not in 1994, when almost all forest had been cleared for timber, pasture and cash crops (particularly marijuana and coffee); at the pass around Abra Patricia (in Amazonas and San Martín), was fairly common in 1976 and 1989 in cloudforest and elfin forest that were relatively inaccessible and untouched, and fairly common in 1999 in bamboo stands at slightly lower elevation; also recorded near La Peca Nueva in 1978. Given its very small range and continuing habitat degradation, the species may merit the conservation status of Vulnerable.

On following pages: 163. Kaempfer's Tody-tyrant (*Hemitriccus kaempferi*); 164. Buff-throated Tody-tyrant (*Hemitriccus rufigularis*); 165. Fork-tailed Pygmy-tyrant (*Hemitriccus furcatus*); 166. Black-chested Tyrant (*Taeniotriccus andrei*); 167. Rufous-crowned Tody-tyrant (*Poecilotriccus ruficeps*); 168. Johnson's Tody-tyrant (*Poecilotriccus luluae*); 169. White-cheeked Tody-tyrant (*Poecilotriccus albifacies*); 170. Black-and-white Tody-tyrant (*Poecilotriccus capitalis*); 171. Buff-cheeked Tody-flycatcher (*Poecilotriccus senex*); 172. Ruddy Tody-flycatcher (*Poecilotriccus russatus*); 173. Ochre-faced Tody-flycatcher (*Poecilotriccus plumbeiceps*); 174. Smoky-fronted Tody-flycatcher (*Poecilotriccus fumifrons*); 175. Rusty-fronted Tody-flycatcher (*Poecilotriccus latirostris*).

Bibliography. Begazo *et al.* (2001), Clements & Shany (2001), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Davies *et al.* (1994, 1997), Fitzpatrick & O'Neill (1979), Hornbuckle (1999), Krabbe & Sornoza (1994), Pacheco (2002c), Parker *et al.* (1996), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996), Wege & Long (1995).

163. **Kaempfer's Tody-tyrant**

Hemitriccus kaempferi

French: Todirostre de Kaempfer **German**: Ockerbrust-Todityrann **Spanish**: Titirijí de Kaempfer

Taxonomy. *Idioptilon mirandae kaempferi* J. T. Zimmer, 1953, Salto do Piraí, 450 feet [c. 140 m], Santa Catarina, Brazil.
Formerly treated in the now defunct genus *Idioptilon* and originally regarded as a race of *H. mirandae*. Forms a superspecies with latter and *H. kaempferi*, perhaps also including *H. granadensis* and *H. furcatus*. Curved outer rectrices and buffy head coloration suggest a relationship to last-mentioned. Monotypic.
Distribution. SE Paraná and NE Santa Catarina, in SE Brazil.



Descriptive notes. 10 cm. Similar to geographically remote *H. cinnamomeipectus*. Has crown buffy olive, lores, ocular area and cheek buffy; upperparts dark olive; wings dark olive, buffish-olive wingbars, distinct broad pale yellow edges on outer web of innermost secondaries; tail dusky olive, pale-tipped outer rectrices slightly elongated and curved outwards; throat and breast dull ochraceous buff, washed greenish-olive, belly uniform pale yellow and well demarcated from ochraceous of breast; iris brown to warm fawn-brown; bill grey, lower mandible lighter; legs dark grey. Sexes similar, female with outer rectrices perhaps less modified. Voice. A short series of high-pitched, nasal, raspy notes, "kuít-kuít" or "kwit-kwit", sometimes "kwit kwit-kwit kwit-kwit kwit-kwit", similar to voice of *H. orbitatus*. Sometimes wing-whirring in flight.
Habitat. Lowland tropical evergreen forest and shrubby second growth, favouring low, shaded growth with *Cecropia* and heliconias among thick ground flora, often in close proximity to rivers; sea-level to 150 m.
Food and Feeding. Insects; lepidopteran caterpillar observed to be taken. Forages alone or in pairs in dense vegetation, 0·5-3 m above ground; long pauses separated by short upward strikes or hover-gleans to take insects from underside of leaves.
Breeding. No information.
Movements. Resident.
Status and Conservation. ENDANGERED. Restricted-range species: present in Atlantic Forest Lowlands EBA. Apparently rare, and known from only three localities. Global population perhaps a few hundreds to a few thousands, and severely fragmented as a result of habitat loss due to deforestation, agricultural conversion, urbanization and associated road-building. First discovered in 1929, but not formally named until much later. Rediscovered very near type locality, at Salto do Piraí (NW of Vila Nova), in 1991, and several records since; 4 km² of intact forest adjacent to the site are now protected in the Bracinho Ecological Station, but the species has not been recorded within the reserve. A specimen was collected at Brusque in 1950; no subsequent records from the site, although suitable habitat remains. In 1998 and 2000, the species was also found in the 15-km² Patrimônio Natural de Volta Velha Special Reserve, near Itapoá, which protects one of the last remnants of mature primary lowland forest in Santa Catarina. Recently found at a fourth locality, called "APA Guaratuba", in SE Paraná. Less than 20% of original Atlantic Forest is intact, and lowland forest in vicinity of all sites continuing to be cleared. Both reserves should be expanded to include the type locality and adjacent suitable habitats. Protected by Brazilian law.
Bibliography. Anon. (2003e), Buzzetti *et al.* (2003), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Fitzpatrick (1976), Fitzpatrick & O'Neill (1979), Forrester (1993), Mazar Barnett *et al.* (2000), Meyer de Schauensee (1982), Mickleburgh & Fisher (2003), Naumburg (1939), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Teixeira *et al.* (1991), Wege & Long (1995).

164. **Buff-throated Tody-tyrant**

Hemitriccus rufigularis

French: Todirostre à gorge fauve **German**: Graukappen-Todityrann **Spanish**: Titirijí Gorgirrufo

Taxonomy. *Euscarthmus rufigularis* Cabanis, 1873, Monterico, Peru.
Formerly treated in genus *Euscarthmornis* and later in *Idioptilon*, both now defunct. Possibly allied to other brown-headed congeners, i.e. *H. granadensis*, *H. mirandae*, *H. cinnamomeipectus*, *H. kaempferi* and *H. furcatus*. Monotypic.
Distribution. Disjunctly along foothill ridges of E Andes in Ecuador (W Napo, Morona-Santiago, Zamora-Chinchipe), Peru (Loreto, San Martín, and from Huánuco S to N Puno) and N Bolivia (La Paz, extreme SW Beni, W Santa Cruz).



Descriptive notes. 12 cm; 7·8-9·5 g. Largest member of genus. Plumage is rather light olive above, crown greyer, supraloral spot, ocular area and cheek pale dull buff; wings and tail plain olive, indistinct paler olive edges of remiges and wing-coverts; throat buffy whitish, breast dull buff, both faintly streaked grey, belly whitish (Bolivian birds tend to be duller and more extensively streaked below); iris white to straw-yellow; bill grey, lower mandible greyish-flesh; legs greyish-pink or purple. Sexes alike. Voice. Vocalizes persistently throughout day, a nagging nasal "kik-keek-keek keek-kéék" or "kw-díp, kw-díp, kw-díp, kwe-deep" in series, usually 4-10 notes, later notes somewhat higher and louder; also simpler, less insistent, 2-note version of similar quality; voice resembles that of *H. granadensis*.
Habitat. Humid foothill forest on isolated low massifs; 800-1500 m.
Food and Feeding. Insects. Forages singly or in pairs; occasionally joins mixed-species flocks. Perches 2-8 m above ground, well below canopy, in continuous forest; makes short upward strikes to glean prey from undersides of leaves. Generally resides in small, persistent territory only 100-150 m in diameter.
Breeding. Oct-Dec in SE Peru. Nest an elongated structure woven from grass blades and weak twigs; rounded side entrance covered by short, downward-pointing awning; long, ragged bottom hanging below ball-shaped inner pocket; suspended 1 m above ground from outermost end of understorey twig, with hanging material almost reaching ground. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Rare to uncommon and very local. Recorded at only four sites in Ecuador, on S slope of Volcán Sumaco and along Loreto road, in Napo, in Codillera de Cutucú, in Morona-Santiago, and in Cordillera del Cóndor, in Zamora-Chinchipe; at a few scattered localities in Peru and W Bolivia. In Peru, much of this species' habitat is relatively intact above 900 m, but widespread destruction of foothill forests has taken place elsewhere in its range, where effects of extensive agricultural conversion and logging have been amplified by road-building and human colonization. Most of its range, however, is in remote areas.
Bibliography. Carrión & Sibley (1992), Clements & Shany (2001), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Davis (1986), Fitzpatrick (1976), Fitzpatrick & O'Neill (1979), Hennessey, Herzog & Sagot (2003), Hornbuckle (1999), Krabbe (1992), Meyer de Schauensee (1982), Parker *et al.* (1996), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg & Servat (2001), Schulenberg *et al.* (2001), Stattersfield & Capper (2000), Stotz *et al.* (1996), Traylor (1977), Zimmer (1940a).

165. **Fork-tailed Pygmy-tyrant**

Hemitriccus furcatus

French: Todirostre à queue fourchue **Spanish**: Titirijí Tijereta
German: Gabelschwanz-Todityrann
Other common names: Fork-tailed Tody-tyrant

Taxonomy. *T[odirostrum] furcatum* Lafresnaye, 1846, Rio de Janeiro, Brazil.
Formerly placed in a monotypic genus, *Ceratotriccus*, on basis of distinctive elongated and forked tail. Possibly a member of the superspecies formed by *H. mirandae*, *H. cinnamomeipectus* and *H. kaempferi*, possibly also including *H. granadensis*. Monotypic.
Distribution. CE & SE Brazil, in Bahia, S Minas Gerais, Rio de Janeiro and E São Paulo.



Descriptive notes. 11 cm. Has bright cinnamon-brown on forehead, becoming brownish-olive on nape and crown, face cocoa-brown to cinnamon, loral spot and eyering pale cinnamon-buff; upperparts bright olive; wings bright olive, distinct bright cinnamon edging on inner flight-feathers, broad creamy edge on outer web of innermost secondaries; tail distinctive, very long, outer rectrices longest and slightly curved inwards, mainly olive, with prominent white tips and black subterminal band; throat cocoa-brown, bordered below by clear white band or spot on centre of chest; breast and flanks pale greyish, slightly flammulated, belly more whitish; iris orange-brown; bill grey, lower mandible paler, pinkish to yellowish; legs grey to flesh-coloured. Sexes similar, tail slightly more prominently forked on male. Voice. High-pitched, fast, staccato "chídididik" or "kikky-tutu", in a series usually at intervals of 3-8 seconds.
Habitat. Humid forest and second growth along borders, especially in large-leaved bamboo thickets and viny tangles; to 1200 m. Original habitat may have been thickets growing along edges of natural landslides.
Food and Feeding. Insects. Usually solitary, only rarely joining mixed-species flocks. Makes short upward sally-strikes to glean insect prey, often from underside of bamboo leaves.
Breeding. Recently fledged juveniles in Nov in Bahia. No other information.
Movements. Resident.
Status and Conservation. ENDANGERED. Restricted-range species: present in Atlantic Forest Lowlands EBA. Generally judged to be rare to locally uncommon, though perhaps often overlooked. Estimated global population fewer than 10,000 individuals in a range of c. 3200 km². Recent records from only six localities, of which five in protected areas, i.e. Itatiaia National Park, Ubatuba Experimental Station, Serra do Mar State Park, Boracéia Biological Station, and Desengano State Park; last-mentioned is still threatened by deforestation. Discovered near Boa Nova, in Bahia, in 1993, thus extending its known range by c. 1000 km N. In the privately protected Fazenda Angelina, near Ubatuba, 1 pair/100 m, making it the commonest bird species in its particular habitat. Population severely fragmented by habitat loss due to deforestation, agricultural conversion, urbanization and associated road-building, leaving less than 20% of original forest cover intact. Smallholder farms are rapidly encroaching on remaining forests around Boa Nova. Protected by Brazilian law.
Bibliography. Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Cracraft (1985), Fitzpatrick (1976), Forrester (1993), Gonzaga *et al.* (1995), Meyer de Schauensee (1982), Pacheco & Whitney (1995), Ridgely & Tudor (1994), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Traylor (1977), Wege & Long (1995).

Genus *TAENIOTRICCUS*

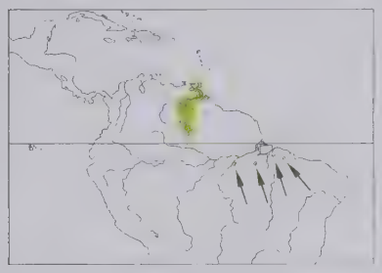
Berlepsch & Hartert, 1902

166. **Black-chested Tyrant**

Taeniotriccus andrei

French: Todirostre d'André **Spanish**: Mosquero Pechinegro
German: Schwarzschopf-Todityrann

Taxonomy. *Taeniotriccus andrei* Berlepsch and Hartert, 1902, La Prisión, River Caura, Bolívar, Venezuela.
Genus subsumed into *Poecilotriccus* by some authors, a move supported by additional research on internal morphology. Other authors have argued for retention of this monotypic genus on the basis of several distinctive morphological features, notably the crest, bill shape, wing and facial patterns, unusual comb-like feathers above the eyes, and the ruff-like feathering of the head and nape; this treatment is also supported by recent information on vocalizations. Validity of poorly known race *klagesi* has been questioned, but apparent large geographical separation from nominate, along with possible plumage distinctions, argue for maintaining it at any rate for the present. Two subspecies currently recognized.
Subspecies and Distribution.
T. a. andrei Berlepsch & Hartert, 1902 - NE & EC Venezuela in Monagas, Delta Amacuro and N Bolívar (mostly lower and middle R Caura and R Paragua), and extreme N Brazil (NE Amazonas, N Roraima).
T. a. klagesi Todd, 1925 - EC Brazil S of Amazon (S Pará, N Maranhão).



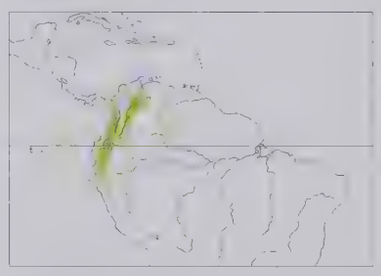
Descriptive notes. 12 cm; 8-9·6 g. Distinctive, with lax, ruff-like crest, modified bristly feathers projecting from above and in front of eyes. Male has forehead, chin, throat, side of face and nape rufous-chestnut; much of crown occupied by elongate black crest overlying and concealing rufous of nape (when crest held flat); upperparts and tail deep black; wings largely black, prominent pale yellow bases of outer webs of all remiges except outermost primaries and crossing to inner webs of tertials (especially extensively on longest), tertials furthermore with outer webs entirely pale yellow; breast covered by broad black band continuous with black of upperparts, belly abruptly pale grey, lightening posteriorly, and with greenish-yellow tinge on flanks and undertail-coverts; iris dark brown or reddish-brown; bill black, sometimes contrastingly pinkish basal portion of lower mandible; legs pale grey. Female differs from male in having black crest shorter, back brownish-olive, rufous of face and throat often duller, breast medal-bronze to olive-grey, belly more broadly whitish medially, flanks and undertail-coverts more strongly tinged olive, also tail dull blackish, outer margins of remiges noticeably brownish. Race *klagesi*, described on basis of a single female, is said to differ from nominate in more olive-grey breast and more whitish abdomen; field observations suggest that it also has more olive back and more contrastingly grey nape. Voice. Most commonly heard vocalization (particularly among spontaneously calling individuals) a reedy single-note "chewp" or "chert", repeated at regular intervals of c. 3-4 seconds for up to 5 minutes or more. Much less frequently heard is a pair of couplets, components of which are not distinctly disyllabic but sound more diphthongal, with first part of couplet sharper, second part clearer but with some of the reedy, wood-on-wood quality of the single-note call, could be transcribed as "k'dink k'dink"; these paired couplets rarely delivered consecutively in sequences but, rather, inserted into series of "chewp" calls, and given more frequently by individuals responding to tape playback (only occasionally by spontaneously vocalizing birds). Functional differences between the two types of vocalizations (i.e. song versus call) not obvious. Female occasionally gives single-note calls similar to those of male, but not heard to deliver the paired couplet.
Habitat. Understorey of humid tropical lowland evergreen forest and forest edge, particularly in seasonally flooded forest (*várzea*); present up to 350 m. Most Venezuelan records from swampy tidal forest dominated by mangrove and palms in Orinoco Delta; in Monagas, also in bamboo within *várzea* (where bamboo admixed with small, regenerating banana plantation). In Brazil, found in bamboo-dominated understorey in *terra firme* forest along R Xingu, and in rank understorey of *Cecropia*-dominated second growth near rivers; in Carajás region of Pará, occupies dense viny thickets and tangles in partially flooded *várzea* immediately adjacent to riverbanks, also "vine forest" many kilometres from major rivers and where forest somewhat swampy, with canopy broken and fairly low, with abundance of *Cecropia*, palms and small leguminous trees and shrubs, and with trees of family Lecythidaceae (mostly Brazil nut, *Bertholletia excelsa*) as the primary scattered emergents. In last-mentioned habitat, much of forest was in seemingly arrested state of perpetual second growth, perhaps partially maintained by lush blanket of vines overtopping most of the smaller trees.
Food and Feeding. Probably feeds on variety of insects and other small arthropods; only items identified in field observations were small orthopterans. All foraging data from Carajás region of Pará (Brazil). Forages singly or in pairs, separately from mixed-species flocks, 1-12 m (mostly 1-5 m) above ground, mostly in settings in which light penetration allows dense foliage and vine tangles to form fairly solid canopy that shades more open perches below. Usually perches on bare horizontal or diagonal branches or vines; typical posture three-quarters upright, with back slightly hunched and tail somewhat drooped; remains on single perch for period of 5 seconds to more than 1 minute, during which actively scans for prey, while often flicking both wings simultaneously, sometimes accompanied by shallow up-and-down twitch of tail. Most changes of perch accompanied by audible wing-whirr. Attack manoeuvres usually consist of diagonal and horizontal sally-gleans of 30 cm to 2·5 m, mostly to bare branches, stems or vines, but also to live foliage; sallies directed both upwards and downwards; in most instances the bird follows through to a new perch, but sometimes it will make looping sallies before returning to its original perch; most prey captures are accompanied by audible bill-snap. Smaller prey tends to be consumed immediately, whereas larger items are often bashed against branches prior to swallowing; one female was observed to hold a medium-sized arthropod in her bill and rub it vigorously through various feather groups before consuming it.
Breeding. Nothing known.
Movements. Presumed resident throughout range.
Status and Conservation. Not globally threatened. Poorly known; generally considered rare and patchily distributed throughout range, although it appears to be at least locally not uncommon, for instance in lowlands of Floresta Nacional de Carajás, in Pará (Brazil). Perhaps better treated as Data-deficient. It is likely that hitherto unidentified specific micro-habitat requirements restrict this species' presence to habitats that are themselves patchily distributed through EC Venezuela and Brazil. Most areas in which it has been found are under little current threat of development, and it seems to tolerate some second-growth and edge habitats. It occurs in e.g. Misión Araguaimujo (Delta Amacuro) and Caño Colorado (Monagas), both in Venezuela, and Tapajós National Park, Brazil.
Bibliography. Aleixo *et al.* (2000), Berlepsch & Hartert (1902), Cory & Hellmayr (1927), Donahue & Pierson (1982), Fitzpatrick (1976), Graves & Zusi (1990), Hilty (2003), Kirwan & Sharpe (1999), Lanyon (1988a), Meyer de Schauensee (1982), Novaes (1978b), Oren & Parker (1997), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Todd (1925), Traylor (1977), Zimmer & Whittaker (2004).

Genus *POECILOTRICCUS* Berlepsch, 1884

167. **Rufous-crowned Tody-tyrant**
Poecilotriccus ruficeps

French: Todirostre bariolé **German**: Rostkappen-Todityrann **Spanish**: Titirijí Capirrufo
Other common names: Rufous-crowned Tody-flycatcher

Taxonomy. *Tod[iramphus] ruficeps* Kaup, 1852, "? Mexico"; error, type presumably a "Bogotá" (Colombia) skin.
Formerly placed in genus *Todirostrum*. Forms a superspecies with *P. luluae*. Races appear to form two groups on plumage type, namely "bridled group" (*melanomystax*, *peruvianus*) and "plain-headed group" (nominate, *rufigenis*); two specimens from Boyacá may be hybrids (*melanomystax* x nominate), but otherwise lack of intergradation between the two groups, combined with notable plumage differences, suggests the groups may represent two separate species, although vocalizations similar; reproductive isolation of the two groups would help to explain curious leapfrog distribution of races; further study required, especially in areas of contact between subspecies groups, in particular S Ecuador and Boyacá; *P. luluae* probably represents a further, more definitively separated offshoot of the same lineage. Four subspecies currently recognized.
Subspecies and Distribution.
P. r. melanomystax Hellmayr, 1927 - Andes in W Venezuela (N Mérida, E Trujillo) and C Colombia (Antioquia S to Cauca and head of Magdalena Valley, also Boyacá).
P. r. ruficeps (Kaup, 1852) - extreme SW Venezuela (S Táchira), and NE (Norte de Santander) & SW Colombia S to SC Ecuador.
P. r. rufigenis (P. L. Sclater & Salvin, 1877) - SW Colombia (Nariño) and NW Ecuador.
P. r. peruvianus Chapman, 1924 - S Ecuador (Loja, Zamora-Chinchipe) and N Peru (Piura, Cajamarca).



Descriptive notes. 9-10·2 cm; 6·6 g. Nominate race has distinctive bright rufous crown and grey nape separated by black line which connects with thin black malar stripe; white to buffy supraloral area and and cheek separated by thin black eyestripe; olive upperparts; black wings, two fairly narrow yellow wingbars, yellowish-white edges of remiges and tertials; olive-brown tail; throat and upper breast buffy whitish, diffuse dusky breastband, remaining underparts bright yellow; iris dark brown; bill black; legs grey. Sexes alike. Juvenile has paler throat than adult. Race *rufigenis* has malar streak indistinct or lacking; *peruvianus* has more pronounced black facial markings; *melanomystax* has whitish cheeks. Voice. Call low-pitched flat "chak", "tttrew", "patreer-pít" or "pip-prrrrrr", last note sometimes omitted; "tick-trrrrt" during foraging. Song usually a series of sputters, e.g. "pa-treer-pit-pit-pit", that of *melanomystax* described as gravelly "stick-di-dik".
Habitat. Thickets, bamboo, shrubs and small saplings at forest edges, in second growth, hedgerows, overgrown pastures and clearings; not found inside closed forest. Usually 1600-2700 m, sometimes down to 1000 m and up to 2900 m.
Food and Feeding. Insectivore. Feeds alone, in pairs or in family groups, rarely in mixed-species flocks. Uses short forward or upward sallies to catch insects in dense vegetation close to ground.
Breeding. Birds with enlarged gonads in Mar-Sept. No other relevant information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common or common. Locally common in Colombia; locally fairly common in NW Ecuador. Occurs in Guaramacal National Park, in Venezuela, and almost all Andean national parks in Ecuador. Probably declining because of habitat loss.
Bibliography. Allen (1998), Chapman (1917c), Cuervo & Delgado (2001), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Johnson (2002), Meyer de Schauensee (1982), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Schönwetter & Meise (1968), Stotz *et al.* (1996), Zimmer (1940a).

168. **Johnson's Tody-tyrant**
Poecilotriccus luluae

French: Todirostre de Lulu **German**: Lulutodityrann **Spanish**: Titirijí de Lulu
Other common names: Lulu's/Lulu von Hagen's Tody-tyrant

Taxonomy. *Poecilotriccus luluae* Johnson and Jones, 2001, 5 km SE of Corosha, Amazonas, Peru.
Forms a superspecies with *P. ruficeps*. Monotypic.
Distribution. Amazonas and San Martín (Cordillera de Colán and nearby mountains to E), in N Peru.



Descriptive notes. 10 cm; 7·3-7·6 g. Has distinctive bright rufous head, white chin, grey lower nape; olive upperparts, black wings, two narrow yellow wingbars, yellow-white edges of remiges and tertials, olive-brown tail; rufous throat, white band on lower throat; orange-yellow underparts, olive streaking on upper breast and flanks; iris brown; bill black; legs greyish. Sexes alike. Voice. Call a sharp piercing "chick", uttered by both sexes; song, by male only, a short harsh trill, "prrrrt", usually preceded by the "chick" call.
Habitat. Bamboo thickets and edge; also inside forest, usually near bamboo, e.g. in undergrowth of residual subtropical forest or ground strata in cloudforest. Also found in tall or shrubby second growth, e.g. along roads. At 1800-2550 m.
Food and Feeding. Insectivore; hymenopterans recorded in diet. Usually forages in pairs, below 10 m from ground; makes short upward sally-gleans, aerial sallies and perch-gleans.

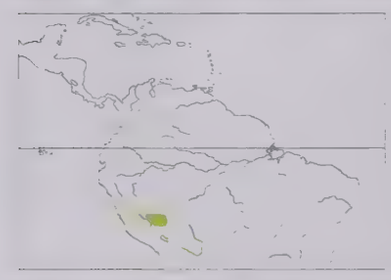
Breeding. Carrying nest material in Dec. No other information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Rare; probably merits listing as threatened species. Restricted to small area of N Peru. Known from only seven localities in Cordillera de Colán, in N extension of Cordillera Central, in nearby mountains known as "Afluente-Abra Patricia" (all in Amazonas), and also from one specimen record 250 km farther S, in Río Abiseo National Park (San Martín). Fairly common 30 km E of Florida de Pomachochas (on road to Rioja, in Amazonas), and E of Abra Patricia (where 1820 km² of forest recently afforded protection). Vulnerable because of its small range, c. 360 km², and estimated population of fewer than 10,000 individuals; probably declining owing to rapid habitat loss caused by logging and conversion to agriculture, although this species may benefit from the overgrowing of abandoned pastures and from the promotion of secondary growth by habitat degradation.
Bibliography. del Carmen & Fjeldså (1999), Clements & Shany (2001), Davis (1986), Etherington (2001), Green (2002c), Hornbuckle (1999), Johnson (2002), Johnson & Jones (2001).

169. White-cheeked Tody-tyrant

Poecilotriccus albifacies

French: Todirostre à face blanche **Spanish**: Titirijí Cariblanco
German: Weißwangen-Todityrann
Other common names: White-cheeked Tody-flycatcher, White-chested Tody-tyrant

Taxonomy. *Todirostrum albifacies* Blake, 1959, left bank of Boca de Río Colorado, Madre de Dios, Peru.
Formerly placed in genus *Todirostrum*. Sometimes considered conspecific with *P. capitalis*. Monotypic.
Distribution. S Madre de Dios and NE Cuzco, in SE Peru.



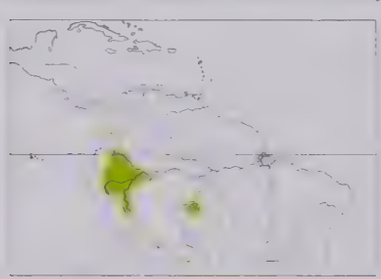
Descriptive notes. 9·5 cm; 8 g. Male has distinctive rufous crown, white side of head, black nuchal collar extending forwards in two thin black stripes pointing towards eye and malar area; upperparts olive, wings and tail black, white edges of tertials; throat and underparts white, except for black breast side, faintly streaked; iris brown; upper mandible black, lower mandible orange-yellow; legs grey. Female is duller than male, with dark grey neck and cheeks, broad olive wing edgings. Voice. Call, by both sexes, a fast series of sharp "pik" notes, often accelerating, e.g. "pic-picpic-picpicpic".
Habitat. Closely associated with dense *Guadua* bamboo thickets in humid and mainly transitional tropical lowland forest; to 1050 m.
Food and Feeding. Insectivore. Usually forages in pairs, 2-9 m above ground in bamboo thickets, occasionally in adjacent forest; uses upward and forward sally-gleans and perch-gleans to catch insects on bamboo foliage and branches.
Breeding. No information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in South-east Peruvian Lowlands EBA. Uncommon and very local. Occurs above Amazonia Lodge (Cuzco), in Manu National Park and in Tambopata-Candamo Reserved Zone. SE Peruvian lowland forests remain relatively intact, but mining, oil/gas extraction and other development schemes, coupled with associated road-building, human intrusion and selective logging, pose serious future threats; the integrity even of large protected areas, as at Manu and Tambopata-Candamo, is not assured.
Bibliography. Allen (1995), Angehr & Aucca (1997), Clements & Shany (2001), Collar *et al.* (1994), Cracraft (1985), Karr *et al.* (1990), Kratter (1997), Meyer de Schauensee (1982), Parker (1982b), Parker *et al.* (1997), Ridgely & Tudor (1994), Stattersfield *et al.* (1998), Stotz *et al.* (1996).

170. Black-and-white Tody-tyrant

Poecilotriccus capitalis

French: Todirostre noir et blanc **German**: Schwarzweiß-Todityrann **Spanish**: Titirijí Pío
Other common names: Black-and-white Tody-flycatcher; Tricoloured Tody-tyrant ("*P. tricolor*")

Taxonomy. *Todirostrum capitale* P. L. Sclater, 1857, River Napo, eastern Ecuador.
Formerly placed in genus *Todirostrum*. Sometimes considered conspecific with *P. albifacies*. Described taxon *P. tricolor*, from SW Brazil (Rondônia), has recently been subsumed into present species. Monotypic.
Distribution. S Colombia (SE Nariño, SW Putumayo), E Ecuador, E Peru and SW Brazil (Rondônia).



Descriptive notes. 9·4-9·6 cm; 5·6-8 g. Male has distinctive glossy black upperparts, except for small white supraloral spot and eyering, broad pale yellow edges of tertials, occasionally pale outer web of outermost primary ("*tricolor*"); entirely white below, except for black intruding on upper side of throat and upper breast side (sometimes forming partial pectoral band), pale yellow tinge on flanks and crissum; iris reddish-brown; upper mandible black, lower mandible pale orange-yellow; legs grey. Female has distinctive chestnut cap, buffy lores and eyering, olive upperparts, blackish tail and wings, olive-edged flight-feathers, broad pale yellow tertial edges, grey on side of head and upper breast side, remaining underparts white except for pale yellow flanks and crissum, legs yellow-olive. Voice. Call a fast sharp "tik, t-r-r-r-r-r-r-ew", when agitated more explosive "tk, tk, tk, whey-whey-whey-whuh".
Habitat. Bamboo and tangled viny thickets along streams, roads, and edges of humid lowland and foothill forest; also found in dense undergrowth of second growth without bamboo. Recorded up to 1350 m.
Food and Feeding. Insectivore. Feeds alone or in pairs, independent of mixed flocks, in dense vegetation close to ground; uses short forward or upward sally-gleans.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Generally considered rare to uncommon and local; perhaps often overlooked. More common around Kapawi Lodge (Pastaza) and Tiputini Biodiversity Center in Yasuní National Park (Napo), both in Ecuador. Status in SW Brazil requires investigation.
Bibliography. Cardiff (1983), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Forrester (1993), Hilty & Brown (1986), Hornbuckle (1999), Meyer de Schauensee (1982), Parker & Parker (1982), Parker *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (1984), Sick (1993, 1997), Stotz *et al.* (1996), Zimmer (1940a).

171. Buff-cheeked Tody-flycatcher

Poecilotriccus senex

French: Todirostre à joues rousses **Spanish**: Titirijí Carirrosa
German: Ockerwangen-Todityrann
Other common names: Buff-cheeked Tody-tyrant, Plumbeous-crowned/Borba Tody-flycatcher, Todybill

Taxonomy. *Euscarthmus senex* Pelzeln, 1868, Borba, River Madeira, Amazonas, Brazil.
Formerly placed in genus *Todirostrum*. Monotypic.
Distribution. Borba region of lower R Madeira (E Amazonas), in NC Brazil.



Descriptive notes. 9 cm. Male has slate-grey forehead and forecrown with black spots, dark olive hindcrown with feathers slightly elongated into a rather weak crest; light pinkish-cinnamon loral and facial areas; bright olive upperparts, blackish tail and wings, two conspicuous yellowish-white wingbars, pale edges of flight-feathers; white below, narrow dark streaks on throat, streaks becoming olivaceous and somewhat blurry through breast and upper belly, belly pale yellow; bare parts dark. Female not described. Voice. No information available.
Habitat. Humid forest. Most common in thick, low-stature forest growing at edge of black-water rivers; also present in some physiognomically similar patches of white-sand woodland.
Food and Feeding. Forages mostly in upper third of vegetation, regardless of vegetation height. No other information.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Until recently known only from type specimen, collected in 1830 at Borba, on E bank of lower R Madeira. Rediscovered at this site in Oct 1993, and found to be fairly common. Deforestation in Amazonas remains slight; nevertheless, because the area around Borba still supports extensive tracts of intact Amazonian forest and savannas, protection of these is a high priority.
Bibliography. Collar *et al.* (1992), Cory & Hellmayr (1927), Cracraft (1985), Forrester (1993), Hellmayr (1910), Pelzeln (1868-1871), Ridgely & Tudor (1994), Sick (1993, 1997), Stattersfield *et al.* (1998), Stotz *et al.* (1996), Wege & Long (1995), Whitney & Cohn-Haft (2004).

172. Ruddy Tody-flycatcher

Poecilotriccus russatus

French: Todirostre roussâtre **German**: Rostgesicht-Todityrann **Spanish**: Titirijí Bermejo
Other common names: Russet Tody-flycatcher

Taxonomy. *Euscarthmus russatus* Salvin and Godman, 1884, Mount Roraima, 6000 feet [c. 1830 m], Venezuela.
Formerly placed in genus *Todirostrum*. Forms a superspecies with *P. plumbeiceps*. Monotypic.
Distribution. Tepuis of SE Venezuela (SE Bolívar) and adjacent areas in Guyana and Brazil.



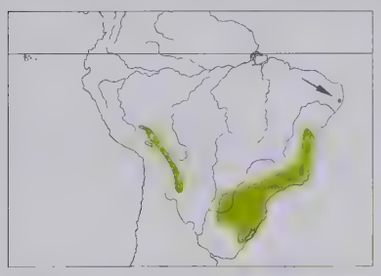
Descriptive notes. 9·5-10·2 cm; 6·5-8·3 g. Male has cinnamon-rufous forehead, sooty-black crown; otherwise dark olive above, two cinnamon-rufous wingbars, greenish-yellow edges of inner remiges; side of head cinnamon-rufous, throat and breast slightly paler, remaining underparts greyish, flanks tinged brownish; iris dark; bill and legs grey to blackish. Female differs from male in having greyer crown. Voice. Call a weak dull "tsuk, sick, tr'r'r'r'r'r'r'r'r'r", sometimes followed by 2-3 shorter trills, or elements given separately, or "tik-a-doo"; other variations when agitated, e.g. "chip-t'b'r'r'r'r, squeeeeo, t'b'r'r'r'r".
Habitat. Dense thickets at edge of humid and wet mossy forest and undergrowth of older second growth, often near streams; also edges of stunted, dense woodland dominated by melastomes (Melastomataceae). At 1200-2500 m.
Food and Feeding. Insectivore. Feeds mostly in pairs, usually not with mixed flocks; makes short forward and upward sallies to catch insects in dense vegetation close to ground.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tepuis EBA. Uncommon to common. In Venezuela, fairly common at edge of stunted woodland on Sierra de Lema and occurs also in Canaima National Park; in Guyana, fairly common in forest undergrowth from 1200 m upwards on Mt Roraima and present also on Mt Ayanganna. Tepuis within this species' range are rather unaffected by human disturbance owing to their inaccessibility, but vegetation on the tepuis is especially sensitive to fire and other disturbances; gold-prospectors and uncontrolled tourism have recently had severe adverse impacts locally.
Bibliography. Braun *et al.* (2003), Chapman (1931), Cory & Hellmayr (1927), Cracraft (1985), Forrester (1993), Gilliard (1941), Hilty (2003), Mayr & Phelps (1967), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Sick (1993, 1997), Stattersfield *et al.* (1998), Stotz *et al.* (1996).

173. Ochre-faced Tody-flycatcher

Poecilotriccus plumbeiceps

French: Todirostre gorgeret **German**: Ockergesicht-Todityrann **Spanish**: Titirijí Cabecicanela

Taxonomy. *T[odirostrum] plumbeiceps* Lafresnaye, 1846, "Brésil, Bolivie" = Paraguay.
Formerly placed in genus *Todirostrum*. Forms a superspecies with *P. russatus*. Four subspecies recognized.
Subspecies and Distribution.
P. p. obscurum (J. T. Zimmer, 1940) - SE Peru (from Cuzco) S to E Bolivia (Santa Cruz).
P. p. viridiceps (Salvadori, 1897) - S Bolivia (from Chuquisaca) S to N Argentina (Salta).
P. p. cinereipectus (Novaes, 1953) - NE & CE Brazil (Alagoas, Bahia, SE Minas Gerais, Espírito Santo).
P. p. plumbeiceps (Lafresnaye, 1846) - E Paraguay, SE Brazil (Rio de Janeiro and São Paulo S to Rio Grande do Sul), NE Argentina (Misiones, Corrientes) and NE Uruguay.



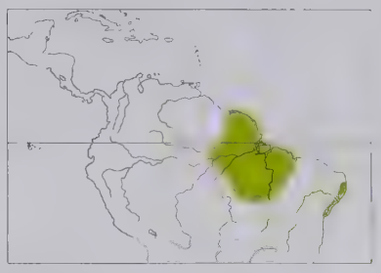
Descriptive notes. 9-9·5 cm; 5·3-6 g. Has buffish-cinnamon forehead, grey crown; otherwise dark olive above, dusky wings with two ochraceous wingbars, ochraceous-edged flight-feathers; side of head buffy cinnamon with dusky auriculars, throat slightly paler, underparts greyish-white; iris brown; bill and legs dark greyish. Sexes alike. Race *viridiceps* has olive tinge on crown, more grey on breast; *obscurum* resembles previous but somewhat darker; *cinereipectus* has more extensive grey on breast. Voice. Call a series of up to five low, sharp "drrr" churrs or rattled "tr-r-r-r-r" trills, sometimes preceded by "tik" note.
Habitat. Dense vine tangles, shrubs, *Chusquea* bamboo or bracken (*Pteridium aquilinum*) thickets at edges of humid forest, and dense undergrowth of second growth. At 750-2750 m.
Food and Feeding. Insectivore. Forages alone or in pairs, usually not with mixed flocks; uses short sallies to catch insects close to ground.
Breeding. Nests in Nov in Argentina and Jan in Paraguay; juveniles observed in Mar. Nest an untidy elongated pear-shaped structure c. 20 cm high and c. 10 cm wide, "visor-shaded" side entrance 3 cm wide, built of dry fibres, including strips of grass and cane leaves, with rounded inner chamber 7·8 × 4·3 cm, sometimes dangling tail 20-30 cm long, suspended usually 1·4-2 m above ground from tip of slender branch in shaded space. Clutch 2-3 eggs; no information on incubation and fledging periods. Brood parasitism by Pavonine Cuckoo (*Dromococcyx pavoninus*) recorded.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Fairly common. Occurs in a number of protected areas, including Pilón Lajas Biosphere Reserve and Madidi National Park, in Bolivia, Caaguazú, San Rafael and Ybycuí National Parks, in Paraguay, Augusto Ruschi Biological Reserve, Fazenda Limoeiro (Minas Gerais), Mata dos Godoy State Park (Paraná), Patrimônio Natural do Caraça Special Reserve and Iguaçu and Itatiaia National Parks, all in Brazil, and Calilegua National Park, in Argentina.
Bibliography. Brooks *et al.* (1993), Canevari *et al.* (1991), Cory & Hellmayr (1927), Cracraft (1985), Darrieu (1987), Di Giacomo & López (1998), Fjeldså (1990), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Hayes (1995), Lowen *et al.* (1996), Meyer de Schauensee (1982), Miserendino (1998), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Pacheco & Whitney (1995), de la Peña (1988), Ridgely & Tudor (1994), Roberson (1996), do Rosário (1996), Sick (1993, 1997), Stotz *et al.* (1996), Teixeira *et al.* (1989), Zimmer (1940a).

174. Smoky-fronted Tody-flycatcher

Poecilotriccus fumifrons

French: Todirostre à front gris **German**: Graustirn-Todityrann **Spanish**: Titirijí Frentigrís

Taxonomy. *Todirostrum fumifrons* Hartlaub, 1853, Bahia, Brazil.
Formerly placed in genus *Todirostrum*. Forms a superspecies with *P. latirostris*. Two subspecies recognized.
Subspecies and Distribution.
P. f. penardi (Hellmayr, 1905) - Surinam and French Guiana.
P. f. fumifrons (Hartlaub, 1853) - lower Amazonian & NE Brazil (C Pará E to S Maranhão and NE Mato Grosso, and coastal region from Paraíba S to N Bahia).
Descriptive notes. 9 cm; 6·7·2 g. Has smoky-grey forehead, olive crown, dull buffish-white supraloral and ocular region; olive upperparts, blackish tail and wings, two prominent buff-yellowish wingbars, yellowish edgings of remiges; whitish throat merging into pale yellow belly, breast with obscure streaks, sides tinged olive; iris light red-brown; bill black, very small white tip; legs plumbeous. Sexes alike. Race *penardi* is very like nominate. Voice. Almost toneless low rattling "kerrr" trill, repeated 5-6 times in quick succession if agitated, usually preceded by one to several "tic" notes.



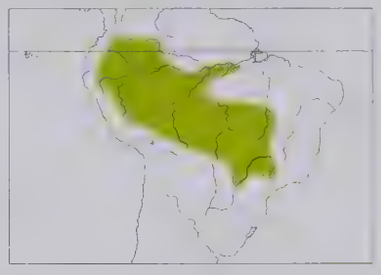
Habitat. Dense shrubs and thickets in forest edge and overgrown pastures and clearings, also low bushes in open savanna but close to forest edge; to 400 m.
Food and Feeding. Insectivore; recorded prey include coleopterans (Halticinae), hymenopterans, dipterans. Usually forages in pairs, using short sallies to catch insects.
Breeding. No information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Rare to uncommon. In Surinam, fairly common along airstrip at Raleigh Falls Nature Park and occurs also in Sipaliwini Savanna Nature Reserve. Present also in EMBRAPA Experimental Station and Pedra Branca/Fazenda Bananeira Reserve (Alagoas), in Brazil.
Bibliography. Cory & Hellmayr (1927), Forrester (1993), Haverschmidt (1968), Haverschmidt & Mees (1994), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Sick (1993, 1997), Schönwetter & Meise (1968), Stotz *et al.* (1996), Tostain *et al.* (1992).

175. Rusty-fronted Tody-flycatcher

Poecilotriccus latirostris

French: Todirostre à front roux **German**: Rostzügel-Todityrann **Spanish**: Titirijí Frentirrojo

Taxonomy. *Euscarthmus latirostris* Pelzeln, 1868, Borba, River Madeira, Amazonas, Brazil.
Formerly placed in genus *Todirostrum*. Forms a superspecies with *P. fumifrons*. Seven subspecies recognized.
Subspecies and Distribution.
P. l. mituense (Olivares, 1965) - E Colombia (around Mitú, Vaupés).
P. l. caniceps (Chapman, 1924) - S Colombia (W Caquetá) E to NW Brazil (E to Tefé) and S to E Ecuador and E Peru.
P. l. senectus (Griscom & Greenway, 1937) - N Brazil N of Amazon (NE Amazonas E to NW Pará).
P. l. latirostris (Pelzeln, 1868) - C Amazonian Brazil from upper R Juruá and R Purús E to Parintins.
P. l. austroriparius (Todd, 1952) - right bank of R Tapajós, in W Pará (Brazil).
P. l. mixtus (J. T. Zimmer, 1940) - SE Peru (from N Puno) S to NW Bolivia (La Paz, Beni, Cochabamba).
P. l. ochropterus (J. A. Allen, 1889) - S Brazil (Mato Grosso S to N São Paulo).



Descriptive notes. 9·4-9·5 cm; 8·1-9 g. Nominate race has rusty-buff forehead and side of head, brownish-grey crown and neck, olive upperparts, dusky tail and wings, two ochraceous wingbars, yellowish-edged flight-feathers and bend of wing; greyish-white below, tinged olive on breast and sides; iris dark; bill and legs greyish. Sexes alike. Race *caniceps* has darker grey crown, richer buffy facial area; *ochropterus* has pale brownish crown, golden tinge to upperparts; other races all fairly similar to nominate. Voice. Frog-like call a short, dry, low-pitched rattled trill, "tik, trrrr, trrrr", sometimes just the "tik" note.
Habitat. Dense thickets and overgrown shrubby tangles in undergrowth of young secondary growth, overgrown pastures and clearings, and along humid forest edge and riverbanks; also on lowland river islands. To 1100 m.
Food and Feeding. Insectivore. Usually forages in pairs, not accompanying mixed flocks; uses short forward and upward sallies to catch insects in dense vegetation close to ground.
Breeding. Birds in breeding condition recorded in Jun. No other information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to locally common. Common around Leticia, in extreme SE Colombia. Occurs in numerous national parks and other protected areas throughout its range, within which much of its habitat remains in relatively pristine condition.
Bibliography. Allen (1995), Bates & Parker (1998), Cory & Hellmayr (1927), Dubs (1992), Gyldenstolpe (1950), Hennessey, Herzog & Sagot (2003), Hilty & Brown (1986), Karr *et al.* (1990), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Schulenberg *et al.* (2001), Sick (1993, 1997), Stotz *et al.* (1996), Willis & Oniki (1990), Zimmer (1930, 1940a).



176. **Slate-headed Tody-flycatcher**

Poecilotriccus sylvia

French: Todirostre de Desmarest **German**: Graukopf-Todityrann **Spanish**: Titirijí Gris
Other common names: Slaty Tody-flycatcher

Taxonomy. *Todus sylvia* Desmarest, 1806, locality unknown = probably French Guiana. Formerly placed in genus *Todirostrum*. Five subspecies recognized.

Subspecies and Distribution.

P. s. schistaceiceps (P. L. Sclater, 1859) - S Mexico (from S Veracruz) S to Panama (E to Canal Zone).

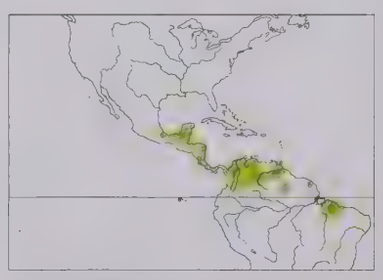
P. s. superciliaris (Lawrence, 1871) - N, W & C Colombia (Caribbean coast, Magdalena and Cauca Valleys, in middle Dagua Valley on Pacific Andean slope, and S to W Meta on E slope).

P. s. griseolus (Todd, 1913) - N & C Venezuela and extreme E Colombia.

P. s. sylvia (Desmarest, 1806) - extreme N Brazil (along R Branco), Guyana and French Guiana.

P. s. schulzi (Berlepsch, 1907) - NE Brazil (SE Pará E to Piauí).

Descriptive notes. c. 9-10 cm; 6·7-8·5 g. Nominate race has grey crown and nape, white "spectacles" formed by white supraloral line and eyering, latter broken at front by grey lores; olive



upperparts, blackish wings, two bold yellow wingbars, yellowish-edged inner flight-feathers; greyish-white below, streaked greyish on lower throat and breast, flanks tinged olive; iris dark brown, sometimes pale yellow, grey or white; bill black; legs light bluish-grey. Sexes alike. Juvenile has olive crown and nape not distinctly different from back, buffy-tinged wingbars, paler and greyer underparts without streaking. Races vary little: *schulzi* is darker than nominate, has much greyer breast, and more ochraceous wingbars; *schistaceiceps* has pale yellow sides, flanks and crissum, reddish-brown, tawny, purplish or pale yellow iris; *superciliaris* and *griseolus* resemble nominate but both tend to be somewhat darker overall. Voice. Call is a soft, low, gravelly "tic" or "trup", sometimes repeated; a nasal descending "trrrr" trill sometimes added, and trill also given alone at times, sounding very insect-like or frog-like; also utters an excited "tíc-a-turr".

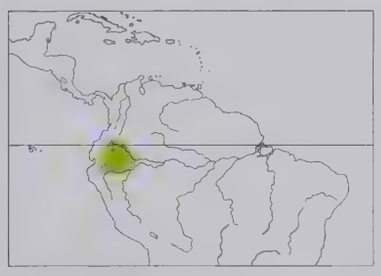
Habitat. Dense thickets along forest edges and overgrown shrubby roadsides, and shrubby and vine-tangled young second growth in overgrown pastures and clearings; also understorey of gallery forest and dry woodlots. Lowlands to 1100 m.
Food and Feeding. Mainly arthropods; fruit also taken. Recorded foods ants and small wasps (Hymenoptera), homopteran (e.g. leafhoppers) and heteropteran bugs, beetles (Coleoptera), flies (Diptera), orthopterans, lepidopterans, spiders (Araneae). Usually forages in pairs; uses short forward and upward sallies to catch prey in dense vegetation close to ground, sometimes also high in canopy.
Breeding. Nests found in Mar in Costa Rica and Jun in Venezuela; eggs in Apr-Jun and birds in breeding condition in Jan-Aug. Elongated nest with side entrance, built of moss, grasses, plant epidermis and fibres, suspended usually below 3 m from tip of slender branch in free space covered above by thick foliage in thicket. Clutch 2 eggs; no information on incubation period; nestling period c. 18-21 days.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to locally common; perhaps often overlooked. Fairly common in Tocumen area of Panama. Occurs in many national parks and other protected areas throughout its range. Tolerant of converted habitat; probably benefits from deforestation if forest subsequently allowed to regenerate.
Bibliography. Anon. (1998a), Binford (1989), Cory & Hellmayr (1927), Cracraft (1985), Haffer (1975), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Karr (1971), Lee Jones (2004), Miller (1947), Monroe (1968), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Schönwetter & Meise (1968), Sherry (1983b, 1984), Sick (1993, 1997), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Thomas (1982), Tostain *et al.* (1992), Wetmore (1972).

177. **Golden-winged Tody-flycatcher**

Poecilotriccus calopterus

French: Todirostre à ailes d'or **German**: Goldflügel-Todityrann **Spanish**: Titirijí Alidorado

Taxonomy. *Todirostrum calopterum* P. L. Sclater, 1857, River Napo, Ecuador.
Formerly placed in genus *Todirostrum*. Forms a superspecies with *P. pulchellus*, and often considered conspecific. Monotypic.
Distribution. S Colombia (SE Nariño, W Putumayo), E Ecuador and NE Peru (Loreto).



Descriptive notes. 8·9-9·7 cm; 5·9-8·7 g. Has black head, olive upperparts, black wings, distinctive pattern of chestnut shoulder patch bordered by wide golden-yellow wingband, and yellow-edged tertials; tail black; white throat contrasting with bright yellow underparts; iris dark brown; bill black; legs grey. Sexes alike. Juvenile undescribed. Voice. Mechanical, gravelly, rapid and descending "tsk-t-t-t-t-t-t", "dre'd'd'd'deu" or "p-drrrew", repeated every 5-10 seconds, sometimes given as duet.
Habitat. Undergrowth of humid lowland forest and foothill forest and edge, and overgrown dense bushy second growth in abandoned pastures and clearings; recorded up to 1450 m.
Food and Feeding. Insects recorded. Usually forages in pairs, and not joining mixed flocks; uses short forward and upward sallies to catch insects in dense vegetation close to ground.
Breeding. No information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Upper Amazon-Napo Lowlands EBA. Rare to locally fairly common. Fairly common at Jatun Sacha Biological Station, and occurs also at Kapawi and La Selva Lodges and Archidona Natural Reserve, all in Ecuador. Although forests in its range are reasonably intact, deforestation in E Ecuador and parts of SE Colombia has been quite extensive, with further threats emerging from new oil fields and associated road-building and human intrusion.
Bibliography. Cardiff (1983), Cracraft (1985), Curson & Lowen (2000), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stattersfield *et al.* (1998), Stotz *et al.* (1996).

178. **Black-backed Tody-flycatcher**

Poecilotriccus pulchellus

French: Todirostre à dos noir **German**: Weißzügel-Todityrann **Spanish**: Titirijí Dorsinegro

Taxonomy. *Todirostrum pulchellum* P. L. Sclater, 1874, Peruvia alta, Cosñipata, Cuzco, Peru.
Formerly placed in genus *Todirostrum*. Forms a superspecies with *P. calopterus*, and often considered conspecific. Monotypic.
Distribution. SE Peru (E Cuzco, N Puno).



Descriptive notes. 9-9·5 cm; 7·2-8·7 g. Male has black head and upperparts, with very small white spot or spots behind eye, and short white submoustachial stripe; black wings,with distinctive pattern of dull chestnut shoulder patch bordered by wide golden-yellow wingband, and yellow-edged tertials; tail black, with pale yellow outer web on outer pair of feathers; throat white, rest of underparts bright yellow; iris usually dark; bill black; legs grey. Female differs from male in having white loral spot and dark olive back. Juvenile not described. Voice. Rapid mechanical notes, similar to those of *P. calopterus*.
Habitat. Inhabits dense low shrubby areas along edges of humid lowland and foothill forest, at elevations of 300-1100 m.
Food and Feeding. Insects recorded. Usually forages in pairs, not joining mixed flocks; uses short forward and upward sallies to catch prey in dense vegetation close to ground.
Breeding. No information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Southeast Peruvian Lowlands EBA. Rare to uncommon. Uncommon along lower Manu road, lower Shintuya-Paucartambo road, and at Amazonia Lodge. SE Peruvian lowland forests remain relatively intact, but mining, oil extraction and other development schemes, with associated road-building and human intrusion, pose serious future threats; integrity even of large protected areas, such as Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, is not assured.
Bibliography. Clements & Shany (2001), Cracraft (1985), Ridgely & Tudor (1994), Stattersfield *et al.* (1998), Stotz *et al.* (1996), Zimmer (1940a).

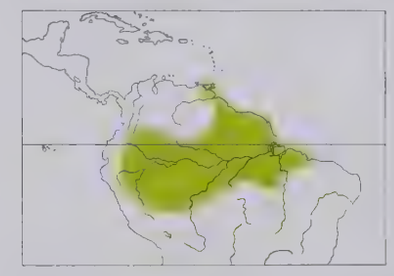
Genus *TODIROSTRUM* Lesson, 1831

179. **Spotted Tody-flycatcher**

Todirostrum maculatum

French: Todirostre tacheté **German**: Fleckenbrust-Todityrann **Spanish**: Titirijí Moteado

Taxonomy. *Todus maculatus* Desmarest, 1806, Cayenne, French Guiana.
Five subspecies recognized.
Subspecies and Distribution.
T. m. amacurense Eisenmann & Phelps, Jr, 1971 - NE Venezuela, Trinidad and N Guyana.
T. m. maculatum (Desmarest, 1806) - Surinam, French Guiana and NE Brazil (from R Xingú E to Amapá, E Pará and N Maranhão).
T. m. signatum P. L. Sclater & Salvin, 1881 - SE Colombia (Caqueta, Amazonas), W Brazil (W Amazonas, W Rondônia), E Ecuador, E Peru and NW Bolivia.
T. m. annectens J. T. Zimmer, 1940 - N Brazil (R Branco and NE Amazonas S to mouth of R Negro).
T. m. diversum J. T. Zimmer, 1940 - C Brazil from R Negro E to R Jamundá and, S of Amazon, from E Amazonas (Tefé and upper R Madeira) E to right bank of R Tapajós.



Descriptive notes. 8·9-10·2 cm; 6·4-8·3 g. Nominate race has grey head with some black and white crown streaks, small white supraloral spot; olive upperparts, wings brownish-black, wing-coverts edged and tipped yellowish (sometimes forming indistinct wingbars), yellowish-edged flight-feathers; tail brownish-black, outer webs of outer feathers with yellow-white margins; throat and upper breast white with distinctive rather narrow black streaks, remaining underparts yellow, streaked dark olive on sides; iris yellowish-orange, sometimes grey or brown; bill black, some white on lower mandible; legs pinkish-grey. Sexes alike. Immature is more narrowly and lightly streaked. Races vary little: *amacurense* and *signatum* have sooty-black forecrown. Voice. Clear, sharp and loud "tee" or "peek", repeated up to 12 times at 2 per second, often immediately answered by mate, thus sounding like "peek-peek" notes.
Habitat. Usually associated with wet areas, e.g. dense shrubby thickets and second growth along edges of mangroves (*Avicennia nitida*), oxbow lakes, creeks, streams, rivers and river islands, also shrubby second growth in abandoned pastures and clearings; also found in taller trees in riparian areas or light woodland, even in gardens around single houses or in towns. Recorded also in young *Cecropia* mixed with grass and openings. Lowlands to 500 m.
Food and Feeding. Recorded foods include arachnoids, flies (Diptera), termites (Isoptera), butterflies (Lepidoptera). Usually in pairs, independent of mixed flocks. Forages mostly in dense vegetation close to ground, also in more open vegetation fairly high in trees; uses short forward and upward sallies to catch prey, with audible snap on capture.
Breeding. Eggs recorded in all months; juveniles with adults in Aug in Colombia. Nest built by both sexes, taking c. 2 weeks, an untidy elongated pouch with roofed side entrance, made of dead grasses and other plant material, bound with spiderweb, lined with plant wool, hanging from drooping branch, usually below 3 m, and regularly (11 of 27 cases) near wasp nest (e.g. of *Polybia occidentalis* and *Nectarina bilineolata*). Clutch 1-2 eggs; incubation by female alone, period 16-21 days; chicks fed by both parents, nestling period c. 15-19 days.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Fairly common to common. Occurs in many national parks and other protected areas throughout its fairly large range. Able to thrive in secondary and converted habitats.
Bibliography. Bangs & Penard (1918), Bennett (1986), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), ffrench (1991), ffrench & Kenefick (2003), Friedmann (1948), Haverschmidt (1955, 1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Marceliano (1982), Meyer de Schauensee (1982), Novaes (1978a), Oren & Parker (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1995, 1997), Schönwetter & Meise (1968), Schubart *et al.* (1965), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Temple (2002), Tostain *et al.* (1992), Walther (2004), Zimmer (1940a).

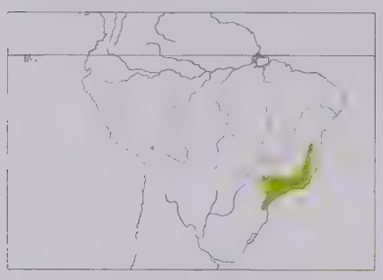
180. **Grey-headed Tody-flycatcher**

Todirostrum poliocephalum

French: Todirostre à tête grise **German**: Gelbzügel-Todityrann **Spanish**: Titirijí Cabecigrís
Other common names: Yellow-lored Tody-flycatcher

On following pages: 181. Common Tody-flycatcher (*Todirostrum cinereum*); 182. Maracaibo Tody-flycatcher (*Todirostrum viridanum*); 183. Painted Tody-flycatcher (*Todirostrum pictum*); 184. Yellow-browed Tody-flycatcher (*Todirostrum chrysocrotaphum*); 185. Black-headed Tody-flycatcher (*Todirostrum nigriceps*).

Taxonomy. *T[odus] poliocephalus* Wied, 1831, Rio de Janeiro, Brazil.
Monotypic.
Distribution. SE Bahia and Minas Gerais S to Santa Catarina, in SE Brazil.



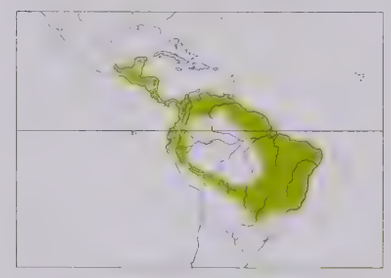
Descriptive notes. 8·8-10·2 cm. Has glossy black forecrown and ocular region, distinctive large bright yellow supraloral spot, slate-grey hindcrown, olive upperparts; wings black, yellow-edged wing-coverts and flight-feathers; tail rounded, olive; throat and underparts bright yellow; iris orange-yellow; bill black; legs bluish-grey. Sexes alike. Juvenile undescribed. VOICE. Call a simple sharp "cheep, chip-chip".
Habitat. Shrubby humid-forest edge and adjacent clearings and gardens, to 1200 m.
Food and Feeding. Insects. Usually in pairs, sometimes alone, generally independent of mixed flocks. Forages in dense vegetation close to ground, also in more open canopy of smaller trees; uses short forward and upward sallies to catch insects, with audible snap on capture.
Breeding. No relevant published information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to common. Occurs in Itatiaia, Serra da Canastra and Tijuca National Parks, Augusto Ruschi Biological Reserve and several other protected areas within its rather small range. Not dependent on intact forest; considered unlikely to become at risk in immediate future.
Bibliography. Bauer & Pacheco (2000), Cory & Hellmayr (1927), Cracraft (1985), Develey (2004), Forrester (1993), Guix *et al.* (1992), Meyer de Schauensee (1982), Pacheco & Whitney (1995), Ridgely & Tudor (1994), do Rosário (1996), Schönwetter & Meise (1968), Sick (1993, 1997), Stotz *et al.* (1996), Venturini *et al.* (2001).

181. Common Tody-flycatcher

Todirostrum cinereum

French: Todirostre familier **German**: Graugelb-Todityrann **Spanish**: Titirijí Común
Other common names: Black-fronted Tody-flycatcher

Taxonomy. [*Todus*] *cinereus* Linnaeus, 1766, Surinam.
Probably forms a superspecies with *T. viridanum*. Eight subspecies recognized.
Subspecies and Distribution.
T. c. virididorsale Parkes, 1976 - SC Veracruz (drainage of R Papaloapan) and adjacent N Oaxaca, in S Mexico.
T. c. finitimum Bangs, 1904 - S Mexico (S Veracruz) S to NW Costa Rica.
T. c. wetmorei Parkes, 1976 - C & E Costa Rica and Panama.
T. c. cinereum (Linnaeus, 1766) - Colombia (except SW), Venezuela (except NW), the Guianas and NE Brazil.
T. c. sclateri (Cabanis & Heine, 1859) - SW Colombia (SW Cauca, Nariño), W Ecuador and NW Peru (Tumbes, Piura, Lambayeque).
T. c. peruanum J. T. Zimmer, 1930 - E Ecuador and E Peru (Loreto S to Cuzco).
T. c. cearae Cory, 1916 - E Brazil (E Pará E to Ceará and Alagoas, S to N Bahia).
T. c. coloreum Ridgway, 1906 - N Bolivia, N Paraguay, S & SE Brazil (S Mato Grosso E to Espírito Santo and São Paulo) and NE Argentina (Misiones).



Descriptive notes. 8·8-10·2 cm; 4·4-8 g. Nominate race male has glossy black forecrown, lores and ocular region, slate-grey hindcrown and upper back giving way to dark olive rear upperparts; wings black, yellow edges and tips of wing-coverts and flight-feathers; tail rounded, black, outer feathers with white tips; throat and underparts bright yellow; iris yellowish to white; bill black, base of lower mandible fleshy white; legs bluish-grey. Female differs in having head greyer, entire lower mandible fleshy white. Juvenile has crown and cheeks dark grey, yellowish wing markings buffy-tinged, paler underparts, dark iris. Race *finitimum* has greyish-green upperparts; *virididorsale* and *wetmorei* have brighter green upperparts; *sclateri* has white throat, sometimes dark iris; *peruanum* resembles nominate, but has dark iris; *coloreum* has paler grey nape, more olive upperparts; *cearae* resembles previous. VOICE. Shrill short single, double or triple note, "tchik", "tik", "teet" or "peept", or series of up to 12 "p-peept" notes; also high-pitched "te'e'e'e'e'et" trill, usually repeated several times, often answered by mate, and sharp "tic" repeated up to 110 times per minute at dawn during nesting season; begging note of fledglings long drawn-out "pseeee, pseeee".
Habitat. All kinds of open and semi-open areas and edges of forest, mangroves and rivers, e.g. lighter woodland, *restinga*, second growth, overgrown shrubby clearings and pastures, shady plantations, open groves, savanna thickets, hedgerows, orchards, gardens, cultivated areas, wasteland; avoids densely forested regions. To 2000 m.
Food and Feeding. Arthropods, including small ants and parasitoid wasps (Hymenoptera), spiders (Araneae), lepidopterans, beetles (Coleoptera), bugs (both Homiptera and Heteroptera), flies (Diptera), damselflies (Zygoptera) and orthopterans; fruit also taken. Usually in pairs or family groups, but sometimes alone, and generally independent of mixed flocks. Forages in dense vegetation close to ground, also in more open mid-level and canopy of trees; tail almost perpetually cocked and wagged. Items taken by gleaning and in short forward and upward sallies, with audible snap on capture.
Breeding. Eggs Dec-Oct. Nest built by both sexes, taking up to 37 days, an untidy elongated pouch with rounded chamber, dangling "tail" and visor-shaded side entrance, made from fine fibres, mosses, grasses and many other plant materials, bound with spiderweb, lined with fine grass, feathers and plant/seed down; suspended from drooping branch (or even telephone wire), usually 1-5 m but sometimes 30 m up, and sometimes near wasp nest. Clutch 2-3 eggs; incubation by female alone, period c. 18 days; chicks fed by both parents, nestling period c. 17-18 days, fledgings partially dependent on parents for up to 43 days.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Fairly common to abundant. Occurs in numerous national parks and other protected areas throughout its large range. Survives well in converted and secondary habitats; benefits from deforestation, spreading into clearings and plantations, where it is usually common.
Bibliography. Anon. (1998a), Bennett (1986), Binford (1989), Bosso (2001), Clements & Shany (2001), Cory & Hellmayr (1927), Cruz & Andrews (1989), Haffer (1975), Haverschmidt (1968, 1978), Haverschmidt & Mees (1994), Hayes (1995), Henderson (2002), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995a), Lee Jones (2004), Miller (1963), Monroe (1968), Olson (1997), Parkes (1976), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Rodrigues & Santos (2000), Salaman (1994), Schönwetter & Meise (1968), Schuchmann (1985), Sherry (1983b, 1984), Sick (1993, 1997), Silveira *et al.* (2003), Skutch (1930), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Tostain *et al.* (1992), Wetmore (1972), Williams & Tobias (1994), Willis (1980), Zimmer (1930, 1940a).

182. Maracaibo Tody-flycatcher

Todirostrum viridanum

French: Todirostre du Maracaïbo **Spanish**: Titirijí de Maracaibo
German: Kurzschwanz-Todityrann
Other common names: Short-tailed Tody-flycatcher

Taxonomy. *Todirostrum viridanum* Hellmayr, 1927, River Aurare, 12 miles [c. 19 km] south of Altagracia, Zulia, Venezuela.
Probably forms a superspecies with *T. cinereum*. Monotypic.
Distribution. Coastal Zulia and Falcón, in NW Venezuela.



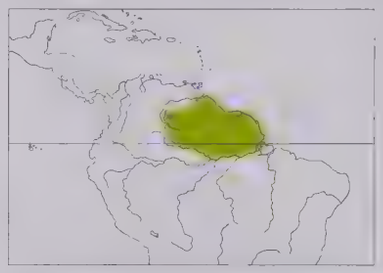
Descriptive notes. 9-10·2 cm. Has black lores, ocular region and forecrown, semi-concealed yellowish-white coronal mark, grey hindcrown; distinctive yellowish-white marks on forehead and supraloral region; upperparts pale olive, wings black, broad buff-yellow edges and tips of wing-coverts and edges of flight-feathers; tail markedly short, black with white tips and edges; pale yellow below, flanks tinged buffy; iris dark, sometimes yellowish-white; upper mandible black, lower mandible pinkish; legs grey. Sexes alike. Juvenile undescribed. VOICE. Song a series of c. 6 sharp "seek" notes.
Habitat. Semi-arid and arid scrub, thickets and woodland (usually with *Acacia*, *Cercidium*, *Cardon* and *Opuntia*); also tropical deciduous forest and gallery forest. To 200 m.
Food and Feeding. Arthropods. Forages usually in pairs, sometimes alone, in dense scrubby vegetation close to ground, sometimes also a little higher in smaller trees. Prey caught by short forward and upward sallies.
Breeding. No information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Caribbean Colombia and Venezuela EBA. Fairly common. Although there are still large expanses of suitable habitat within the species' small range, none is protected; furthermore, substantial areas have been destroyed, principally around L Maracaibo, by overgrazing, firewood-gathering, tourist development and pollution.
Bibliography. Collar & Andrew (1988), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Hilty (2003), Parker *et al.* (1996), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stotz *et al.* (1996).

183. Painted Tody-flycatcher

Todirostrum pictum

French: Todirostre peint **German**: Schwarzflecken-Todityrann **Spanish**: Titirijí Pintado

Taxonomy. *Todirostrum pictum* Salvin, 1897, Annai, Guyana.
Forms a superspecies with *T. chrysocrotaphum* and *T. nigriceps*, and all sometimes treated as conspecific. Monotypic.
Distribution. SE Venezuela (Amazonas, Bolívar), the Guianas and adjacent N Brazil.



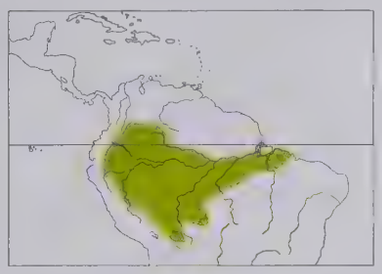
Descriptive notes. 9-10·2 cm; 6-8 g. Has glossy black head, white supraloral spot, long white submoustachial stripe; small yellow neckband, olive back and rump; wings black, two yellow wingbars, yellow feather edges; tail black, olive outer edges; throat whitish with black streaks, bright yellow underparts, black streaks on upper breast; iris dark brown or yellow; bill black; legs blackish. Sexes alike. Juvenile undescribed. VOICE. Call "chevik" or "pi-pik"; song 8-12 sharp, piercing "peek" notes at c. 2 per second; also a penetrating whistle, "teeng-teeng-teeng-teeng".
Habitat. Canopy of tall humid *terra firme*, *várzea* and tropical dry forest, forest borders and tall second growth; also adjacent clearings and plantations with scattered tall trees. To 400 m.
Food and Feeding. Arthropods, including e.g. flies (Diptera). Forages alone or in pairs, rarely with mixed-species flocks, in high outer-canopy foliage and along forest edges. Makes short forward and upward sallies.
Breeding. Oct in Surinam. Nest built by both sexes, an untidy elongated pouch with dangling "tail" and side entrance, in one case suspended from drooping branch high in garden tree near wasp (Hymenoptera) nest; nests usually sited higher up than those of congeners. Apparently no other relevant information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to fairly common; often overlooked, most frequently located by voice.
Bibliography. Bangs & Penard (1918), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Friedmann (1948), Haverschmidt & Mees (1994), Hilty (2003), Naka (2004), Novaes (1978a), Ridgely & Tudor (1994), Schönwetter & Meise (1968), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992).

184. Yellow-browed Tody-flycatcher

Todirostrum chrysocrotaphum

French: Todirostre bridé **German**: Goldbrauen-Todityrann **Spanish**: Titirijí Cejiamarillo

Taxonomy. *Todirostrum chrysocrotaphum* Strickland, 1850, Peru.
Forms a superspecies with *T. pictum* and *T. nigriceps*, and all sometimes treated as conspecific. Five subspecies recognized.
Subspecies and Distribution.
T. c. guttatum Pelzeln, 1868 - Colombia (S from W Meta and Guainía) and NW Brazil S to E Ecuador and extreme NE Peru (NE Loreto).
T. c. chrysocrotaphum Strickland, 1850 - N Peru and W Brazil (E to Tefé, in C Amazonas).
T. c. neglectum Carriker, 1932 - E Peru, SW Brazil and N Bolivia.
T. c. simile J. T. Zimmer, 1940 - left bank of R Tapajós, in W Pará (NC Brazil).
T. c. illigeri (Cabanis & Heine, 1859) - NE Brazil from right bank of R Tapajós E to N Maranhão.



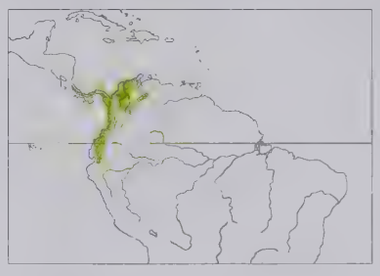
Descriptive notes. 8·6-10·2 cm; 7 g. Distinctive, with broad yellow postocular stripe on glossy black head. Nominate race has white supraloral spot, olive upperparts, black wings with two yellow wingbars and yellow edgings; short black tail; bright yellow underparts, black streaks on malar area and across breast; iris variable usually dark, sometimes pale; bill blackish; legs bluish-grey. Sexes alike. Juvenile undescribed. Race *guttatum* has white chin, heavier black streaks on malar area and breast; *neglectum* is somewhat paler than nominate, no streaks below, lacks supraloral spot; *simile* resembles previous but with white supraloral spot; *illigeri* lacks supraloral spot but has black malar stripe. Voice. Call a loud series of usually 8-12 sharp, evenly spaced "pik", "tsip" or "pip" notes.
Habitat. Canopy and edge of *terra firme* and *várzea* forest and taller second growth, adjacent shrubby clearings with scattered large trees; to 1400 m.
Food and Feeding. Insects recorded. Usually in pairs, sometimes alone; rarely with mixed-species flocks. Forages high up in foliage of outer canopy; also along forest edge, when sometimes descends lower; tail usually held cocked. Makes short forward and upward sallies.
Breeding. Few data. Nest found in Jun in Colombia, 4-5 m above ground in second growth; another in Jul in Ecuador, 35 m up in emergent tree in forest. In Ecuador, 3 successive nests built in same tree, Jul, Apr and Jul; all c. 35-40 m up in large kapok (*Ceiba*) tree; hanging globular nests, lined with kapok seed down; adult bringing food to second nest in late May; latter 2 nests were situated in close proximity to a paper wasp (Vespidae) nest.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common, but often overlooked. Occurs in numerous protected areas, including many national parks, throughout its rather large range. Much of its habitat remains in relatively pristine condition.
Bibliography. Allen (1995), Bates & Parker (1998), Blake (1962), Cory & Hellmayr (1927), Greeney *et al.* (2004), Haffer (1997b), Haverschmidt (1968), Hilty & Brown (1986), Meyer de Schauensee (1982), Oren & Parker (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1995, 1997), Schönwetter & Meise (1968), Schulenberg *et al.* (2001), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1958), Zimmer (1940a).

185. Black-headed Tody-flycatcher

Todirostrum nigriceps

French: Todirostre à tête noire **German**: Schwarzkopf-Todityrann **Spanish**: Titirijí Cabecinegro

Taxonomy. *Todirostrum nigriceps* P. L. Sclater, 1855, Sierra Nevada de Santa Marta, Colombia.
Forms a superspecies with *T. pictum* and *T. chrysocrotaphum*, and all sometimes treated as conspecific. Monotypic.
Distribution. E Costa Rica, Panama, N & W Colombia, extreme W Venezuela and W Ecuador.



Descriptive notes. 8·10·2 cm; 6·6·5 g. Distinctive. Has glossy black crown and side of head contrasting with white throat and yellowish-olive upperparts; sometimes narrow white supraloral spot; wings black, two yellow wingbars and yellow edgings; tail rather short, black; underparts bright yellow; iris dark brown; bill black; legs blue-grey to blackish. Sexes alike. Juvenile has duller black head, yellow-tinged throat, paler yellow underparts, olive-tinged wing markings. Voice. Call a lively single or double "chip", "peep" or "pik"; song a slow series of usually 5-8 (up to 12) high-pitched sharp "tsip" or "jyip" notes, the first somewhat lower, final ones accelerating and increasing slightly in volume; incubating female utters soft trill.
Habitat. Canopy and edge of humid forest and second growth, and adjacent plantations, clearings and pastures with scattered tall trees; to 1500 m.
Food and Feeding. Arthropods, e.g. ants and parasitoid wasps (Hymenoptera), flies (Diptera), damselflies (Zygoptera), bugs (both Heteroptera and Homoptera), lepidopterans, beetles (Coleoptera), spiders (Araneae). Alone or in pairs, rarely with mixed-species flocks. Forages inside dense foliage of upper mid-level to high canopy; also along forest edge, when sometimes found lower. Prey captured in short forward and upward sallies; ants also taken from extrafloral nectaries and *Cordia* twig nodes.
Breeding. Nest found in Jun and birds taken in breeding condition in Feb, in Colombia; nest found in Aug, in Panama. Nest is an untidy short pouch with dangling "tail" and visor-shaded side entrance, made from plant fibres and lined with seed down, suspended from drooping branch 3-15 m up, almost always near a wasp nest. Clutch 1 egg; no information available on incubation and fledging periods.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common, but probably often overlooked. Occurs in Rancho Naturalista and Río Negro Jaguar Reserve, in Costa Rica; in Darién National Park, in Panama; common in Tayrona National Park and fairly common in Río Claro Reserve, in Colombia; in Ecuador, found in Río Palenque Science Centre and also in Manta Real (designated for protection), near Guayaquil (Azuay).
Bibliography. Anon. (1998a), Chapman (1917c), Cory & Hellmayr (1927), Haffer (1975), Hilty (1997, 2003), Hilty & Brown (1986), Karr *et al.* (1990), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Salaman (1994), Schönwetter & Meise (1968, 1988), Sherry (1983b, 1984), Skutch (1972), Slud (1960, 1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Strewe (2000b), Strewe & Navarro (2003), Wetmore (1972).



PLATE 28

inches 3

cm 8

Genus *RHYNCHOCYCLUS*

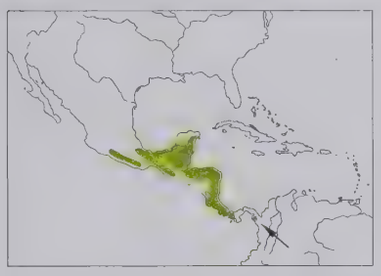
Cabanis & Heine, 1859

186. **Eye-ringed Flatbill**

Rhynchocyclus brevirostris

French: Platyrhynque à bec court **Spanish**: Picoplano de Anteojos
German: Augenring-Breitschnabeltyrann

Taxonomy. C[*yclorhynchus*] *brevirostris* Cabanis, 1847, Jalapa, Veracruz, Mexico.
Formerly considered conspecific with *R. pacificus*. Three subspecies recognized.
Subspecies and Distribution.
R. b. pallidus Binford, 1965 - Pacific slope of Oaxaca (Putla and Minitán E to Pluma Hidalgo), probably also in Guerrero, in S Mexico.
R. b. brevirostris (Cabanis, 1847) - S Mexico E of Isthmus of Tehuantepec (E Veracruz and E Oaxaca E to Yucatán Peninsula) S to W Panama (Chiriquí, Veraguas).
R. b. hellmayri Griscom, 1932 - mountains of E Panama and extreme NW Colombia (Cerro Tacarcuna, in NW Chocó).



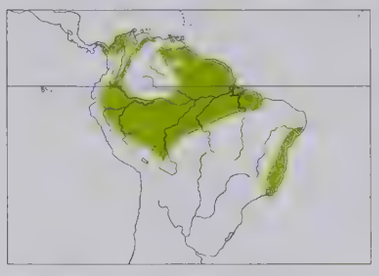
Descriptive notes. 15-17 cm; 21-23 g. Large-headed flycatcher. Male has olive-green head and upperparts, conspicuous white eyering, faint dark smudge below eye, greyish lores and cheeks, paler greyish patch on auriculars bordered behind by dusky patch; wings and tail dusky with paler yellow-olive edgings, stiffened comb-like barbs on outer primaries; tail often appears notched; throat and chest dull or dusky olive-green, becoming paler with pale greyish or yellowish shaft streaks on lower breast and sides, belly pale yellow; iris dark; bill large, broad and flat, upper mandible black, lower mandible pale horn; legs grey. Differs from *R. olivaceus* in bolder white eyering, brighter yellow on wings. Female lacks comb-like barbs on outer primaries. Juvenile is similar but with brighter yellow on belly and edges of wing feathers, more coarse streaking on sides, little or no breast streaking and dusky on auriculars. Races differ little: *pallidus* is slightly paler than nominate; *hellmayri* is darker above and below than nominate, with duller yellow belly. Voice. Variety of notes uttered 1-5 times, including high-pitched squeaky and rising "zweeip" or "sweeip", a cicada-like "zzrrip", shrill lisping "siiir" or "ssssi" note like that of *Tolmomyias sulphurescens*, and longer "weeep weeep wip-wip-wip" with sputtering quality.
Habitat. Upper understorey and middle levels of humid evergreen and semi-deciduous forest, forest borders and adjacent tall second growth; favours shady ravines. Sea-level to 2100 m in Mexico and Costa Rica; 600-1500 m in Panama and Colombia, i.e. above *R. olivaceus*.
Food and Feeding. Diet largely arthropods, including beetles (Coleoptera), homopterans and caterpillars; berries and arillate seeds also eaten. Forages alone, often at edge of mixed-species flocks, especially those led by tanagers (of genera *Chlorothraupis*, *Chlorospingus*) and Black-faced Grosbeaks (*Caryothraustes poliogaster*); also frequents army-ant swarms (Costa Rica). Sits erect and quiet on low perch 1-10 m up, slowly turning head to peer upwards into mid-storey or down into understorey; rapidly darts out moderate distances in upward sally or hover-glean manoeuvres to capture prey from undersides of leaves and twigs, then dropping away to new perch; rarely sallies to air.
Breeding. Mar-Jun in Mexico and Costa Rica. Nest a bulky, pear-shaped structure with downward-projecting entrance spout at side of bottom, made of rootlets, coarse fibres and dead leaves, suspended 1-5-12 m up from tip of thin twig or vine drooping over open space or small forest stream; nest also used by adults as dormitory during all seasons. Clutch: 2-3 eggs; no information on incubation and fledging periods.
Movements. Largely resident; descends to lowlands during Dec-Mar non-breeding season in Mexico.
Status and Conservation. Not globally threatened. Uncommon to fairly common or common throughout range. Probably locally extinct wherever deforestation has been intense, e.g. in lowlands in Panama. Occurs in Río Bravo Conservation and Management Area, Lamanai Archaeological Reserve and Columbia River Forest Reserve, all in Belize, Rancho Naturalista and Tarcol Lodge, in Costa Rica, and Darién National Park, in Panama.
Bibliography. Anon. (1998a), Binford (1989), Blake (1958), Brodkorb (1943), Cory & Hellmayr (1927), Dearborn (1907), Haffer (1974), Hilty & Brown (1986), Howell & Webb (1995a), Karr *et al.* (1990), Land (1970), Lee Jones (2004), Lowery & Dalquest (1951), Meyer de Schauensee (1982), Monroe (1968), Payne (1984), Paynter (1955), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Rowley (1966, 1984), Skutch (1985), Slud (1960, 1964), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Thurber *et al.* (1987), Wetmore (1944, 1972).

187. **Olivaceous Flatbill**

Rhynchocyclus olivaceus

French: Platyrhynque olivâtre **German**: Oliv-Breitschnabeltyrann **Spanish**: Picoplano Oliváceo

Taxonomy. *Platyrhynchos olivaceus* Temminck, 1820, Rio de Janeiro, Brazil.
Geographic variation subtle, and majority of races weakly differentiated. Nine subspecies recognized.
Subspecies and Distribution.
R. o. bardus (Bangs & Barbour, 1922) - E Panama and NW Colombia (N Chocó E to S Bolívar).
R. o. mirus Meyer de Schauensee, 1950 - NW Colombia (lower Atrato Valley and inland from coast).
R. o. flavus (Chapman, 1914) - N & C Colombia (Santa Marta and Magdalena to W Meta) and N Venezuela.
R. o. jelambianus Aveledo & Pérez, 1994 - NE Venezuela (Sucre, N Monagas).
R. o. tamborensis Todd, 1952 - R Lebrija (Santander), in C Colombia.
R. o. aequinoctialis (P. L. Sclater, 1858) - SC & SE Colombia (Meta S to Putumayo and Amazonas) S to NC Bolivia (Cochabamba).
R. o. guianensis McConnell, 1911 - S Venezuela, the Guianas and N Brazil.
R. o. sordidus Todd, 1952 - Brazil S of Amazon (R Tapajós E to R Tocantins and N Maranhão).
R. o. olivaceus (Temminck, 1820) - NC & E Brazil (E Pará; Pernambuco S to Rio de Janeiro).



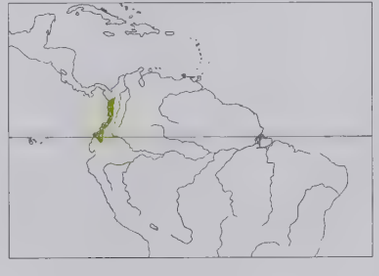
Descriptive notes. 15 cm; 19-23 g. Large-headed, dark olive flatbill with white eyering surrounding large dark eye. Head and upperparts dark olive, wings dusky, wing-coverts and secondaries edged with ochre, buff or yellow (two dull wingbars), tertials edged yellow; tail dusky with pale outer margins; throat pale grey or pale yellow, breast greyish-olive, belly to vent and flanks pale yellow, breast and flanks flammulated or streaked olive; iris dark; bill very wide and flat, upper mandible black, lower mandible pale horn; legs blue-grey. Sexes similar. Juvenile is duller olive above, paler yellow below, with more ochraceous olive uppertail-coverts. Races differ minimally: *flavus* is slightly larger, longer-tailed, greener above and yellower below than *aequinoctialis*; *jelambianus* has on average wider bill than previous; other races exhibit equally minor morphological differentiation. Voice. Song, mainly at dawn, 5-7 thin, high, nasal, upslurred notes, "tree-tree-tree-tree-e-e-e" or "tuu tee tee ti ti", ascending faster towards end; call a loud, harsh, slightly buzzy "tsheet" or "breeyp" or "pfweet".
Habitat. Mostly lower level of humid forest (especially *terra firme*, also *várzea*) and older second-growth woodland; absent from extremely moist forest on Panama-Colombia border and from black-water and sandy-soil areas of upper R Negro and R Orinoco drainages. Sea-level to 500 m; to 1000 m near Andes.
Food and Feeding. Feeds on arthropods. Forages alone, often at edge of understorey mixed-species flocks of various antwrens and antshrikes (Thamnophilidae) and ovenbirds (Furnariidae). Posture erect and quiet on perch. Will lethargically turn its head to peer into middle storey or understorey, rapidly dart out moderate distances in upward sally or hover-glean manoeuvres to capture arthropods from undersides of leaves and twigs, then travel to new perch; sallies to air rare.
Breeding. Feb-Jun in N Colombia. Nest a bulky, pear-shaped structure 15 cm long, with downward-projecting entrance spout at side of bottom; frequently built near wasp nest in Santa Marta region of Colombia. Clutch 2-3 eggs; no information on incubation and fledging periods.
Movements. Probably resident throughout range.
Status and Conservation. Not globally threatened. Uncommon to fairly common in most of range; rare to locally uncommon in Ecuador, where apparently absent from some areas of presumably suitable lowland forest. Occurs in many national parks and other protected areas throughout its range, e.g. Darién National Park, in Panama, Tinigua National Park and Río Claro Reserve, in Colombia, Yacambú National Park, in Venezuela, Tambopata-Candamo Reserved Zone, in Peru, Madidi National Park and Pilón Lajas Biosphere Reserve, in Bolivia, and Tapajós National Park, Murici Ecological Reserve and Sooretama Biological Reserve, in Brazil. Tolerates converted habitats, and not likely to be at any risk in immediate future.
Bibliography. Anon. (1998a), Aveledo & Pérez (1994), Blake (1962), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Cracraft (1985), Gilliard (1941), Haffer (1974, 1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Karr *et al.* (1990), Oren & Parker (1997), Payne (1984), Piratelli *et al.* (2002), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Todd & Carriker (1922), Tostain *et al.* (1992), Wetmore (1972), Willis (1980), Zimmer (1930, 1939c).

188. **Pacific Flatbill**

Rhynchocyclus pacificus

French: Platyrhynque de Colombie **Spanish**: Picoplano del Pacífico
German: Pazifik-Breitschnabeltyrann

Taxonomy. *Craspedoprion pacificus* Chapman, 1914, Juntas de Tamaná, Chocó, Colombia.
Was for long considered a race of *R. brevirostris*; the two may not be sister-taxa. Monotypic.
Distribution. Chocó region of W Colombia (S from mid-Atrato Valley) and NW Ecuador (Esmeraldas S to S Pichincha).



Descriptive notes. 15 cm; 23·5-26·5 g. Large-headed flycatcher. Has dark olive head and upperparts, indistinct grey eyering; wings and tail dusky brown, conspicuous tawny-buff or ochre margins of wing-coverts (no wingbars), olive margins of primaries and secondaries, buff margins on tertials; throat and breast flammulated olive with faint yellow shaft streaks, belly and flanks yellow, flanks streaked olive; iris dark; bill large, broad and flat, upper mandible black, lower mandible pale; legs blue-grey. Sexes alike. Juvenile undescribed. Voice. Song a fast series of descending clear to burry notes, "tchwee-tee-te-tu-tu-tu"; call a hissing "scheeeuw".

On following pages: 189. Fulvous-breasted Flatbill (*Rhynchocyclus fulvipectus*); 190. Yellow-olive Flycatcher (*Tolmomyias sulphurescens*); 191. Orange-eyed Flycatcher (*Tolmomyias traylori*); 192. Yellow-margined Flycatcher (*Tolmomyias assimilis*); 193. Grey-crowned Flycatcher (*Tolmomyias poliocephalus*); 194. Yellow-breasted Flycatcher (*Tolmomyias flaviventris*); 195. Cinnamon-crested Spadebill (*Platyrinchus saturatus*); 196. Stub-tailed Spadebill (*Platyrinchus cancrominus*); 197. White-throated Spadebill (*Platyrinchus mystaceus*); 198. Golden-crowned Spadebill (*Platyrinchus coronatus*); 199. Yellow-throated Spadebill (*Platyrinchus flavigularis*); 200. White-crested Spadebill (*Platyrinchus platyrhynchos*); 201. Russet-winged Spadebill (*Platyrinchus leucoryphus*).

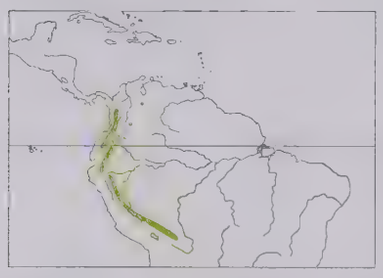
Habitat. Lower growth of humid lowland forest and mature secondary woodland, usually sea-level to 1000 m; to 800 m in Ecuador, to 1100 m in Colombia (Valle). Replaced by *R. fulvipectus* at higher elevations.
Food and Feeding. Feeds on arthropods. Forages alone or in pairs, often at edge of understorey mixed-species flocks including furnariids, *Myrmotherula* antwrens and antshrikes (Thamnophilidae). Sits erect and quiet on low perch, such as open branch or liana, turning head to peer upwards into mid-storey or understorey; Rapidly darts out medium distances in upward sally or hover-glean manoeuvres to capture prey from undersides of leaves and twigs, then drops to new perch; rarely sallies to air.
Breeding. Birds in breeding condition from Mar in Colombia. No other information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common; often overlooked. Restricted to Chocó region. Uncommon in Río Palenque Science Centre and Tinalandia Private Reserve, in Ecuador; small numbers recorded from forest patches in Pichincha.
Bibliography. Chapman (1917c), Cory & Hellmayr (1927), Cracraft (1985), Haffer (1975), Hilty (1997), Hilty & Brown (1986), Jahn & Mena (2002g), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996), Strewe (2000b), Zimmer (1939c).

189. **Fulvous-breasted Flatbill**

Rhynchocyclus fulvipectus

French: Platyrhynque à poitrine fauve **Spanish**: Picoplano Pechirrufo
German: Ockerbrust-Breitschnabeltyrann

Taxonomy. *Cyclorhynchus fulvipectus* P. L. Sclater, 1860, Nanegal, Pichincha, Ecuador.
Monotypic.
Distribution. Andes of W Venezuela (Táchira), Colombia (W range, also W slope of E range in Cundinamarca), NW & E Ecuador, E Peru and NW Bolivia.



Descriptive notes. 15 cm; 26 g. Large-headed flycatcher. Has dark olive head and upperparts, faint pale greyish eyering; wings and tail duskier, conspicuous tawny-buff or ochre edges of wing-coverts and remiges (no wingbars); chin grey, lower throat and breast distinctively dull tawny-rufous; belly, flanks and vent yellow, streaked olive on flanks; iris dark; bill large, broad and flat, upper mandible black, lower mandible pale; legs grey. Sexes similar. Juvenile undescribed. Voice. Call (Ecuador) an infrequent wheezy upslurred "zhreeyp".
Habitat. Lower growth of humid to wet montane forest, foothill forest, second growth, and shrubby borders, especially near streams. Mainly 750-2100 m; higher, 1900-2300 m, on W slope of E Andes (S to head of Magdalena Valley) in Colombia.
Food and Feeding. Feeds on arthropods. Forages alone, often at edge of understorey mixed-species flocks. Sits erect and quiet on low perch 1-4 m up, turning head to peer upwards into mid-storey or understorey. Rapidly darts out moderate distances in upward sally or hover-glean manoeuvres to capture prey from undersides of leaves and twigs, then dropping away to new perch; rarely sallies to air.
Breeding. May in Colombia (N end of W Andes). Nest a bulky, pear-shaped structure with downward-projecting entrance spout at side of bottom, made of rootlets, coarse fibres and dead leaves, suspended from tip of thin twig or vine drooping over open space or small forest stream. Clutch presumably 2-3 eggs; no other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare to uncommon; generally rare at edge of its range in Venezuela; uncommon in Ecuador. Occurs in Tambito Nature Reserve, in Colombia, and Podocarpus National Park, in Ecuador.
Bibliography. Chapman (1917c), Clements & Shany (2001), Cory & Hellmayr (1927), Hennessey, Herzog & Sagot (2003), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996), Strewe (2000b), Zimmer (1930, 1939c).

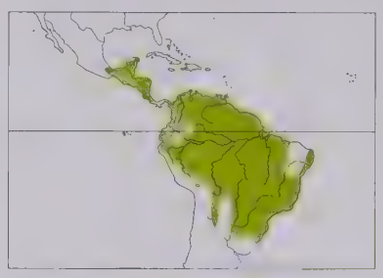
Genus *TOLMOMYIAS* Hellmayr, 1927

190. **Yellow-olive Flycatcher**

Tolmomyias sulphurescens

French: Platyrhynque jaune-olive **Spanish**: Picoplano Sulfuroso
German: Olivscheitel-Breitschnabeltyrann
Other common names: Yellow-olive Flatbill

Taxonomy. *Platyrhynchus sulphurescens* Spix, 1825, Rio de Janeiro, Brazil.
Relationships within genus uncertain, pending completion of major genetic study. Taxonomy of present species requires further resolution; regional differences in voice, plumage and eye colour suggest to some authorities that races may represent more than one species; some plumage variation appears clinal, but clines are discordant; several races, particularly within South America, may not be valid. Sixteen subspecies tentatively recognized.
Subspecies and Distribution.
T. s. cinereiceps (P. L. Sclater, 1859) - S Mexico (Oaxaca and Veracruz E to Yucatán Peninsula) S to Costa Rica.
T. s. flavoolivaceus (Lawrence, 1863) - E Panama and NW Colombia.
T. s. asemus (Bangs, 1910) - W & C Colombia.
T. s. exortivus (Bangs, 1908) - NE Colombia and N Venezuela.
T. s. berlepschi (Hartert & Goodson, 1917) - Trinidad.
T. s. cherriei (Hartert & Goodson, 1917) - E Venezuela, the Guianas and N Brazil (upper R Branco and Amapá).
T. s. duidae J. T. Zimmer, 1939 - S Venezuela and NW Brazil (N Amazonas perhaps to W Pará).
T. s. confusus J. T. Zimmer, 1939 - SW Venezuela, E Colombia and NE Ecuador.
T. s. aequatorialis (Berlepsch & Taczanowski, 1884) - W Ecuador and NW Peru (Tumbes, Piura).
T. s. peruvianus (Taczanowski, 1875) - SE Ecuador and N & C Peru (Amazonas, S San Martín, E Pasco, Junín).
T. s. insignis J. T. Zimmer, 1939 - NE Peru (lower R Ucayali, in Loreto) and NW Brazil (R Juruá E to R Jamundá and R Madeira).
T. s. mixtus J. T. Zimmer, 1939 - NC Brazil (E Pará, NW Maranhão).
T. s. inornatus J. T. Zimmer, 1939 - SE Peru (N Puno).
T. s. pallescens (Hartert & Goodson, 1917) - C, S & E Brazil (S Maranhão, Piauí and Paraíba S to Mato Grosso, Bahia and possibly W Minas Gerais) S to Bolivia (Beni S to Tarija) and N Argentina (S to Tucumán).
T. s. grisescens (Chubb, 1910) - C Paraguay and N Argentina (E Chaco and Formosa, N Santa Fe).
T. s. sulphurescens (Spix, 1825) - E Paraguay, NE Argentina (Misiones) and SE Brazil (E Minas Gerais and Espírito Santo S to Rio Grande do Sul).



Descriptive notes. 13-15·5 cm; 14·5-15·2 g. Nominate race has dark olive crown, narrow whitish supraloral and eyering, pale olive auriculars with dusky patch towards rear; nape dark olive, upperparts olive-green; wings dusky or blackish, two yellowish-olive wingbars, yellowish margins of remiges; pale greenish-grey throat, becoming greenish-olive on breast and flanks, bright yellow on belly and undertail-coverts; iris variable, typically pale brown to pale grey; bill wide and flat, upper mandible black, lower mandible pale grey to pale flesh-coloured; legs grey. Sexes similar. Juvenile is paler below, white eyering broken, dark brown or olive iris becoming paler with maturity. Races vary in extent of olive or grey on crown and throat, general brightness of green on back and yellow on belly, also iris colour, although differences often quite subtle: *cinereiceps* has light grey crown, no dusky auricular mark, cheeks and throat pale grey, belly pale yellow, iris whitish to pale yellow; *flavoolivaceus* is rather small, has crown and throat more green, slight auricular mark, bright yellow belly; *asemus* has grey crown, dull grey throat and breast, paler dull yellow belly; *exortivus* has olive crown with slight grey tinge, grey chin, dull olive breast, medium-yellow belly; *berlepschi* and *cherriei* resemble previous, but slightly duller yellow below; *duidae* is similar to last, but darker olive breast and crown; S races *pallescens* and *grisescens* have darker olive crown than N races, lores and cheeks pale, brighter green on back, pale green-grey throat, greener breast, bright yellow belly, greyish iris, closely resemble nominate; *mixtus* appears to be somewhat transitional, has medium-yellow belly (as N group) and darker crown (as S group); *peruvianus* has rather dark grey crown, more distinct auricular patch, pale green-grey throat, dull olive breast, bright yellow belly, usually dark iris; *insignis* has olive-grey crown, duller underparts than previous, usually pale iris; *inornatus* is very like last but less olive on crown, slightly duller below; *aequatorialis* has dark grey crown, dull yellow-green breast, dark iris; *confusus* appears transitional between W & N races, with medium-grey crown, dull olive breast, medium-yellow belly. Voice. Song highly variable geographically, e.g. a series of 2-6 sharp or buzzy high notes, "dzeeyp, dzyeep, dzeep", sometimes with pause after first note, becoming sharper with each repetition, like that of *T. assimilis* but less nasal; in Venezuela, similar buzzy nasal "ps ps psst psst PSST" given N of Orinoco, whereas, S of river, typically a sharp "spik spik" with pause of 1-3 seconds between notes, or several "spik" notes in long irregular sequence; song W of Andes in Ecuador (*aequatorialis*) a thin and well-enunciated series of quick notes as 'psee-pset-pset-pset', E of Andes the notes a little longer, e.g. 'swit-swit-swit-swit-swit'; in all areas often a long pause between songs. In Panama, call thin, usually consists of 1-2 sibilant notes, "dzz", "dzz" or "tsit, tsit", sometimes followed by fast musical rattle. Voice of nominate race described as a squeaky whistle, "sheet, shi-eet", given three times.
Habitat. Wide variety of dry to humid forest habitats, including borders of humid and montane forests, and dry, deciduous and gallery forests, isolated woodlots, shady plantations, and tall secondary growth; inhabits river islands and riparian habitats in Amazonia and S Venezuela. In Surinam, common in wooded sand ridges in coastal region, savanna forest and interior. Generally does not occur in humid lowland forest (*terra firme*), where replaced by *T. assimilis* and *T. poliocephalus* (Costa Rica); where these congeners absent (SE Brazil, and E slope of Andes in Ecuador and Peru), present species does inhabit tall humid forest. Mostly lowlands below 1500 m, smaller numbers on Andean slopes to c. 1800 m (900-1700 m in W Ecuador) and to 1900 m N of Orinoco (Venezuela); to 1200 m in Mexico.
Food and Feeding. Food insects, including beetles (Coleoptera), ants (Hymenoptera), homopteran bugs; recorded prey include beetles of family Scolytidae. Small berries also occasionally taken. Forages singly or in pairs, alone or with mixed-species flocks, inside crowns and at lower and middle levels of forest. Perches with more upright posture than congeners, rarely cocks tail. Slowly and deliberately searches foliage for prey, then makes short (up to c. 2 m) sallies, upward strikes, hover-gleans, perch-gleans and aerial chases to capture prey, often from undersides of leaves, then dropping down or continuing to new perch. In Costa Rica, sometimes picks at bare branches.
Breeding. Apr-Jun in Costa Rica, Apr-Jul in Trinidad and Jan-Jun in N Colombia. Male courtship displays involve trembling with wings stretched. Nest a pear-shaped bag made of black rootlets and fungal rhizomorphs, sometimes mixed with grass and cobwebs, composed of roof, chamber (in form of a bag), and downward-pointing perpendicular "chimney" as entrance, 1·5-11 m up and often hung from exposed branch or vine, often on woodland edge, over stream or roadside, regularly near wasp nest; frequently nests in bull's horn acacia (*Acacia*) in Costa Rica; nest also used as a dormitory. Clutch 2-3 eggs; in Costa Rica, incubation by female, period 17-18 days, chicks brooded only by female, fed by both parents, nestling period 22-24 days.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to abundant in most of range, though somewhat local on parts of E slope of Andes. The most widespread member of genus. Occurs in numerous national parks and other protected areas. Given its tolerance of wide variety of wooded habitats, including converted habitat, and its large range, this species is considered unlikely to become threatened in near future.
Bibliography. Anon. (1998a), Binford (1989), Brooks *et al.* (1993), Canevari *et al.* (1991), Chapman (1917c), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Di Giacomo (2004), ffrench (1991), Fjeldså & Maijer (1996), Greenberg (1992), Gyldenstolpe (1945a, 1945b), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Lee Jones (2004), Lowen *et al.* (1996), Meyer de Schauensee & Phelps (1978), Miserendino (1998), Monroe (1968), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Ridgely (1981), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), do Rosário (1996), Rowley (1984), Schulenberg &

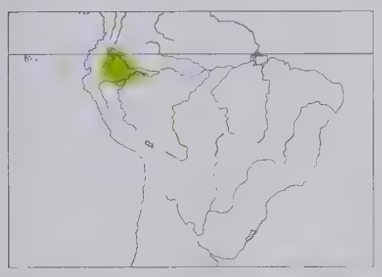
Parker (1997), Short (1975), Sick (1979b, 1993, 1997), Slud (1964), Souza (2002), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Temple (2002), Tostain *et al.* (1992), Wetmore (1926, 1939, 1972), Williams & Tobias (1994), Zimmer (1939c).

191. Orange-eyed Flycatcher

Tolmomyias traylori

French: Platyrhynque de Traylor **Spanish**: Picoplano Ojinaranja
German: Orangeaugen-Breitschnabeltyrann

Taxonomy. *Tolmomyias traylori* Schulenberg and Parker, 1997, 5 km ESE of Orán, Loreto, Peru.
Relationships within genus uncertain, pending completion of major genetic study; appears to be closely related to *T. sulphurescens* complex of taxa. Monotypic.
Distribution. SE Colombia (SE Putumayo, NW Amazonas), E Ecuador (E Napo) and NE Peru (N of Amazon in Loreto).



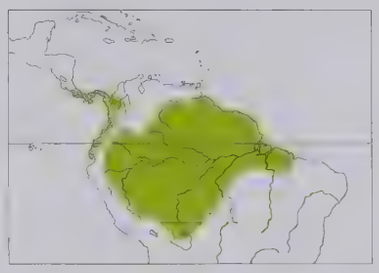
Descriptive notes. 13·5 cm; 11·5 g. Has buff supraloral area and ear-coverts, cinnamon forehead with olive-grey feather tips, dusky grey crown contrasting with olive-green upperparts; wings and tail duskier, two yellowish wingbars, yellowish edges of flight-feathers; throat whitish-buff, ochraceous-buff wash across breast, chest dull buff, belly bright yellow, tinged olive on flanks, creamy undertail-coverts; iris pale yellow-orange; bill broad, flat, relatively small, upper mandible black, lower mandible pale purple; legs dull purple (appearing grey at distance). Sexes alike. Juvenile not described. Voice. Call a distinct two-part, buzzy "wheeeeezzz-birrt" or "psi-trrrrrrrrr", given at long intervals, sometimes few buzzy notes appended; song a series of 5-7 well-enunciated "zhreee" notes, fairly similar to that of race *viridiceps* of *T. flaviventris* but notes somewhat longer and more wheezing.
Habitat. Restricted to middle levels, subcanopy and borders of *várzea* forest, below 400 m. Separated ecologically from congeners occurring at same sites; *T. poliocephalus* occupies canopy of *várzea* and second-growth forest, *T. assimilis* prefers *terra firme* forest, and *T. flaviventris* occupies *Cecropia*-dominated second growth and river islands.
Food and Feeding. Diet insects. Forages alone or, sometimes, with mixed flocks. Items obtained primarily by sallying to leaves.
Breeding. No information available.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Rare and local, although probably often overlooked within its small range. Recorded as far E as Amacayacu National Park, in extreme SE Colombia. In Ecuador, recorded at sites near R Napo, at Taracoa, Sacha Lodge, La Selva, and Kapawi Lodge and Ecological Reserve on upper R Pastaza, and probably in R Aguarico drainage. Occurs at ExplorNapo Lodge, in Peru. The species' rainforest habitat is as yet little disturbed, but its specialization on *várzea* and other riverine habitats may pose a problem as soon as areas are colonized by humans.
Bibliography. Clements & Shany (2001), Green (1998), Ridgely & Greenfield (2001), Schulenberg & Parker (1997), Stap (1990).

192. Yellow-margined Flycatcher

Tolmomyias assimilis

French: Platyrhynque à miroir **Spanish**: Picoplano Aliamarillo
German: Flügelspiegel-Breitschnabeltyrann
Other common names: Yellow-margined Flatbill; Zimmer's Flatbill (races E of Andes)

Taxonomy. *Rhynchocyclus assimilis* Pelzeln, 1868, Borba, Brazil.
Relationships within genus uncertain, pending completion of major genetic study. Race *flavotectus* considered by some authors to constitute a separate species on basis of disjunct distribution and vocal differences; further research required. Other races exhibit subtle variations in crown, breast and belly colours (breast becoming slightly darker in counterclockwise direction from the Guianas and NE Brazil back towards E Brazil S of Amazon (crown colour shows similar but slightly discordant pattern); further study needed on taxonomic limits within these races. Eight subspecies recognized.
Subspecies and Distribution.
T. a. flavotectus (Hartert, 1902) - E Costa Rica S to W Colombia (E to SW Bolívar and lower Cauca Valley) and NW Ecuador.
T. a. neglectus J. T. Zimmer, 1939 - E Colombia, SW Venezuela and NW Brazil (R Negro region of N Amazonas).
T. a. examinatus (Chubb, 1920) - SE Venezuela, the Guianas and NE Brazil (N bank of lower Amazon in N Pará and Amapá).
T. a. obscuriceps J. T. Zimmer, 1939 - SE Colombia (W Meta) S to NE Ecuador and NE Peru (E Loreto N of Amazon).
T. a. clarus J. T. Zimmer, 1939 - Peru (Amazonas, from just N of R Marañón, S to N Puno).
T. a. assimilis (Pelzeln, 1868) - C Brazil S of middle Amazon (from Tefé, in E Amazonas, E to R Tapajós, in W Pará).
T. a. paraensis J. T. Zimmer, 1939 - NE Brazil (E Pará, NW Maranhão).
T. a. calamae J. T. Zimmer, 1939 - SW Brazil (SE Amazonas) and N Bolivia.
Descriptive notes. 13-13·5 cm; 14·5-15 g. Big-headed, with dull white "spectacles", narrow white eyering broken in front. Nominate race has crown, nape and head side grey, tinged with olive, upperparts olive-green; wings dusky, conspicuous yellow margins on remiges and greater wing-coverts (pale panel at base of outer 3-4 primaries, faint wingbar); tail dusky; throat pale grey, becoming pale olive on breast and flanks, belly pale yellow; iris olive to dark brown; bill broad and flat, upper mandible black, lower mandible pale brownish, greyish or horn with darker tip; legs grey. Sexes similar. Juvenile resembles adult, but less grey on head, broader and less distinct margins of wing feathers tinged ochraceous. Races differ mainly in crown, breast and belly colours, but variations subtle (and crown colour varies with age): *neglectus* has olive crown, dull olive breast; *examinatus* is like previous but breast duller olive; *obscuriceps* has crown olive with a tiny bit of grey; *clarus* has sightly more grey in crown, brighter yellow belly; *calamae* has crown slightly darker than previous; *paraensis* has olive crown with only a little grey; *flavotectus* is more distinctive, differs from nominate in having discrete yellowish margins on greater wing-coverts (not forming wingbars), grey rather than olive breast. Voice. Song a leisurely series of 3-5 nasal buzzy whistles, ascending in pitch and shrill, "weeeuw weeeu weee" or "znuu znuu znuuu .znuuu-pík", given at long intervals; race *flavotectus* gives series of 3-5 similar notes, rather harsh and buzzy, with slight pause after first note, "zhweyk, zhwek-zhwek-zhwek-zhwek" (W Ecuador), "tsew, tseep tseep tseep" (Costa Rica) or "tsish, tsish tsish tsish" (Panama), typically a pause of several minutes before repeated again.



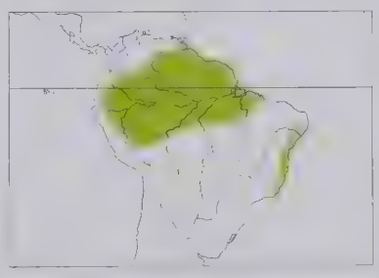
Habitat. Mid-level, subcanopy and edge of humid *terra firme*, *várzea* forest, tall second growth, and plantations; lowlands to 1000 m, locally to 1200 m on lower slopes of tepuis. Uses more mature forest than *T. sulphurescens* where the two co-occur; appears most abundant where that species is uncommon.
Food and Feeding. Diet mostly beetles (Coleoptera), worker ants (Hymenoptera), homopteran bugs (leafhoppers); small amounts of fruit (berries) taken. Stomach contents in SE Peru included 43 items, of which coleopterans 58%, hymenopteras 30% (ants 14%, wasps 16%), homopterans 5%, arachnids 5%, other 2%. Forages alone or in pairs, often joining mixed-species flocks of greenlets (Vireonidae), warblers (Parulidae) and tanagers (Thraupidae). Perches close to foliage in mid-storey and subcanopy, sometimes coming lower at edges or breaks (Costa Rica); has more horizontal posture than *T. sulphurescens*, and frequently cocks tail. Executes short upward sallies or hover-gleans to capture prey, often from undersides of leaves; occasionally pursues flushed insects. More active and noisy than *T. sulphurescens*.
Breeding. Apr-Jun in Costa Rica; nest-building in Apr in Panama; pair in breeding condition in May in Colombia. Nest a retort-like pear-shaped bag made of fine black fibres and fungal rhizomorphs, placed 9-21 m up (higher than *T. sulphurescens*), often near wasp nest. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common; probably often overlooked. Occurs in many national parks and other protected areas throughout its range, e.g. Darién National Park, in Panama, Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, Madidi and Noel Kempff Mercado National Parks and Beni Biosphere Reserve, in Bolivia, and Jaú and Tapajós National Parks, in Brazil. Much of its habitat remains in relatively pristine condition within its relatively large range. Probably locally extinct in areas where deforestation has been intense (e.g. SW Ecuador).
Bibliography. Anon. (1998a), Bates & Parker (1998), Begazo (1995), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Haverschmidt (1968), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Naka (2004), Novaes (1978a), Oren & Parker (1997), Peres & Whittaker (1991), Ridgely (1981), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Salaman (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Slud (1964), Snyder (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Tostain *et al.* (1992), Wetmore (1972), Willard *et al.* (1991), Willis (1980), Zimmer (1939c).

193. Grey-crowned Flycatcher

Tolmomyias poliocephalus

French: Platyrhynque poliocéphale **Spanish**: Picoplano Cabecigrís
German: Grauscheitel-Breitschnabeltyrann
Other common names: Grey-crowned Flatbill

Taxonomy. *Rhynchocyclus poliocephalus* Taczanowski, 1884, Nauta, Peru.
Relationships within genus uncertain, pending completion of major genetic study. Geographical boundaries of races poorly differentiated; *klagesi* possibly not a valid taxon, sometimes merged with *sclateri*; additional work required. Three subspecies tentatively recognized.
Subspecies and Distribution.
T. p. klagesi (Ridgway, 1906) - C & E Venezuela (N Amazonas, Bolívar, Delta Amacuro).
T. p. poliocephalus (Taczanowski, 1884) - SW Venezuela (S Amazonas), E & SE Colombia, E Ecuador, E Peru, and W Brazil (W Amazonas E to right bank of lower R Negro and Tefé).
T. p. sclateri (Hellmayr, 1903) - the Guianas through E Amazonian Brazil to N & C Bolivia; also isolated population in coastal E Brazil (Pernambuco S to Espírito Santo).



Descriptive notes. 12 cm; 11 g. Nominate race has small whitish supraloral stripe and faint indistinct eyering; crown and nape grey, contrasting with olive upperparts; wings blackish, wing-coverts and remiges sharply edged yellow (two yellowish wingbars, sometimes faint pale panel at base of primaries); tail dusky olive; throat greenish, breast and flanks olive, belly and vent pale yellow; iris pale yellow, pale grey or pale brown; bill broad and flat, upper mandible black, lower mandible dark with pale orange-flesh colour at base; legs grey. Sexes alike. Juvenile undescribed. Plumage differences of races quite subtle: *sclateri* differs from nominate in distinct pale grey throat, perhaps duller green back and paler yellow belly; *klagesi* appears intermediate between those two. Voice. Song a leisurely series of husky whistles that accelerate and strengthen towards end, "teeawe teeawe teeawe teeawe teeawe", at dawn repeated continuously for long periods, sometimes with interval of 1-2 seconds, at other times in a short series then a pause (Ecuador); *sclateri* a different series of 3-6 flatter, fife-like shrill "pfee" or "fwee" whistles with last 3 notes higher-pitched and inflected, reminiscent of song of Rufous-tailed Jacamar (*Galbula ruficauda*). Also in Amazonas a series of 5-15 low, soft inflected "pchoi" whistles.
Habitat. Middle and upper levels (Brazil), canopy and edge of humid *terra firme* forest, *várzea* forest and clearings; in Surinam, rather common on wooded sand ridges in coastal region, in coffee plantations, gardens, savanna forest. Mostly below 600 m, locally to 1000 m.
Food and Feeding. Recorded prey include bugs (Hemiptera) and coleopterans (of family Curculionidae). Forages singly or in pairs, usually accompanying mixed flocks of tanagers

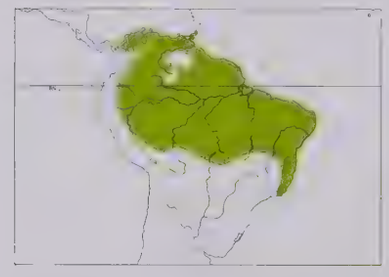
(Thraupidae), ovenbirds (Furnariidae) and other tyrannids, from middle level up to canopy tops and emergent trees; perches more horizontally than *T. sulphurescens* and with tail partially cocked, and generally forages at higher levels than that species, usually also higher than *T. assimilis* (although sometimes in same flock). Small insects taken in upward-strike and hover-glean manoeuvres.
Breeding. Nests found in Jan and Jun in SE Colombia. Nest a hanging bag-like structure suspended 2-25 m above ground, often near wasp (Hymenoptera) nest. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to common; often overlooked. Occurs in many national parks and other protected areas throughout its range, e.g. Tinigua National Park, in Colombia, Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, Madidi and Noel Kempff Mercado National Parks and Pilón Lajas Biosphere Reserve, in Bolivia, and Jaú and Tapajós National Parks, in Brazil. Has relatively large range within which much of its habitat remains in relatively good condition.
Bibliography. Bates & Parker (1998), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Dunning (1992), Friedmann (1948), Gilliard (1941), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Naka (2004), Oren & Parker (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Roda & Carlos (2003), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Zimmer (1939c).

194. **Yellow-breasted Flycatcher**

Tolmomyias flaviventris

French: Platyrhynque à poitrine jaune **Spanish**: Picoplano Pechiamarillo
German: Gelbbauch-Breitschnabeltyrann
Other common names: Yellow-breasted Flatbill; Ochre-lored Flycatcher (N & E races *aurulentus*, *dissors* and *flaviventris*); Olive-faced Flycatcher (W Amazonian races *viridiceps*, *zimmeri* and *subsimilis*)

Taxonomy. *Muscipeta flaviventris* Wied, 1831, southern Bahia, Brazil.
Relationships within genus uncertain, pending completion of major genetic study. W Amazonian races (*viridiceps*, *zimmeri*, *subsimilis*) sometimes treated as a separate species on grounds of plumage and vocal differences. Taxonomic limits of all races, however, poorly delineated. Named taxon *borbae*, from Borba (R Madeira, in Brazil), considered an intergrade between *viridiceps* and nominate; *collingwoodi*, described from Trinidad, included within *aurulentus*. Six subspecies recognized.
Subspecies and Distribution.
T. f. aurulentus (Todd, 1913) - E Panama, N & E Colombia, N & C Venezuela, Trinidad and Tobago, the Guianas and N Brazil (R Branco E to N Pará and Amapá).
T. f. dissors J. T. Zimmer, 1939 - SW Venezuela and NE Brazil (N Pará near R Jamundá, and from W of R Tapajós E to R Tocantins and Marajó I).
T. f. flaviventris (Wied, 1831) - E Brazil S of Amazon (Maranhão S to Mato Grosso and Espírito Santo) and E Bolivia (NE Santa Cruz).
T. f. viridiceps (P. L. Sclater & Salvin, 1873) - SE Colombia, E Ecuador, E Peru and W Amazonian Brazil.
T. f. zimmeri Bond, 1947 - N & C Peru (San Martín S to Junín).
T. f. subsimilis Carriker, 1935 - SE Peru, SW Brazil and NW Bolivia.



Descriptive notes. 12-12·7 cm; 11·3 g. Distinctive. Nominate race is uniform yellowish-olive above, supraloral area and narrow eyering brighter and tinged ochre; wings and tail dusky, two yellowish wingbars, yellowish margins of remiges; bright yellow below, olive wash on throat and breast, paler on belly; iris dark brown to greyish-brown; bill broad and flat, usually all dark, sometimes paler base of lower mandible; legs blue-grey. Differs from congeners in brighter and yellower plumage, no grey in crown. Sexes similar. Juvenile resembles adult. Race *dissors* is slightly smaller than nominate; *aurulentus* is darker, yellow areas richer; *viridiceps* is duller olive and darker above, yellow or ochre tinge in face reduced or lacking, more olive on breast, has dark bill with pinkish base of lower mandible; *zimmeri* and *subsimilis* resemble last. Voice. Song ("nominate group") 3-5 loud penetrating "sweep" or "shreeeép" whistles, typically in sequences of three in Tobago, two in Trinidad, with pause of several seconds between notes; call a single "sweep". Call in W Amazonia ("*viridiceps* group") a faster series of 3-4 rising "cheeyp" notes.
Habitat. Widespread in dry to humid forest, woodland borders, shrubby areas, gallery forest, clearings, *restinga*, *caatinga*; in Amazonia mainly in riparian growth and *várzea* forest edge, with smaller numbers in *terra firme* forest. Also mangroves in Trinidad and the Guianas, and coffee plantations and gardens in Surinam. Lowlands to 1000 m.
Food and Feeding. Diet arthropods; also berries (Trinidad and Tobago). Recorded prey include coleopterans (of family Curculionidae), bugs (Hemiptera, including heteropterans) and craneflies (Tipulidae); stomach contents in SE Peru included 32 items, of which coleopterans 59%, hymenopterans 38% (ants 22%, wasps 16%), arachnids 3%. Forages alone or in pairs, mostly inside upper canopy of trees, sometimes quite low; sometimes joins mixed-species flocks, although often occurs in lightly wooded areas where mixed flocks do not form. Perches erect while searching for prey. Uses upward sally-strikes and sally-gleaning and hover-gleaning manoeuvres to seize prey from twigs or from undersides of leaves, afterwards dropping down to new perch; snaps mandibles audibly on capture.
Breeding. Apr-Jun in N Colombia, May-Sept in Venezuela (Apure, Guárico) and Trinidad, and May-Jun in Tobago. Nest, built by only one member of pair, a pear-shaped bag made from rootlets and fibres (black in most areas, pale in others), downward-facing entrance tube protruding from bottom on one side, suspended from thin branch often high up, often near wasp nest. Clutch 2-3 eggs; nestlings fed by both parents; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Widespread and fairly common to common. Especially common in Trinidad and Tobago, where this species occupies virtually all forest habitats; particularly numerous on Tobago. Recently reported from E Panama. Occurs in many national parks and other protected areas throughout its large range. Able to thrive in wide variety of wooded habitats, including converted ones.
Bibliography. Bates & Parker (1998), Bates *et al.* (1992), Begazo (1995), Buzzetti (2000), Carriker (1935), Chapman (1917c), Clements & Shany (2001), Cory & Hellmayr (1927), Dubs (1992), ffrench (1991), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes & Samad (2002), Herklots (1961), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Oren & Parker (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Schubart *et al.* (1965), Schulenberg *et al.* (2001), Sick (1993, 1997), Silveira *et al.* (2003), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992), Traylor (1977), Wetmore (1939), White (2002), Zimmer (1939c).

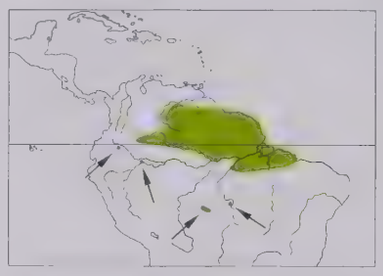
Genus *PLATYRINCHUS* Desmarest, 1805

195. **Cinnamon-crested Spadebill**

Platyrinchus saturatus

French: Platyrhynque à cimier orange **Spanish**: Picoplano Cresticanela
German: Zimtkopf-Breitschnabeltyrann

Taxonomy. *Platyrhynchus saturatus* Salvin and Godman, 1882, Merumé Mountains, Guyana.
Relationships within genus unclear, pending completion of major genetic study. Taxonomic limits of races uncertain; vocal differences reported between populations N and S of Amazon; additional research required. Two subspecies recognized.
Subspecies and Distribution.
P. s. saturatus Salvin & Godman, 1882 - S Venezuela (Amazonas, Bolívar), the Guianas, E Colombia (Vaupés, probably more widespread), N Brazil (upper R Negro, and from N Pará E to Amapá); and very locally NE Ecuador (N Sucumbíos) and NE Peru (Loreto).
P. s. pallidiventris Novaes, 1968 - Brazil S of Amazon, from lower R Tapajós E to N Maranhão, also locally in Mato Grosso (Alta Floresta) and E Rondônia.



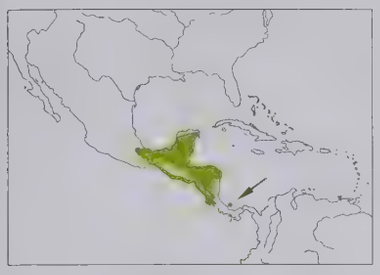
Descriptive notes. 9·1-9·5 cm; 8·8-15 g, mean 10·6 g. Small, dull brownish spadebill with buffish-white supraloral spot and inconspicuous eyering. Nominate race has dark rufous-brown head with semi-concealed orange-rufous coronal patch; upperparts dark rufous-brown, wings similar, prominent dusky patch at base of primaries, remiges edged rufescent; white throat contrasts with olive-brown wash on breast and sides, and yellower belly; iris brown; bill broad and flat, black; legs pale pinkish-flesh. Sexes alike. Juvenile undescribed. Race *pallidiventris* has posterior crown feathers more orange-yellow than nominate, breast more olive, belly brighter yellow. Voice. Song (S of Amazon) a series of 3-6 notes, "ka-knee-knee-knee-knee", given in slow rattling or pulsating bursts; call (E Venezuela and Guyana) a distinct, sharp and nasal "chip-it"or "squik-ik", sometimes only the first note given.
Habitat. Undergrowth of *terra firme* forest, where it prefers areas of brushy undergrowth or dense stands of saplings; in W Amazonia, perhaps restricted to forests on sandy or other nutrient-poor soils, especially in black-water areas. Recorded up to 900 m.
Food and Feeding. Eats small arthropods. Reported as sometimes attending mixed-species understorey flocks, including those following swarms of army ants; also seen foraging in pairs. Forages by sitting still on low perch 1·5-3 m above ground in dense vegetation, scanning for prey; then either suddenly moves to new perch, or uses rapid upward-sally manoeuvres to scoop prey from undersides of leaves, after which it continues without pause to a new perch.
Breeding. No information available.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally uncommon to rare; perhaps often overlooked, as difficult to locate. Further fieldwork required in order to confirm true status; for example, considered widely distributed and not uncommon in Surinam.
Bibliography. Álvarez & Whitney (2003), Blake (1950), Clements & Shany (2001), Cory & Hellmayr (1927), Dunning (1993), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Meise (1954), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Novaes (1978a), Oren & Parker (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Sick (1993, 1997), Snyder (1966), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Stouffer & Bierregaard (1995), Thiollay (1994), Thiollay & Jullien (1998), Tostain *et al.* (1992), Willard *et al.* (1991), Zimmer, J.T. (1939b), Zimmer, K.J. & Hilty (1997), Zimmer, K.J. *et al.* (1997).

196. **Stub-tailed Spadebill**

Platyrinchus cancrominus

French: Platyrhynque à queue courte **Spanish**: Picoplano Rabón
German: Kurzschwanz-Breitschnabeltyrann
Other common names: Mexican Spadebill

Taxonomy. *Platyrhynchus cancrominus* P. L. Sclater and Salvin, 1860, Choctum, Guatemala.
Relationships within genus unclear, pending completion of major genetic study. Has sometimes been considered conspecific with *P. mystaceus*, but the two behave as separate species in Costa Rica. Birds from Yucatán Peninsula sometimes separated as race *timothei* and those from El Salvador S to NW Costa Rica as race *dilutus*, but poorly differentiated from other populations; additional work required in order to assess taxonomic status of these forms. Treated as monotypic.
Distribution. SE Mexico (from S Veracruz, Tabasco, Chiapas and Yucatán Peninsula) S to Nicaragua and W Costa Rica; recently found also in NW Panama (Bocas del Toro Archipelago).
Descriptive notes. 9·9·5 cm; 10-12 g. Male has bold facial pattern created by pale yellow supraloral patch, eyering, auricular patch below eye and arching postocular stripe, contrasting with dark blackish-brown lores, stripe beneath front of eye and patch on rear auriculars (in front of pale postocular stripe); crown and side of head greyish-brown, semi-concealed yellow coronal patch; upperparts olive-brown; wings dusky, feathers with cinnamon-brown edgings; tail small, stubby, brown; throat white, contrasting with tawny-buff or brown breast, pale yellow belly and undertail-coverts; iris dark; bill broad and flat, upper mandible black, lower mandible pale flesh-coloured; legs flesh-pink. Female lacks yellow coronal patch. Juvenile has facial pattern less distinct, yellow coronal patch lack-



ing, browner above with dark feather fringes, fulvous wingbars, pale greyish-buff throat and breast shading to white on belly. Voice. Dawn song a nasal, rapid, rolled trill alternated with sharp calls, "ki-di-di-di-rrril, ki-di-di-di-drri-l-l sy-iik"; call a sharp nasal twitter of 2-3 notes, "ki-dih" or "ki-dih-dih", also a rolled nasal trill, "pirrrirrr"; partners frequently call back and forth to each other.

Habitat. Low to middle levels of shady understorey in humid evergreen forest, semi-deciduous forest, gallery forest and dry forest; sea-level to 1300 m (Costa Rica), in Mexico to 1500 m.

Food and Feeding. Diet includes homopteran bugs, ants (Hymenoptera), beetles (Coleoptera), spiders (Araneae); indirect evidence of fruit consumption in Mexico. Forages alone or in pairs; not known to attend mixed flocks, but reported as foraging at swarms of army-ants (*Eciton burchelli*) in Mexico (Los Tuxtlas). Forages from ground or low perches, scanning surrounding foliage; uses rapid upward-sally manoeuvres to scoop prey from undersides of leaves or twigs; sometimes searches leaf litter on ground, without manipulating leaves.

Breeding. May in Costa Rica. Nest a cone-shaped thin-walled cup constructed from fine grasses, bark strips and bits of leaves, lined with black fungal rhizomorphs, placed firmly in vertical fork of understorey shrub. Clutch 2 eggs; no information on incubation and fledging periods.

Movements. Resident.

Status and Conservation. Not globally threatened. Common to fairly common in Mexico and Bocas del Toro in Panama, uncommon and local in Costa Rica; fairly common in Panama, where it was found on all six of the larger islands at entrance of Laguna de Chiriquí. Occurs in several protected areas, including Río Bravo Conservation and Management Area, Columbia River Forest Reserve and Lamanai Archaeological Reserve, in Belize, and Tarcol Lodge, Carara Biological Reserve and Río Negro Jaguar Reserve, in Costa Rica.

Bibliography. Anon. (1998a), Binford (1989), Brodkorb (1943), Coates-Estrada & Estrada (1989), Cory & Hellmayr (1927), Dearborn (1907), Gómez de Silva *et al.* (1999), González-García (1993), Herrera *et al.* (2003), Howell & Webb (1995a), Kricher & Davis (1992), Land (1970), Lee Jones (2004), Lowery & Dalquest (1951), Meise (1954), Monroe (1968), Olson (1993), Paynter (1957), Ridgely & Gwynne (1989), Ridgway (1907), Rowley (1984), Slud (1964, 1980), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Thurber *et al.* (1987), Wetmore (1943, 1944).

197. White-throated Spadebill

Platyrinchus mystaceus

French: Platyrhynque à moustaches **Spanish**: Picoplano Bigotudo
German: Gelbscheitel-Breitschnabeltyrann
Other common names: Yellow-crested Spadebill ("nominate group")

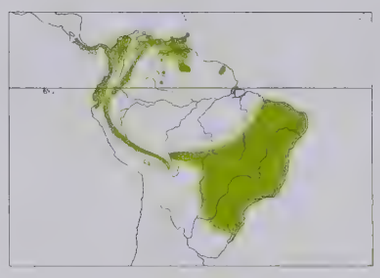
Taxonomy. *Platyrhynchos mystaceus* Vieillot, 1818, Paraguay.

Relationships within genus unclear, pending completion of major genetic study. Has sometimes been considered conspecific with *P. cancrominus*, but the two behave as separate species in Costa Rica. Races fall into two different types, the Central American-Andean "*albogularis* group" (including *perijanus* and *zamorae*) and the "nominate group" of lowlands (E from N Venezuelan *insularis* and tepui races and from N Bolivia); *partridgei* apparently intermediate between the two. Further work necessary in order to clarify taxonomic limits of these groups, as well as relationships within and between races with dark lower mandible (former group) and those with pale lower mandible ("nominate group"). Specimen from N Bolivia (Trinidad, in Beni) may belong to race *bifasciatus*, thus extending latter's range far to W. Fourteen subspecies recognized.

Subspecies and Distribution.

P. m. neglectus (Todd, 1919) - Costa Rica, Panama, N & C Colombia (R Truandó, Santa Marta region, Boyaca) and NW Venezuela (W Táchira).
P. m. perijanus Phelps, Sr & Phelps, Jr, 1954 - Sierra de Perijá, on Colombia-Venezuela border.
P. m. albogularis P. L. Sclater, 1860 - W Colombia (Pacific slope of W Andes, Cauca Valley, head of Magdalena Valley) and W Ecuador.
P. m. zamorae (Chapman, 1924) - E Ecuador S along Andes to SE Peru (S to W Madre de Dios).
P. m. partridgei Short, 1969 - extreme SE Peru (S Puno) and W & C Bolivia (La Paz, Cochabamba, SW Santa Cruz).
P. m. insularis J. A. Allen, 1889 - N Venezuela (Falcón and Lara E to Sucre, and Orinoco Valley from NW Bolívar E to Delta Amacuro), Trinidad and Tobago, and locally in W Guyana and French Guiana.
P. m. imatacae J. T. Zimmer & Phelps, Sr, 1945 - Sierra de Imataca, in NE Bolívar (E Venezuela).
P. m. ptaritepui J. T. Zimmer & Phelps, Sr, 1946 - Sororopán-tepui, Ptari-tepui and Aprada-tepui, in SE Bolívar (SE Venezuela).
P. m. duidae J. T. Zimmer, 1939 - S & SE Venezuela (Cerros Yaví, Duida and Roraima) and extreme N Brazil (N R Branco).
P. m. ventralis Phelps, Sr & Phelps, Jr, 1955 - extreme S Venezuela (Cerro de la Neblina) and adjacent NW Brazil.
P. m. bifasciatus J. A. Allen, 1889 - S Brazil (C Mato Grosso E to C Goiás), possibly also N Bolivia (Beni).
P. m. mystaceus Vieillot, 1818 - SE Brazil (S Mato Grosso, C Paraná and W Santa Catarina S to Rio Grande do Sul), E Paraguay and NE Argentina (Misiones, Corrientes).
P. m. cancromus Temminck, 1820 - E Brazil (interior Maranhão E to Ceará and N Bahia, S to E Paraná and E Santa Catarina).
P. m. niveigularis Pinto, 1954 - coastal forests of NE Brazil (Paraíba S to Alagoas).

Descriptive notes. 9·5-10 cm; 8·1-12 g. Small, big-headed and stub-tailed spadebill with bold facial pattern. Male nominate race has pale buff-yellow supraloral patch, eyering, auricular patch below eye and arching postocular stripe, contrasting with dark blackish-brown lores, stripe beneath front of eye and patch on rear auriculars (in front of pale postocular stripe); dark olive-brown on crown, semi-concealed yellow coronal patch; upperparts, wings and stubby tail olive-brown; throat whitish or pale yellow, underparts creamy buff to ochraceous, sometimes washed tawny to olive on breast and sides, belly tinged ochre; iris dark; bill broad and flat, upper mandible black, lower mandible pale; legs pale flesh-coloured or grey. Female is similar to male, but coronal patch small or absent. Juvenile lacks yellow coronal patch, is brighter and more rufescent above, throat and breast pale greyish-brown, belly buffish-white. Race *cancromus* is very similar to nominate; *niveigularis* has pure white throat; *insularis* differs from nominate in being more greenish-olive (less brownish) above, paler and whiter on belly, with more distinct olive-buff breastband; *duidae*



is like previous, but darker upperparts, more ochre-tinged underparts; *ptaritepui* has paler crown patch, all-dark bill; *ventralis* has brighter yellow coronal patch, much darker ochre underparts; *imatacae* has grey-tinged crown, paler underparts, breast yellowish-buff, abdomen yellowish-white; *bifasciatus* is larger than nominate, strongly greenish above, with distinct wingbars, buffy yellow below; *albogularis* differs from nominate in having dark lower mandible with pale tip, more pure white throat contrasting more with breast, whiter belly; *neglectus* and *zamorae* are similar to last; *perijanus* differs from previous in olivaceous (instead of brownish) upperparts; *partridgei* is essentially intermediate in plumage between "nominate group" and "*albogularis* group", but has all-dark bill as in latter. Voice. Song a high, thin, rattling trill, "pe'e'e'e'e'e'e'e'e'e'eet", rising slightly and then descending, sometimes preceded by abrupt "squek" note; frequently heard call a short and sharp "squeep", sometimes doubled or given in a series. Wing-whir like that of a manakin (Pipridae) during flight display.

Habitat. Undergrowth of a variety of habitats, including humid lowland and montane forests, dry forest, gallery forest, tall secondary woodland; sometimes in tangled brushy areas or bamboo thickets along forest borders. Sea-level to 2150 m; 700-2150 m in Costa Rica, 750-1800 m in Panama, 900-2000 m in Colombia, 1000-2000 m on E slope of Andes in Ecuador, and 600-2000 m on W slope in Ecuador and E slope in Peru.

Food and Feeding. Arthropods. Stomach contents in SE Peru included 32 prey items, of which beetles (Coleoptera) 46%, hymenopterans 15% (ants 6%, wasps 9%), bugs (Hemiptera) 12%, arachnids 9%, orthoptera 6%, homopterans 6%, other 6%. Occurs in pairs, with individuals well separated; generally does not join mixed-species flocks, but reported to do so in gallery forest in Venezuelan *llanos* and in second-growth forest in Brazil (Rio de Janeiro). Perches 0·3-5 m up in dense undergrowth for long periods, scanning surrounding foliage, or changes perch; uses rapid upward-sally manoeuvres to scoop prey from undersides of leaves or twigs, capture accompanied by audible bill-snap.

Breeding. Mar-May in Costa Rica, May-Jul in N Colombia and Dec in E; May-Jul in Trinidad, Jun in Tobago. Male, when excited, sings with yellow feathers of coronal patch erected in a fan; has flight display accompanied by wing-whir. Nest in Costa Rica a smooth cone-like cup of black fungal fibres, pale fibres, and dead leaves that drape below bottom, and fragment of snakeskin; in Trinidad a deep cup of dead grasses and pale fibres bound with cobweb, lined with black fibres; placed 1-3 m (in Trinidad 0·5-0·7 m) above ground in upright fork of shrub or sapling. Clutch 2 eggs; no information on incubation and fledging periods.

Movements. Resident.

Status and Conservation. Not globally threatened. Common to fairly common, but perhaps less numerous at higher altitudes of range; often overlooked unless mist-netted. Occurs in many national parks and other protected areas throughout its rather large range. Has possibly suffered from deforestation in lowlands.

Bibliography. Anon. (1998a), Begazo (1995), Bond *et al.* (1989), Brooks *et al.* (1993), Canevari *et al.* (1991), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Davis (1945, 1946), Davies *et al.* (1994), ffrench (1991), Hayes (1995), Hayes & Samad (2002), Hilty (1997, 2003), Hilty & Brown (1986), Lowen *et al.* (1996), Meise (1954), Meyer de Schauensee & Phelps (1978), Miller (1963), Narosky & Salvador (1998), de la Peña (1988), Pople *et al.* (1997), Remsen *et al.* (1991), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), do Rosário (1996), Salaman (1994), Short (1969), Sick (1993, 1997), Silveira *et al.* (2003), Slud (1964), Snow (1985a), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Terborgh & Weske (1975), Thiollay (1994), Tostain *et al.* (1992), Wetmore (1972), White (2002), Williams & Tobias (1994), Zimmer (1930, 1939b).

198. Golden-crowned Spadebill

Platyrinchus coronatus

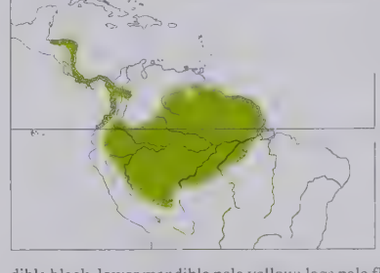
French: Platyrhynque à tête d'or **Spanish**: Picoplano Coronado
German: Goldkappen-Breitschnabeltyrann

Taxonomy. *Platyrhynchus coronatus* P. L. Sclater, 1858, River Napo, Ecuador.

Relationships within genus unclear, pending completion of major genetic study. True taxonomic status of races uncertain; further research required. Three subspecies recognized.

Subspecies and Distribution.

P. c. superciliaris Lawrence, 1863 - Honduras S to N & W Colombia (Caribbean lowlands, N base of Andes to middle Magdalena Valley in W Santander, and Pacific lowlands) and NW Ecuador (S to Manabí).
P. c. coronatus P. L. Sclater, 1858 - S Venezuela (Amazonas), SE Colombia (S from W Caquetá and NE Amazonas) and E Ecuador s to E Peru (S Loreto, E Pasco), NW & W Brazil (upper R Negro and, S of Amazon, E to R Xingu area and S to NW Mato Grosso) and N Bolivia (S to La Paz).
P. c. gumia (Bangs & T. E. Penard, 1918) - SE Venezuela (C & E Bolívar), the Guianas and adjacent N Brazil (upper R Branco E to Amapá).



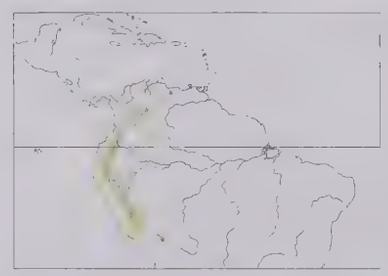
Descriptive notes. 8·5-9 cm; 8-9 g. Small spadebill with bold facial pattern, prominent rictal bristles. Has pale buff-yellow (or olive-tinged) supraloral band, eyering, auricular patch below eye and arching postocular stripe, which contrast with dark blackish-brown lores, stripe beneath front of eye and rear auricular patch (in front of pale postocular stripe); rest of head olive, broad orange-rufous on crown bordered laterally with black, semi-concealed yellow coronal patch; upperparts, wings and tail olive; throat pale whitish-yellow, underparts pale yellow, olive wash or streaks on breast; iris dark; bill broad and flat, upper mandible black, lower mandible pale yellow; legs pale flesh-coloured. Sexes similar, but female's coronal patch more orange. Juvenile has paler facial markings and underparts, entirely brownish-olive crown, greyish-olive upperparts, ochraceous-tinged edges of wing-coverts and remiges. Races all very similar; *superciliaris* has brighter yellow underparts than nominate; *gumia* is slightly smaller than others, has brighter yellow belly. Voice. Song a quiet insect-like trill, "se'e'e'e'e'e'r'r'r'r'r'e'e'e" or "bzee-eee-eéep", descends in pitch slightly in middle and then rises at end, 1-3 sharp "pip" notes

sometimes added; call an insect-like chirp (like that of an orthopteran), repeated 2-3 times. Also audible mechanical wing-whir in display-flight.
Habitat. Dark understorey of humid forest (both *terra firme* and *várzea*) and adjacent tall second growth, in lowlands and foothills. Mainly below 500 m, but recorded to 700 m on Caribbean slope and to 1200 m on Pacific slope of Costa Rica, to 1500 m in Venezuela and to 1650 m in C Ecuador.
Food and Feeding. Diet includes beetles (Coleoptera), caterpillars, small grasshoppers (Orthoptera), spiders (Araneae), and other small arthropods. Occur in pairs throughout year; in Costa Rica frequently joins mixed-species understorey flocks, but rarely seen to accompany swarms of army ants. Forages by perching 1-5 m up in open shady understorey, scanning surrounding foliage for prey; makes rapid upward-sally manoeuvres for short to long distances (to c. 10 m) from perch, scooping prey from undersides of leaves or twigs.
Breeding. Apr-Jun in Costa Rica and Jul in Panama; in Colombia, Jan-Apr in NW and Aug in SE. Makes short display-flights between perches, accompanied by audible wing-whirs. Nest a cup of plant fibres, tree-fern scales and fungal rhizomorphs, bound by spiderweb, lined with fine fibres, outside decorated with moss and spider egg cases, sometimes with messy "tail" of debris, nest cup somewhat reminiscent of that of a hummingbird (Trochilidae); placed 1-4 m up in upright fork of shrub or sapling. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common or locally common; probably often overlooked. Occurs in many national parks and other protected areas throughout its range, e.g. from Tarcol Lodge and Río Negro Jaguar Reserve, in Costa Rica, and Darién National Park, in Panama, S to Beni and Pilón Lajas Biosphere Reserves, in Bolivia. Studies at Manaus, in Brazil, have shown that forest fragmentation has negative effects on the species' population density. Probably locally extinct wherever deforestation has been intense, e.g. in lowlands of W Chiriquí, in Panama; may have disappeared also from the small Río Palenque Science Centre, in Ecuador. On the other hand, much suitable habitat remains in relatively good condition within its large range.
Bibliography. Anon. (1998a), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Karr & Freemark (1983), Karr *et al.* (1990), Meise (1984), Meyer de Schauensee & Phelps (1978), Monroe (1968), Oren & Parker (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), Salaman (1994), Sherry (1984), Sick (1993, 1997), Skutch (1960, 1985), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Stouffer & Bierregaard (1995), Terborgh *et al.* (1990), Thiollay (1994), Tostain *et al.* (1992), Wetmore (1972), Willis (1980), Zimmer (1930, 1939b).

199. **Yellow-throated Spadebill**
Platyrinchus flavigularis

French: Platyrhynque à gorge jaune **Spanish**: Picoplano Gorgiamarillo
German: Gelbkehl-Breitschnabeltyrann

Taxonomy. *Platyrhynchus flavigularis* P. L. Sclater, 1862, Nova Granada, "Bogotá" = Albán, Cundinamarca, Colombia.
Relationships within genus unclear, pending completion of major genetic study. Distribution apparently very patchy but little known, and degree of disjunction uncertain; further work required in order to confirm true taxonomic status of races. Two subspecies recognized.
Subspecies and Distribution.
P. f. vividus Phelps, Sr & Phelps, Jr, 1952 - W Venezuela (Sierra de Perija, Andes of SE Lara and SE Táchira; probably also coastal cordillera in SE Carabobo).
P. f. flavigularis P. L. Sclater, 1862 - E Andes of Colombia (W side in W Cundinamarca and Huila), E Ecuador (E slope from W Napo S to Zamora-Chinchipe) and E Peru (N Amazonas S to Cordillera Vilcabamba, in Cuzco).

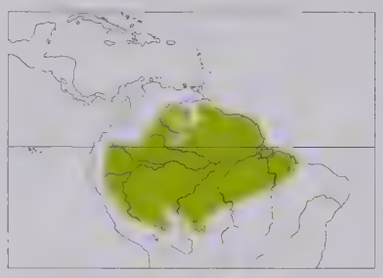


Descriptive notes. 9·5-10·2 cm. Has bright rufous-brown head, yellowish loral spot, large white coronal patch (semi-concealed) with black feather tips (not visible in the field); upperparts olive, duskier on wings and stubby tail; pale yellow below, brightest on throat, smudgy olivaceous breastband; iris dark; bill broad (11 mm) and flat, blackish above, pale below (turning bright yellow towards base); legs flesh-pink. Sexes alike. Juvenile undescribed. Voice. Call a sharp "peeeyr", slowly repeated at intervals of 4-5 seconds.
Habitat. Undergrowth of montane forest. In Ecuador favours areas with relatively open understorey, especially on ridges where soil thin and vegetation less developed. Recorded at 1250-2100 m in Venezuela, 1800-2300 m in Colombia, 750-1700 m in Ecuador.
Food and Feeding. Little known. Diet probably arthropods. Difficult to observe; often perches motionless in the open for extended periods.
Breeding. Birds in breeding condition in Apr-Jun in Venezuela. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare to uncommon and local throughout most of range; perhaps often overlooked. Possibly locally fairly common in Venezuela (W Zulia); record from SE Carabobo requires verification. Rare and apparently declining in Colombia. Few records from Ecuador, where it may be "near-threatened". Rare in Peru. Conservation status probably merits re-assessment.
Bibliography. Canaday (2002a), Chapman (1917c), Clements & Shany (2001), Cory & Hellmayr (1927), Davies *et al.* (1994), Hilty (2003), Hilty & Brown (1986), Meise (1954), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Rasmussen *et al.* (1996), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robbins *et al.* (1987), Schulenberg *et al.* (2001), Stotz *et al.* (1996), Zimmer (1930).

200. **White-crested Spadebill**
Platyrinchus platyrhynchos

French: Platyrhynque à cimier blanc **Spanish**: Picoplano Crestiblanco
German: Silberkopf-Breitschnabeltyrann

Taxonomy. [*Todus*] *platyrhynchos* J. F. Gmelin, 1788, locality unknown, possibly Surinam.
Relationships within genus unclear, pending completion of major genetic study. Additional work needed in order to clarify taxonomic limits of races. Four subspecies recognized.
Subspecies and Distribution.
P. p. platyrhynchos (J. F. Gmelin, 1788) - E Colombia (E Guainía and E Vaupés, probably also E Vichada), S Venezuela (Amazonas, Bolívar), the Guianas, and N Amazonian Brazil (upper R Negro E to R Branco and N Pará).
P. p. senex P. L. Sclater & Salvin, 1880 - E Ecuador, E Peru, extreme W Brazil (R Juruá) and N Bolivia (S to La Paz, SW Beni, and NE Santa Cruz).
P. p. nattereri Hartert & Hellmayr, 1902 - SC Amazonian Brazil, from lower R Purús E to upper R Madeira and R Jiparaná (E Amazonas).
P. p. amazonicus Berlepsch, 1912 - E Amazonian Brazil S of Amazon, from left bank of R Tapajós E to N Maranhão.

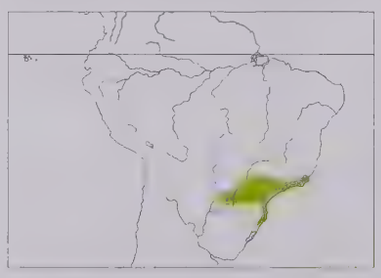


Descriptive notes. 10·5-11·5 cm; 11·5-13 g. Large-headed, stub-tailed flycatcher; bill extremely broad (12 mm), broadest of genus. Nominate race has grey head, darker on crown and paler on side, with semi-concealed white coronal patch, pale buffy supraloral spot; contrasting russet-brown upperparts; wings and tail dusky brown; throat white, breast and belly uniform bright ochraceous; iris dark; bill very broad and flat, upper mandible black, lower mandible pale; legs pinkish-yellow. Sexes similar, female with white coronal patch smaller than male's. Juvenile undescribed. Race *senex* is similar to nominate, but crown somewhat paler, brown of upperparts less rich and less dark; *nattereri* has slightly paler and yellower belly; *amazonicus* has ochraceous colour of underparts not so bright and more restricted to breast, with belly much paler and yellower than nominate. Voice. Song a thin buzzy or burry trill that ascends and then descends in pitch, e.g. as "pr're're'e'e'e'e'é'é'é''r'r'r'r'r'r'r" or "bree-ee-ee-ee-ee-ee-ee-ee-cuw", sometimes with sharp "squek" note at end; most frequent call, given from open perch, a sharp, loud and explosive "skeeuw" or "péép", sometimes repeated at intervals of 1-5 seconds and reminiscent of a *Sclerurus* leaftosser (Furnariidae). Also mechanical wing-whir, like that of a manakin (Pipridae), during display-flight.
Habitat. Open understorey of humid *terra firme* forest; most numerous in forests on sandy soils. Mostly below 500 m, but recorded to 900 m in Peru.
Food and Feeding. Small arthropods; bugs (Hemiptera), including homopterans of family Fulgoridae, recorded in diet in Surinam. Occurs in pairs; not seen to attend mixed-species flocks, but seems to be more active in their midst. Forages by sitting still on perch 2-5 m up (somewhat higher and in more open areas than congeners) above dense vegetation; then either makes rapid upward-sally manoeuvres to scoop prey from undersides of leaves, after which it continues without pause to a new perch, or suddenly moves to new perch over 1 m away.
Breeding. Recorded (without specific details) in Nov in Surinam; male in breeding condition in May in SE Colombia. Display-flight between perches at steep downward angle, accompanied by mechanical wing-whirring. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally rare throughout most of range, but could be overlooked; local in NW Amazonia, and uncommon to locally fairly common in Venezuela. Few records from E Ecuador. Occurs in several national parks and other protected areas, e.g. near Kapawi and La Selva Lodges, in Ecuador, and in Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, Noel Kempff Mercado National Park, in Bolivia, and Jaú and Tapajós National Parks, in Brazil. Although this is in general a scarce species, much of its habitat remains in relatively undisturbed condition.
Bibliography. Allen (1995), Bates & Parker (1998), Clements & Shany (2001), Cory & Hellmayr (1927), Descourtilz (1983), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Meise (1954), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Olivares (1964), Oren & Parker (1997), Peres & Whittaker (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Stouffer & Bierregaard (1995), Terborgh *et al.* (1990), Tostain (1980), Tostain *et al.* (1992), Willard *et al.* (1991).

201. **Russet-winged Spadebill**
Platyrinchus leucoryphus

French: Platyrhynque à ailes rousses **Spanish**: Picoplano Alirrufo
German: Rostflügel-Breitschnabeltyrann

Taxonomy. *Platyrinchos leucoryphus* Wied, 1831, Itapemirim, Espírito Santo, Brazil.
Relationships within genus unclear, pending completion of major genetic study. Monotypic.
Distribution. SE Brazil (Paraná and São Paulo E to C Espírito Santo, S to NE Santa Catarina and Rio Grande do Sul) and adjacent E Paraguay (Canindeyú S to Paraguarí, Caazapá and Itapúa) and extreme NE Argentina (Iguazú National Park, in N Misiones).



Descriptive notes. 12·5 cm; 17 g. Largest spadebill. Has olive-brown crown with semi-concealed white coronal patch; bold facial pattern created by pale buff-white to yellowish supraloral spot, eyering, auricular patch below eye and arching postocular stripe, contrasting with dark brown lores, stripe beneath front of eye and rear auricular patch (in front of pale postocular stripe); upperparts olive-brown; wings brown, wing-coverts and remiges broadly edged russet; tail long, brown; throat white, contrasting olive-brown wash on breast and sides, dull yellow or white belly; iris dark brown; bill broad and flat, upper mandible black with yellow edges, lower mandible yellow; legs pale orange to flesh-coloured. Sexes similar. Juvenile undescribed. Voice. Song a weak, thin, buzzy trill, "bzee-eee-eép", pattern similar to that of *P. mystaceus*; call a loud "ééo", similar to that of *Leptopogon amaurocephalus*.
Habitat. Undergrowth of humid forest and medium levels of mature second growth, both in coastal mountains and lowlands and in interior tableland forests; in Paraguay, seems to prefer forest having many small saplings and lianas for perching, but a shady open understorey. Recorded up to at least 1000 m.
Food and Feeding. Eats small arthropods. Adult seen to take green katydids (Tettigoniidae), and nestlings observed while being fed with katydids, cockroaches (Blattodea), moths (Lepidoptera)

and spiders (Araneae). Usually solitary; one record of an individual attending mixed-species flock in forest undergrowth in Brazil. Sits still on perch in crown of small tree (3-8 m), scanning surrounding foliage for prey; then either suddenly moves to new perch, or uses rapid upward-sally or diagonal-sally manoeuvres to scoop prey from undersides of leaves, after which it continues without pause to a new perch.

Breeding. Sept-Nov. Cup-shaped nest, outer wall composed of fragments of dry leaves (bamboo leaves in Paraguay) interwoven with fibrous lichens, exterior "decorated" with small pieces of bark or white silk (probably from spider's web), suspended "tail" of fibrous lichens and bamboo leaves, neatly woven inner wall of fibrous lichens with lining of semi-decomposed small leaves, or completely lined with black fungal rhizomorphs; external diameter 6 cm, depth 4 cm (not including pendant dry leaves); placed 2·5-4·5 m above ground in fork of small sapling. Clutch 2 eggs; no information on incubation and fledging periods; at one nest with two chicks, these were fed 2·9 meals/nestling/hour.

Movements. Resident.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Rare, and possibly local. Formerly listed as Vulnerable; recent change in conservation status based on accounts of an apparent tolerance of second growth, and apparent increase in records following improved knowledge of its vocalizations. Recent surveys in Paraguay, however, have failed to find new populations of the species, and documented populations are now known to be less extensive than was originally postulated; remains inexplicably rare in Argentina. Occurs in Iguaçu National Park, Augusto Ruschi Biological Reserve, Intervales State Park and at least 13 other nominally protected areas in Brazil, where this species is protected by law; also in Caaguazú and San Rafael National Parks and Mbaracayú Forest Nature Reserve, in Paraguay, and Iguazú National Park, in Argentina. Despite some tolerance of second growth, appears to be largely dependent on primary forest and to occur naturally at low densities; extensive and continuing deforestation across most of its range may have caused a population decline and led to its disappearance from previously occupied locations. Less than 20% of original extent of lowland Atlantic Forest remains intact, and surviving forest, even within protected areas, suffers from agricultural conversion, mining, urbanization, industrialization, and associated road-building; in Paraguay alone, 38% of forests disappeared between 1984 and 1991, less than 10% is now left, and significant forest loss occurs even within San Rafael National Park. Returning this species to its previous conservation status of Vulnerable may be appropriate.

Bibliography. Belton (1985), Canevari *et al.* (1991), Chebez (1994), Clay & Madroño (1997), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cracraft (1985), Dunning (1992, 1993), Hayes (1995), Lowen *et al.* (1996), Madroño & Esquivel (1995), Madroño *et al.* (1997), Mazar Barnett & Pearman (2001), Meise (1954), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), de la Peña (1988), Pizo (2003), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Wege & Long (1995).



PLATE 29

inches 3

cm 8

Genus *ONYCHORYNCHUS*

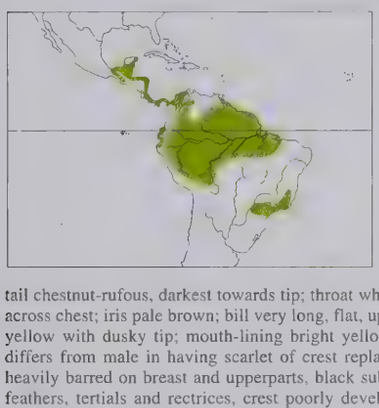
J. G. Fischer von Waldheim, 1810

202. **Royal Flycatcher**

Onychorynchus coronatus

French: Porte-éventail roi **German**: Kronentyrann **Spanish**: Mosquero Real
Other common names: Crowned Flycatcher; Northern Royal Flycatcher (*mexicanus*, *fraterculus*); Amazonian Royal Flycatcher (*coronatus*, *castelnaui*); Pacific Royal Flycatcher (*occidentalis*); Atlantic Royal Flycatcher (*swainsoni*)

Taxonomy. *Muscicapa coronata* Statius Muller, 1776, Cayenne.
Thought to be closest to *Platyrinchus* on basis of cranial and syringeal characters. Despite apparent similarity in voice across range, is sometimes split into four separate species on grounds of plumage variation and allopatric distributions, one in N (*mexicanus*, *fraterculus*), one in Amazonia (nominate, *castelnaui*), one in W (*occidentalis*) and one in E (*swainsoni*); further research required in order to determine validity or otherwise of such treatment. Within these groups racial variation doubtful; in particular, birds intermediate between *mexicanus* and *fraterculus* occur in Costa Rica and Panama. Six subspecies recognized.
Subspecies and Distribution.
O. c. mexicanus (P. L. Sclater, 1857) - S & E Mexico S to Panama.
O. c. fraterculus Bangs, 1902 - N Colombia and NW Venezuela.
O. c. occidentalis (P. L. Sclater, 1860) - W Ecuador (S to El Oro) and extreme NW Peru (Tumbes).
O. c. coronatus (Statius Muller, 1776) - S & E Venezuela, the Guianas and NE Brazil.
O. c. castelnaui Deville, 1849 - E of Andes, from SE Colombia and extreme S Venezuela (S Amazonas) S to NE Peru, much of Amazonian Brazil and N Bolivia.
O. c. swainsoni (Pelzeln, 1858) - SE Brazil (Bahia and Minas Gerais S to Paraná and Rio de Janeiro).



Descriptive notes. 15-17·5 cm; 13-21 g. Distinctive flycatcher with long rictal bristles; large crest, usually held flat, protrudes from rear of head, creating "hammerhead" appearance, when fully extended forms large, semicircular, forward-facing fan. Male nominate race has crest feathers shiny scarlet with a spot of black and steel-blue at tips (small bits of colour occasionally show through when crest held flat); buffy supraloral stripe and broken eyering, contrasting dark lores; mostly dark brown above, fine buff and black barring on lower back, rump cinnamon-rufous, wings with buff spots on tips of wing-coverts and tertials; tail chestnut-rufous, darkest towards tip; throat whitish, underparts warm buff, fine brown barring across chest; iris pale brown; bill very long, flat, upper mandible blackish, lower mandible horn to yellow with dusky tip; mouth-lining bright yellowish-orange; legs pale yellow-orange. Female differs from male in having scarlet of crest replaced with yellow or orange. Immature is more heavily barred on breast and upperparts, black subterminal bands outlining buffy fringe on back feathers, tertials and rectrices, crest poorly developed. Races vary mainly in size, bill and tail lengths, extent of barring on breast, colour of crest, and brightness of plumage (especially rump and tail): *castelnaui* is very similar to nominate, perhaps smaller and with less barring above; *swainsoni* is paler generally, with bright ochraceous-buff underparts and no breast markings; *occidentalis* is quite distinct, even brighter and paler than previous, upperparts and wings a warm tawny-brown, tail brighter and paler tawny; *mexicanus* has the crest orange-red in male and orange in female, rump and tail-coverts cinnamon-buff, tertials edged pale cinnamon, tail tawny-orange shading to brownish at tip, underparts buffy yellow; *fraterculus* perhaps has fewer markings on breast, paler cinnamon rump and tail. Voice. Usually quiet. A loud, mellow and hollow, upslurred "see-yuk" or "curr-lep" whistle, reminiscent of a *Galbula* jacamar or a *Manacus* manakin; song a descending, slowing series of 5-8 higher, sharper, plaintive whistles preceded by shorter introductory note, "whi, peeu peeu peeu peeu peeu" or "wh, wheeu wheeu wheeu wheeu wheeu", at rate of c. 1 note every 2 seconds.
Habitat. Lower levels of evergreen forest (both *várzea* and *terra firme*) and deciduous forest, woodland, gallery forest, mature secondary growth and forest borders, especially near shaded streams, ravines and other watercourses; mainly *várzea* in Amazonia. Also mixed mangrove and palm swamps in E Venezuela (Delta Amacuro); into lower montane Atlantic Forest in SE Brazil. Mainly lowlands to 1400, but recorded as high as 2000 m in Perijá foothills (Venezuela); in Costa Rica, sea-level to 750-900 m on Pacific slope but below 400 m on Caribbean slope; sea-level to 800 m in SE Brazil; usually below 600 m, rarely to 900 m, in W Ecuador.
Food and Feeding. Arthropods, especially dragonflies (Odonata), lepidopterans, homopteran bugs, hymenopterans, and other large flying insects. Usually solitary; away from Amazonia, however, recorded as joining mixed-species flocks, e.g. in SE Brazil (race *swainsoni*) associating with furnariids (foliage-gleaners, fire-eyes). Forages in lower and middle levels of forest, often near watercourses; sits quietly on perch, upright and alert, with tail held downwards, while searching for prey, then sallies to snap prey in flight or from foliage without hovering. Larger prey often beaten against perch to remove wings before being swallowed.
Breeding. Mar-Jun in Mexico, Jan-May in W Ecuador and Jan or austral spring in SE Brazil. In display, performed during courtship and agonistic interspecific and intraspecific encounters, raises and fully spreads crest, rhythmically sways head from side to side along a 180-degree arc, while slowly opening and closing bill to reveal bright mouth-lining. Nest built by female, pensile, 0·6-2 m long, a loose and matted mass of rootlets, small epiphytes, moss, dead leaves and other plant fibres, side entrance to shallow open-fronted inner chamber near middle; frequently suspended from slender branch or drooping vine 2·4-6 m above ground, but often over forest stream; territory defended by male. Clutch 2 eggs; female incubates eggs and tends chicks; no other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Race *occidentalis* (often treated as a separate species) Vulnerable; also a restricted-range taxon, present in Tumbesian Region EBA. Race *swainsoni* (often treated as a separate species) Endangered. Generally widespread, but never common. Race *mexicanus* fairly common to uncommon in Mexico, but possibly extirpated from El Salvador owing to habitat loss; in Costa Rica, uncommon to fairly common in NE and on Pacific slope but rare in Caribbean lowlands. In Venezuela, uncommon to rare in S & E (nominate) and uncommon and local in NW (*fraterculus*). The two threatened races have both suffered severe and extensive habitat loss, fragmentation and degradation. W *occidentalis* is scarce to rare, occurs naturally at low densities, and appears to be on verge of extinction; total population within its 7500 km² range in W Ecuador and adjacent NW Peru estimated at 2500-10,000, and declining. It occurs in Río Palenque Science Centre, Jauneche Biological Reserve Station, Machalilla National Park, Cerro Blanco Forest Reserve, Manglares-Churute Ecological Reserve, and probably within Cordillera de Molleturo Protection Forest, all in Ecuador, and Tumbes National Reserve, in Peru. Habitat has suffered deforestation rates of 57% per decade from 1958 to 1988, and continuing rapid forest loss, coupled with degradation caused by grazing goats and cattle, may soon lead to disappearance of all unprotected forest habitat in the region; moreover, logging, livestock grazing and land clearance by settlers threaten important protected areas for this taxon; although it has been found to forage in degraded habitats, it is thought to depend on intact moist forest for breeding. A reforestation project within the partially forested Chongón-Colonche Protection Forest (776 km²) may benefit *occidentalis*; efforts to prevent further habitat degradation within protected areas and to survey areas of known and potential occurrence are necessary for its conservation. Similarly, race *swainsoni*, confined to the dwindling and severely fragmented forests of SE Brazil (possibly also an old record from Goiás), has an estimated total population of 2500-10,000 individuals and is also declining; it was always considered rare, and few recent records exist (e.g. in Paraná). Within its range of 3550 km², it occurs in Monte Pascoal, Itatiaia and Serra da Bocaína National Parks, Intervales State Park, Ubatuba Experimental Station, and Guaricana Forest Reserves (Guaratuba and Morretes); other important areas are near Estacão Vera Cruz (S Bahia), several sites in the Serra do Mar (São Paulo) and seven sites in Paraná. Habitat and population surveys and clarification of its taxonomic status would benefit the conservation of this taxon.
Bibliography. Anon. (1998a), Berg (2002b), Best & Kessler (1995), Clements & Shany (2001), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Graves (1990), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Lee Jones (2004), Monroe (1968), Munn (1985), Oren & Parker (1997), Parker & Carr (1992), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgely *et al.* (1998), Ridgway (1907), Sick (1993, 1997), Slud (1964), Stattersfield & Capper (2000), Stiles & Skutch (1989), Stotz *et al.* (1996), Thurber *et al.* (1987), Tobias *et al.* (1993), Tostain *et al.* (1992), Wege & Long (1995), Wetmore (1972), Whittingham (1994), Whittingham & Williams (2000), Williams & Tobias (1994), Zimmer (1939b).

Genus *CNIPODECTES*

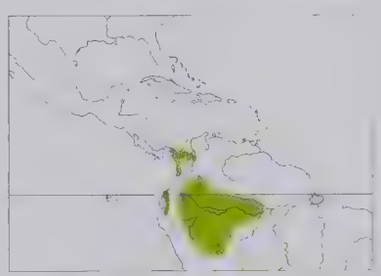
P. L. Sclater & Salvin, 1873

203. **Brownish Twistwing**

Cnipodectes subbrunneus

French: Platyrhynque brun **German**: Drehschwingentyrann **Spanish**: Mosquero Pardo
Other common names: Brownish Flycatcher

Taxonomy. *Cyclorhynchus subbrunneus* P. L. Sclater, 1860, Babahoyo, Los Ríos, Ecuador.
Affinities uncertain; toe structure suggests relationship to family Pipridae; a new species recently discovered in SE Peru appears to belong to this hitherto monospecific genus (see page 186). Races poorly differentiated; birds from E Panama and NW Colombia sometimes separated as race *panamensis*, but no visible differences in plumage from nominate. Two subspecies recognized.
Subspecies and Distribution.
C. s. subbrunneus (P. L. Sclater, 1860) - E Panama, W Colombia and W Ecuador.
C. s. minor P. L. Sclater, 1884 - W Amazon from Colombia and E Ecuador S to Peru, W Brazil and NW Bolivia.



Descriptive notes. 14-18 cm. Dull brown tyrannid with long and prominent rictal bristles. Male has dull brown head, buff loral spot; upperparts dull brown, wings darker or duskier, wing-coverts and tertials narrowly edged dull rufous-buff; uniquely modified outer primaries with stiffened and twisted shafts; rump and long tail more rufous or rufescent brown than back; throat pale brown or greyish-brown, becoming browner on breast, belly grey or yellowish dingy white, vent buff; iris brown to orange; bill broad, upper mandible black, lower mandible orange-yellow; legs black. Differs from similar Thrush-like Schiffornis (*Schiffornis turdina*) in having rufous edging on wings. Female is smaller than male, lacks distinctive primary morphology. Juvenile also has unmodified primaries. Race *minor* is similar to nominate, perhaps paler and tinged slightly more olive. Voice. Call a sharp, somewhat nasal whistle, "kuuuu-wit", usually doubled and occasionally tripled; song a distinctive and emphatic "kuheer", often repeated as "kuheer kuheer-quer", reminiscent of that of Blue-backed Manakin (*Chiroxiphia pareola*), often preceded by 1-2 loud bill-snaps. Audible mechanical "pr'r'r'r'r'" wing rattle in flight.
Habitat. Lower growth of humid and deciduous forest, secondary woodland; favours shady areas with many vines and tangles in understorey, areas above open dark forest floor, and near streams;

On following pages: 204. Flavescent Flycatcher (*Myiophobus flavicans*); 205. Orange-crested Flycatcher (*Myiophobus phoenicomitra*); 206. Unadorned Flycatcher (*Myiophobus inornatus*); 207. Roraiman Flycatcher (*Myiophobus roraimae*); 208. Handsome Flycatcher (*Myiophobus pulcher*); 209. Orange-banded Flycatcher (*Myiophobus lintoni*); 210. Ochraceous-breasted Flycatcher (*Myiophobus ochraceiventris*); 211. Olive-chested Flycatcher (*Myiophobus cryptoxanthus*); 212. Bran-coloured Flycatcher (*Myiophobus fasciatus*).

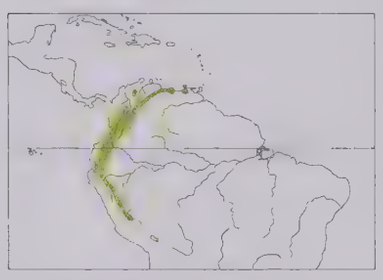
associated with bamboo in Bolivia, though not elsewhere. Seems to be confined to *terra firme* forest in E Ecuador. Mainly lowlands, ranging up Andean slopes to 1200 m (W Colombia); one record at 1900 m (Ecuador), possibly an error.
Food and Feeding. Little known. Insects. Usually solitary and often highly sedentary; rarely joins mixed flocks. Rather unsuspicious. Frequently slowly stretches one wing over back in a casual or leisurely motion.
Breeding In Colombia, Jan-Apr in W (N Antioquia, Chocó) and Jun in S (W Caquetá). Possibly occurs in scattered leks; use of uniquely modified primaries unknown, presumably serve a purpose in display. Nest (Barro Colorado I. in Panama) generally a pensile, cylindrical mass 1 m long, of dangling fibres, with side entrance, attached to aerial root 2 m above ground; similar to that of *Onychorynchus coronatus*. No other information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Rare to uncommon in most of range; locally fairly common in Panama and E Ecuador. Appears to be fairly widespread. Numerous along Pipeline Road (Canal Zone), in Panama, and at Jauneche Biological Research Station and Manglares-Churute Ecological Reserve, both in Ecuador. Occurs also in Darién National Park, in Panama, Tinigua National Park, in Colombia, Jatun Sacha Biological Reserve, in Ecuador, and Jaú National Park, in Brazil. Numbers in W Ecuador have declined following deforestation, but this species may be capable of persisting in isolated forest fragments.
Bibliography. Anon. (1998a), Chapman (1917c), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Haffer (1975), Hilty & Brown (1986), López (1999b), Meyer de Schauensee (1982), Parker & Remsen (1987), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Schulenberg *et al.* (2001), Sick (1993, 1997), Stotz *et al.* (1996), Traylor & Fitzpatrick (1982), Wetmore (1972), Zimmer (1939b).

Subfamily FLUVICOLINAE
Tribe CONTOPINI
Genus *MYIOPHOBUS* Reichenbach, 1850

204. **Flavescent Flycatcher**
Myiophobus flavicans

French: Moucherolle flavescent **Spanish**: Mosquero Amarillo
German: Gelbzügel-Schnäppertyrann

Taxonomy. *Myiobius flavicans* P. L. Sclater, 1861, Pallatanga, Ecuador.
Most closely allied with *M. phoenicomitra*, *M. inornatus* and *M. roraimae*. Five subspecies recognized.
Subspecies and Distribution.
M. f. perijanus Phelps, Sr & Phelps, Jr, 1957 - W Venezuela (Sierra de Perijá, also E slope of Tamá).
M. f. venezuelanus (Hellmayr, 1920) - N Venezuela (coastal range S to Andes of Táchira).
M. f. caripensis J. T. Zimmer & Phelps, Sr, 1954 - NE Venezuela.
M. f. flavicans (P. L. Sclater, 1861) - mountains of Colombia (all three ranges) S to E & W Ecuador and N Peru (N of R Marañón).
M. f. superciliosus (Taczanowski, 1875) - C Andes of Peru (S to Cuzco).

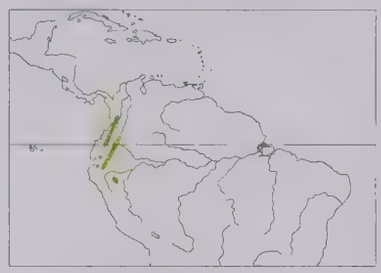


Descriptive notes. 12-12·7 cm; 10·2 g. Male nominate race has olive crown with semi-concealed yellow or orange coronal patch, prominent yellowish supraloral line and broken eyering; upperparts olive; wings and tail dusky, 2-3 cinnamon wingbars, lower one more prominent, remiges edged cinnamon, tertials edged buffy white, rectrices edged buffy olive; throat and underparts yellow, brightest on belly, breast flammulated with faint streaks of olive; iris dark; bill fairly broad, upper mandible black, lower mandible brownish or dusky flesh-coloured; legs black. Female lacks coronal patch. Juvenile is like female. Races vary in colours of coronal patch, supraloral stripe and eyering, breast colour and extent of flammulation, wing markings, and colour of lower mandible: *venezuelanus* is less flammulated below, has smaller and always yellow crown patch, flesh-coloured lower mandible; *caripensis* is similar to previous but yellower below, with less olive; *perijanus* is also similar but with all-dark bill; *superciliosus* has almost plain wings with one narrow cinnamon wingbar (on greater coverts), duller brown edges of remiges, all-black bill, yellower lores and eyering than nominate. Voice. Usually quiet. Call a sharp "tsink" or "chiyp"; infrequently heard song, perhaps given mainly at dawn, described as fast rhythmic series of 5-8 "kawhik" notes.
Habitat. Lower and middle strata of humid forest, forest borders, and bamboo tangles; 900-2700 m, mainly above 1500 m.
Food and Feeding. Insects, mostly hymenopterans, beetles (Coleoptera) and earwigs (Dermaptera), occasionally bugs (Hemiptera) and lepidopteran larvae. Forages alone or in groups of 2-3 birds, usually not with mixed-species flocks. Erect posture similar to that of *Empidonax* flycatchers. Forages by sallying short distances from low, dark perch to snatch prey from leaves, twigs, air or the ground.
Breeding. Nesting recorded in Feb in NE Venezuela (Cueva de los Guácharos) and SC Colombia (Huila); birds in breeding condition in Jun in N Venezuela (Perijá Mts), and in Colombia in Mar (SW Huila) and Oct (Boyacá); fledgling in Jul (W Nariño) and juvenile in Sept (Cundinamarca) in Colombia, and juveniles in Aug (NW) and Jan (NE) in Ecuador. Nest a cup of twigs and small vines, lined with feathers. No other information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common. In Venezuela, regular near Choroní Pass, in Henri Pittier National Park, and occurs on Cerro Negro, in Cueva del Guácharo National Park. Present also in Tambito Nature Reserve, in Colombia, and Guandera Biological Reserve, in Ecuador.
Bibliography. Chapman (1917c), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996).

205. **Orange-crested Flycatcher**
Myiophobus phoenicomitra

French: Moucherolle à cimier orange **Spanish**: Mosquero Crestinaranja
German: Olivrücken-Schnäppertyrann

Taxonomy. *Myiobius phoenicomitra* Taczanowski and Berlepsch, 1885, [Hacienda] Mapoto, Tungurahua, Ecuador.
Most closely allied with *M. flavicans*, *M. inornatus* and *M. roraimae*. Two subspecies recognized.
Subspecies and Distribution.
M. p. litae (Hartert, 1900) - W slope of Andes in W Colombia and W Ecuador.
M. p. phoenicomitra (Taczanowski & Berlepsch, 1885) - E slope in E Ecuador and NE Peru.



Descriptive notes. 11·5-12 cm. Male has olive crown, semi-concealed orange-rufous, orange-red or golden-yellow coronal patch, sometimes a narrow yellow broken eyering; upperparts olive; wings blackish, 2-3 ochraceous wingbars, lower one more prominent, cinnamon-edged remiges, buffish-white edges of tertials; tail dusky, feathers edged buffy olive; throat and underparts yellow, brightest on belly, breast flammulated with faint streaks of olive; iris dark; bill fairly broad, upper mandible black, lower mandible flesh-coloured; legs black or dark grey. Female lacks coronal patch. Juvenile is similar to female, but browner above, cinnamon wingbars, buffy margins of tertials. Differs from *M. flavicans* in having generally darker upperparts with less buffy edging on tertials. Race *litae* is similar to nominate but smaller, slightly brighter yellow on belly, wider and deeper ochre wingbars. Voice. Call (NW Ecuador) a thin, weak, high-pitched "tsut, tseép-tsu".
Habitat. Lower growth of forest and forest borders, at 500-1550 m.
Food and Feeding. Insects, probably similar to those taken by *M. flavicans*. Solitary or in small groups of 2-3 individuals, usually not associated with mixed-species flocks. Erect posture similar to that of *Empidonax* flycatchers. Forages by sallying short distances from low perch, snatching prey from leaves, twigs, air or the ground.
Breeding. Birds in breeding condition in late Mar and mid-Jun in Colombia (upper Anchicayá Valley). No other information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Considered to be generally uncommon to fairly common, but local within its narrow elevational zone. Occurs in Podocarpus and Sangay National Parks, in Ecuador.
Bibliography. Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Strewe (2000b).

206. **Unadorned Flycatcher**
Myiophobus inornatus

French: Moucherolle simple **Spanish**: Mosquero Sencillo
German: Zimtflügel-Schnäppertyrann

Taxonomy. *Myiophobus inornatus* Carriker, 1932, Santo Domingo (Inca Mine), 6000 feet [c. 1830 m], Puno, Peru.
Most closely allied with *M. flavicans*, *M. phoenicomitra* and *M. roraimae*. Monotypic.
Distribution. E slope of Andes from SE Peru (S from Cuzco) S to N Bolivia (S to Cochabamba).



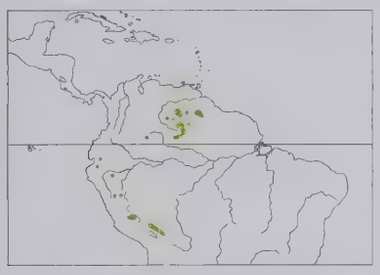
Descriptive notes. 11·5-12 cm. Male has olive crown with semi-concealed yellow or orange coronal patch, prominent yellowish supraloral line and broken eyering; upperparts olive; wings and tail dusky, two cinnamon-rufous wingbars, cinnamon-rufous edges of remiges, whitish-buff margins of tertials, rectrices edged buffy olive; throat yellowish-white, underparts pale yellow, breast flammulated with faint streaks of olive; birds from Bolivia (Cochabamba) generally more yellowish above and below; iris dark; bill fairly broad, upper mandible black, lower mandible flesh-coloured; legs black. Female probably lacks coronal patch. Juvenile undescribed. Distinguished from closely similar *M. flavicans* (of race *superciliosus*) mainly by browner upperparts. Voice. Call a high-pitched "zit" or "zib".
Habitat. Lower and middle levels of humid forest and forest borders, at 1000-2600 m.
Food and Feeding. Insects. Forages alone or in groups of 2-3 individuals, usually not with mixed-species flocks. Erect posture similar to that of *Empidonax* flycatchers. Makes short sallies from perch to snatch prey from leaves, twigs, air or the ground. Forages in more open areas and higher above ground than *M. flavicans*.
Breeding. Little known. Eggs recorded in Oct in Bolivia (La Paz) and Nov in Peru (Puno).
Movements. Probably resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Bolivian and Peruvian Lower Yungas EBA. Rare to uncommon, locally fairly common. Regularly seen along Manu road, in Peru. Forests within this species' range have been extensively converted for agricultural cultivation, especially cash crops such as coca and coffee. Several large protected areas have, however, been established, including Tambopata-Candamo Reserved Zone and Manu National Park and Biosphere Reserve, in Peru, and Madidi National Park, in Bolivia.
Bibliography. Carriker (1935), Clements & Shany (2001), Cracraft (1985), Fjeldså & Krabbe (1990), Hennessey & Gómez (2003), Hennessey, Herzog & Sagot (2003), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Stotz *et al.* (1996).

207. Roraiman Flycatcher

Myiophobus roraimae

French: Moucherolle du Roraima **Spanish**: Mosquero del Roraima
German: Tepuischnäppertyrann

Taxonomy. *Myiobius roraimae* Salvin and Godman, 1883, Roraima, Venezuela.
Most closely allied with *M. flavicans*, *M. phoenicomitra* and *M. inornatus*. Three subspecies recognized.
Subspecies and Distribution.
M. r. roraimae (Salvin & Godman, 1883) - S & SE Venezuela and W Guyana.
M. r. sadiecoatsae Dickerman & Phelps, Jr, 1987 - Cerro de la Neblina, on border between S Venezuela and NW Brazil.
M. r. rufipennis Carriker, 1932 - very locally in E Colombia, Ecuador, SE Peru and NW Bolivia.



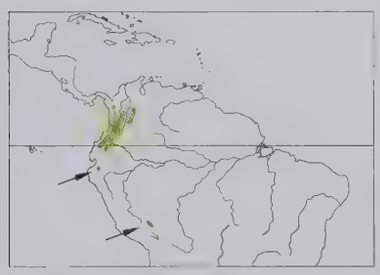
Descriptive notes. 13·5 cm; 12·8-13·6 g. Male has crown warm rufescent brown, tinged olive, auriculars more olive, semi-concealed orange-rufous coronal patch, narrow yellowish-white broken eyering; upperparts olive-brown, wings dusky or blackish, two broad rufous wingbars, rufous-edged remiges, buffier on edges of tertials; tail dusky brown with indistinct dark rufous margins; throat dull greyish-white, breast and flanks dull greyish-olive, belly pale yellow in centre; iris dark brown; bill fairly broad, upper mandible greyish-brown, lower mandible dull orange-yellow; legs grey. Female lacks coronal patch. Juvenile is similar to female. Races rather similar in plumage. Voice. Call (Ecuador) an explosive and buzzy series of sputtered "tschew" notes, rising and then descending; also a softer sharp "pit" or "tschit" note, sometimes doubled or trilled at end; occasionally a sputtered series of chattering between individuals, "jjttt-jjjttt-jjttt-tschit".
Habitat. Low and middle growth of humid forest on slopes of tepuis, and impoverished or sandy-soil forests of outlying Andean ridges. At 1300-1800 m on tepuis; on Cerro de la Neblina (race *sadiecoatsae*), 900-2000 m in Venezuela but down to 500 m on Brazilian side; 1100-1700 m in Andean region.
Food and Feeding. Diet consists of insects. Forages alone or in groups of up to three individuals, usually not with mixed-species flocks. Erect posture similar to that of *Empidonax* flycatchers. Forages by sallying short distances from low dark perch to snatch prey from leaves, twigs, air or the ground.
Breeding. No information.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to common in N of range; rare to uncommon and very local in Andes (race *rufipennis*), where only recently recorded for first time in Bolivia (two localities in La Paz). Occurs in several protected areas, including Canaíma National Park, in Venezuela.
Bibliography. Chapman (1931), Cory & Hellmayr (1927), Dickerman & Phelps (1987), Forrester (1993), Gilliard (1941), Hilty (2003), Hilty & Brown (1986), Mayr & Phelps (1967), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Willard *et al.* (1991).

208. Handsome Flycatcher

Myiophobus pulcher

French: Moucherolle superbe **Spanish**: Mosquero Hermoso
German: Graukronen-Schnäppertyrann

Taxonomy. *Myiobius pulcher* P. L. Sclater, 1861, Quito, Ecuador.
Three subspecies recognized.
Subspecies and Distribution.
M. p. pulcher (P. L. Sclater, 1861) - W Colombia and NW Ecuador.
M. p. bellus (P. L. Sclater, 1862) - C & E Colombia and NE & SE Ecuador.
M. p. oblitus Bond, 1943 - SE Peru.



Descriptive notes. 9·5-11 cm. Male nominate race has crown olive grey, semi-concealed orange-rufous coronal patch, narrow white supraloral spot and broken eyering; nape olive-grey, rest of upperparts olive; wings dusky, two bold pale ochre (orange-buff) wingbars, pale ochre edges of secondaries (except at base) form dark patch alongside, outer webs of inner tertials edged whitish; tail relatively short, dusky; throat and breast dull ochre-yellow, belly pale yellow; iris dark; bill small, upper mandible black, lower mandible orange-yellow; legs grey. Female has coronal patch duller and reduced or absent. Juvenile undescribed. Race *bellus* is slightly larger than nominate, darker greyish-green above, deeper ochre wingbars, more distinct breastband of deeper ochre, slightly longer tail; *oblitus* resembles nominate but also slightly larger, with darker crown, buffy panel on basal portion of primaries. Voice. Song a clear sharp "tsi-tsi-tsi".
Habitat. Mostly middle and upper strata of humid forest, forest borders and secondary growth. Some variation in elevation among races; 1400-2600 m, rarely down to 800 m, in N (nominate) to 1500-3050 m in S (*oblitus*).
Food and Feeding. Insects. Usually in small group of 2-5 individuals, and accompanying mixed-species flocks of tanagers (Thraupidae) and other tyrannids in canopy. Forages by making short sallies to foliage or air.
Breeding. In breeding condition in Feb-Aug in Colombia. No other information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Uncommon to common or fairly common in N (nominate and race *bellus*); rare and local in Peru (*oblitus*). Occurs in Tambito Nature Reserve, in Colombia, and Cotacachi-Cayapas, Cotopaxi, Sumaco-Galeras, Antisana and Llanganates National Parks and Cayambe-Coca Ecological Reserve, all in Ecuador. Poorly known species.
Bibliography. Chapman (1917c), Clements & Shany (2001), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996).

209. Orange-banded Flycatcher

Myiophobus lintoni

French: Moucherolle de Linton **Spanish**: Mosquero de Linton
German: Orangeband-Schnäppertyrann

Taxonomy. *Myiophobus lintoni* Meyer de Schauensee, 1951, Cerro Imbana, 2600-2800 m, Loja, Ecuador.
Thought to be most closely related to *M. ochraceiventris*, both of which perhaps do not belong in this genus. Apparently replaces latter N of R Marañón (Peru). Monotypic.
Distribution. E slope of Andes in S Ecuador (Morona-Santiago, Azuay, Loja) and N Peru (Cerro Chinguela, in Piura).



Descriptive notes. 12·5 cm. Male is dark brownish-olive or greyish-olive above, darkest on crown, with semi-concealed yellow, orange or rufous coronal patch, inconspicuous narrow pale yellow eyering; wings and tail dusky, two broad cinnamon or ochraceous wingbars, outer remiges narrowly edged ochraceous, olive or white (inner remiges, tips of primaries and base of secondaries unmarked); yellow below, breast side washed olive; iris greyish-yellow to yellow; bill black, most of lower mandible dull orange; legs greyish. Female has coronal patch dull dark brown and reduced (or lacking), may also be paler yellow below. Juvenile lacks coronal patch, has deeper rufous-buff wingbars, paler underparts, yellow base of upper mandible and entire lower mandible. Voice. Calls include sharp "chip" and "chep" or "peeyk" notes, repeated while foraging; dawn song a series of "tsin" notes.
Habitat. Middle and, rarely, upper levels of montane forest, cloudforest and elfin forest, and second growth at forest borders and landslides; 2250-3200 m.
Food and Feeding. Insects; possibly also fruit. Forages alone or in groups of 2-6 individuals, at times actively, often with mixed flocks, including tanagers (Thraupidae). Erect posture similar to that of *Empidonax* flycatchers. Uses short sallies to glean insects from upper leaf surfaces, as well as upward sallies, and hover-gleaning, perch-gleaning and hanging manoeuvres; often perches on top of large leaves.
Breeding. Juvenile and immature reported in Jun. No other information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Southern Central Andes EBA. Rare to fairly common, but local within tiny range. In Ecuador, relatively numerous in Tapichalaca Reserve (above Valladolid, in Zamora-Chinchipe) and in Cordillera de Cordoncillo (S of Saraguro, in Loja), and occurs also in Podocarpus National Park (Cajanuma sector). Habitat loss, and forest degradation caused by grazing livestock, pose a major risk to this species. Because of its very limited range and continuing rapid habitat destruction, it may even merit conservation status of Vulnerable.
Bibliography. Bloch *et al.* (1991), Clements & Shany (2001), Collar *et al.* (1994), Cracraft (1985), Fjeldså & Krabbe (1990), Jácome (2002b), Meyer de Schauensee (1982), Parker *et al.* (1985), Rasmussen *et al.* (1996), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996).

210. Ochraceous-breasted Flycatcher

Myiophobus ochraceiventris

French: Moucherolle à poitrine ocre **Spanish**: Mosquero Pechiocre
German: Ockerhals-Schnäppertyrann

Taxonomy. *Mitrephorus ochraceiventris* Cabanis, 1873, Marayniоc, Junín, Peru.
Thought to be most closely related to *M. lintoni*, both of which perhaps do not belong in this genus. Apparently replaced by latter N of R Marañón, in Peru. Monotypic.
Distribution. E slope of Andes from N Peru (S & E of R Marañón) S to NW Bolivia.



Descriptive notes. 12-14 cm; 10-11 g. Male has dark brownish-olive crown, semi-concealed yellow to reddish-orange coronal patch (becoming redder S of C Peru), dusky lores, ochre supraloral patch and crescent above eye, thin buffy crescent below eye; ear-coverts, nape and upperparts brownish-olive, wings and tail dusky, two prominent buff-whitish wingbars, margins of secondaries yellowish, margins of tertials white; chin yellowish, throat and breast orange-ochre (colour extending under ear-coverts), belly yellow; iris dark; bill all black; legs black. Female has coronal patch duller reddish-chestnut. Juvenile usually lacks coronal patch. Voice. Call (Peru) a sharp and emphatic "tschew-it", sometimes followed by slightly sweeter "tse-weeuuu"; also a hard but soft "theeuuk"; in excitement a series of soft but sharp "pstttpsst", sometimes followed by thin descending trill, which in turn occasionally followed by series of harsh scolding "scwee-scwee" or "schee-schee-schee" notes.
Habitat. Montane forest, cloudforest and elfin forest and humid thickets, near timber-line; 2800-3500 m, locally down to 2200 m.
Food and Feeding. Insects; some fruit also eaten. Forages alone or in groups of 3-5 individuals, often with mixed-species flocks of tanagers (Thraupidae). Erect posture similar to that of *Empidonax* flycatchers. Forages in middle and upper strata of forest, using short sally, hover-glean, perch-glean and hanging manoeuvres; often perches on top of large leaves.
Breeding. Juvenile reported in Mar in Peru. No other information.
Movements. Probably resident.

Status and Conservation. Not globally threatened. Locally fairly common to common. In Peru, regularly observed in Río Abiseo National Park and in the Machu Picchu Historical Sanctuary (Sayacmarca-Phuyupatamarca Inca Trail), and from Shintuya-Paurcatambo (Manu) road, in Cuzco. Also regular in Chusipata area of Yungas in La Paz, in Bolivia.
Bibliography. Chapman (1921), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Hennessey, Herzog & Sagot (2003), Meyer de Schauensee (1982), Remsen (1984, 1985), Ridgely & Tudor (1994), Stotz *et al.* (1996), Walker (2001).

211. Olive-chested Flycatcher

Myiophobus cryptoxanthus

French: Moucherolle à poitrine olive **Spanish**: Mosquero Pechioliva
German: Grauflecken-Schnäppertyrann

Taxonomy. *Myiobius cryptoxanthus* P. L. Sclater, 1861, Zamora, Zamora-Chinchipe, Ecuador.
Monotypic.
Distribution. Base of E Andes in E Ecuador (Sucumbíos S to Zamora-Chinchipe) and NE Peru (San Martín).



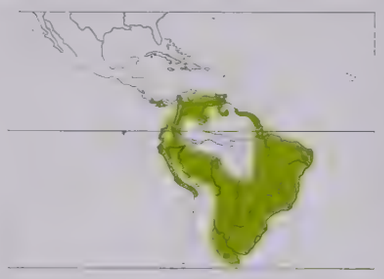
Descriptive notes. 12 cm. Has dull olive-brown crown, semi-concealed yellow coronal patch, dark lores, whitish supraloral line and thin broken eyering; head side, nape and upperparts dark olive, wings and tail dusky, two broad pale whitish-buff wingbars; throat dirty white, breast with band of broad greyish-olive streaks, blurry streaking on flanks, pale yellow belly and vent; iris dark; bill all black; legs black. Sexes alike. Juvenile undescribed. Voice. Calls include "weee d'd'd'd'd'd'd"; dawn song a repeated series of "chwee" notes. Similar to voice of *M. fasciatus*.
Habitat. Shrubby clearings, pastures, secondary woodland and forest borders in foothills and E Andean slopes; mostly 300-1100 m, occasionally as high as 1800 m.
Food and Feeding. Insects, including beetles (Coleoptera), ants and small wasps (Hymenoptera), flies (Diptera); some small berries probably also taken. Forages alone or in pairs, not with mixed-species flocks, and usually low, close to ground. Uses aerial sallies and perch-glean manoeuvres to capture prey from air or leaves.
Breeding. No information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Restricted-range species; present in Upper Amazon-Napo Lowlands EBA. Uncommon to locally fairly common in Ecuador, rare in Peru; range possibly extends N into adjacent S Colombia. This species benefits from forest clearance, and is possibly increasing in E Ecuador; now numerous in Zumba region and along Loreto road N of Archidona, but becomes scarcer towards E lowlands. Fairly common in Serranías Cofán, Sucumbíos, and occurs also in Jatun Sacha Biological Station and Podocarpus National Park, all in Ecuador.
Bibliography. Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Hornbuckle (1999), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Zimmer (1939b).

212. Bran-coloured Flycatcher

Myiophobus fasciatus

French: Moucherolle fascié **German**: Rostschnäppertyrann **Spanish**: Mosquero Estriado
Other common names: Rufescent/Lima Flycatcher (*rufescens*)

Taxonomy. *Muscicapa fasciata* Statius Muller, 1776, Cayenne.
Race *rufescens* distinctive, possibly a separate species. Seven subspecies recognized.
Subspecies and Distribution.
M. f. furfurosus (Thayer & Bangs, 1905) - SW Costa Rica (Téraba Valley) and W Panama (including Pearl Is).
M. f. fasciatus (Statius Muller, 1776) - Venezuela, Trinidad, the Guianas, N Brazil (Amapá), Colombia (except SW) and E Ecuador.
M. f. crypterythrus (P. L. Sclater, 1861) - SW Colombia, W Ecuador and NW & N Peru.
M. f. rufescens (Salvadori, 1864) - W Peru and extreme N Chile.
M. f. saturatus (Berlepsch & Stolzmann, 1906) - E Peru.
M. f. auriceps (Gould, 1839) - SE Peru, W Brazil, N & E Bolivia, N Argentina and W Paraguay.
M. f. flammiceps (Temminck, 1822) - E Brazil and E Paraguay S to NE Argentina and Uruguay.



Descriptive notes. 12-12·7 cm; 9·5-10·5 g. Male nominate race has reddish-brown crown, semi-concealed yellow to orange-rufous coronal patch, short yellowish-white supraloral line and thin eyering, brown lores; head side, nape and upperparts reddish-brown; wings dusky or dark brown, two broad and prominent buff-white wingbars, buff-white edges of tertials, margins of secondaries dark basally, then narrowly edged buff (sometimes forming light panel in wing); tail dark brown; throat and underparts dull white, short fine greyish-brown streaks across breast and flanks, centre of belly sometimes tinged yellow; iris dark; upper mandible black, lower mandible dark with orange-yellow basally; legs black. Female is less heavily streaked below, has coronal patch much reduced or absent. Juvenile lacks coronal patch, is brighter above, wingbars more rufous. Races vary in plumage and size, slightly larger in S: *saturatus* is duller than nominate, brown of upperparts lacking rufous tinge, belly deeper yellow; *auriceps* is very like nominate, but darker brown above, darker brown streaking on breast, white belly; *flammiceps* is larger, warmer brown above, white belly; *crypterythrus* is more distinctive, crown patch rufous, upperparts brownish-grey, heavier streaking on breast, white belly; *furfurosus* has most reddish-brown upperparts of all, rufous-white wingbars, yellower on belly, orange-yellow lower mandible; *rufescens* is most distinctive, brown above, ochre to rufous wingbars, uniform orange-rufous and unstreaked below. Voice. Call described as "chlep", "jewleh", muffled "squek" or low "wheesp" or "wheeh". Dawn song a series of low husky whistles in a repeated phrase e.g. as "tep, chew-e", "weé, wu-du", "djili-dju" or "jili-juh", middle note lowest after slight pause; daytime song a rattled trill, "whee-yee-yee-yee-yee-yee" or "wee'he'he'he'e".
Habitat. Lower to middle strata of dry forest, forest edge, brushy savanna, hedgerows and pastures, riparian thickets in arid areas; also successional vegetation along rivers and on river islands. *llanos* in E Colombia and Venezuela, *capoeira* in Brazil. Also bamboo at 500-1000 m in SE Peru during austral winter. Sea-level to 1500 m; also higher, to 2650 m in Bolivia (*auriceps*) and to 2600 m in E Andes of Colombia (nominate); 900-1200 m in Costa Rica.
Food and Feeding. Insects, including beetles (Coleoptera), ants and small wasps (Hymenoptera) and flies (Diptera); some small berries also included in diet. Forages alone or in pairs, not with mixed-species flocks. Perches upright, often twitching wings, occasionally also tail. Uses aerial sallies and perch-glean manoeuvres to capture prey from air or leaves, usually low down, close to ground.
Breeding. Apr-Jun in Costa Rica, Mar-Aug (once Oct) in Trinidad and Oct-Jan/Feb in Argentina. Nest a deep and well-constructed cup, internal diameter c. 4 cm, depth c. 4 cm, usually of grass, thin stems, vines, rootlets, with green moss on outside, usually bound by spiderwebs, saddled in fork of small tree or shrub 1·2-3·6 m above ground. Clutch 2 eggs, sometimes 1; incubation by female, period usually 17 days; chicks fed by both parents, fledging period 15-17 days. Nest sometimes parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Mostly resident; S populations migratory. Those breeding S of about Paraguay and SE Brazil (Rio Grande do Sul) leave breeding grounds during austral winter; increase in numbers also recorded in SE Peru during austral winter.
Status and Conservation. Not globally threatened. Fairly common to common through much of its range, and the most widespread of genus; somewhat more local in Costa Rica, the Guianas and E Ecuador. Occurs in many national parks and other protected areas. Benefits from habitat conversion; appears to thrive in shrubby successional vegetation that follows deforestation. Race *rufescens*, possibly a separate species, is confined to relatively small range on Pacific slopes in W Peru and N Chile; seems less numerous and more local, but does occur in Northwest Biosphere Peru Reserve, in Peru.
Bibliography. Anon. (1998a), Bond *et al.* (1989), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Clements & Shany (2001), Cory & Hellmayr (1927), Di Giacomo (2004), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Fitzpatrick (1980a), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hilty (2003), Hilty & Brown (1986), Jaramillo (2003), Johnson (1967), Joseph (1996), Klimaitis & Moschione (1987), Lowen *et al.* (1996), Narosky & Salvador (1998), Payne (1984), de la Peña (1987, 1988, 1995), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson (1997), Robinson & Terborgh (1997), do Rosário (1996), Salaman (1994), Short (1975), Sick (1993, 1997), Skutch (1985), Slud (1964), Stiles & Skutch (1989), Stotz *et al.* (1996), Temple (2002), Tostain *et al.* (1992), Wetmore (1972), Williams & Tobias (1994), Wright *et al.* (1985), Zimmer (1930, 1939b).

PLATE 30 ➤



PLATE 30

inches 3

cm 8

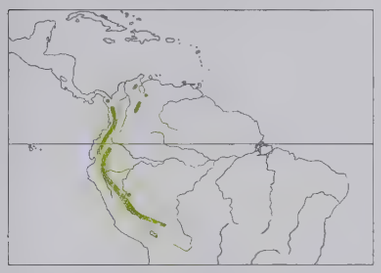
Genus *MYIOBIUS* Darwin, 1839

213. Tawny-breasted Flycatcher

Myiobius villosus

French: Moucherolle hérissé **German**: Gebirgsborstentyrann **Spanish**: Moscareta Vellosa

Taxonomy. *Myiobius villosus* P. L. Sclater, 1860, Nanegal, Pichincha, Ecuador.
Four subspecies recognized.
Subspecies and Distribution.
M. v. villosus P. L. Sclater, 1860 - locally in E Panama (Cerro Taracuna), W Colombia and NW Ecuador.
M. v. schaeferi Aveledo & Pons, 1952 - locally in NE Colombia and W Venezuela.
M. v. clarus J. T. Zimmer, 1939 - E Ecuador and E Peru.
M. v. peruvianus Todd, 1922 - SE Peru and NW Bolivia.



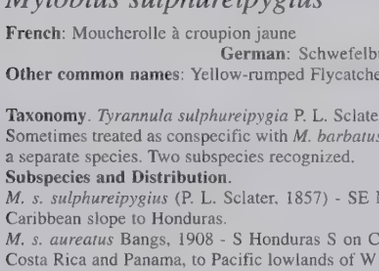
Descriptive notes. 14 cm; 13 g. Large eyes, prominent long rictal bristles. Male nominate race has crown, nape, and upperparts dark brownish-olive, semi-concealed yellow coronal patch, paler supraloral area, pale eyering broader to rear, greyer on face; rump sulphur-yellow, uppertail-coverts black; wings dark with olive-brown feather edges; tail long, rounded, black; throat dirty white, underparts mostly ochre to tawny-brown, central belly dull yellow; iris dark; bill broad, upper mandible grey to black, lower mandible flesh-coloured with dusky tip; legs grey. Distinguished from *M. sulphureipygius* by larger size, darker coloration, especially on underparts. Female is similar to male, but coronal patch cinnamon-rufous or absent. Races differ subtly in plumage, mainly in coloration of upperparts and underparts: *schaeferi* resembles nominate but has stronger indication of breastband; *peruvianus* has more distinct band on breast, more extensive yellow below; *clarus* differs from previous in generally greener upperparts. Voice. Generally quiet; sometimes a sharp "espít" call note, similar to that of *M. sulphureipygius*.
Habitat. Lower and middle levels of montane forest, near streams. Occurs at 900-2100 m, locally down to 600 m; mainly at higher elevations than its congeners in Andes.
Food and Feeding. Arthropods, notably hymenopterans, coleopterans, homopteran bugs, and arachnids. Analysis of 77 prey items taken from stomachs in SE Peru gave: Coleoptera (44%); Hymenoptera (bees and wasps 25%, ants 21%); and Homoptera (planthoppers 5%, cicadas 5%). Singly or in pairs; regularly accompanies mixed-species flocks. Actively forages at low to middle levels, perhaps higher than *M. barbatus*; often fans tail, reminiscent of Old World fantails (*Rhipidura*), and droops wings to expose yellow rump; often pivots on perch, and frequently changes perches. Uses flush-and-chase strategy similar to that of *Myioborus*, pursuing flushed prey in short, acrobatic, aerial sallies.
Breeding. Not well known; probably similar to that of congeners.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Rare to locally common; particularly numerous at El Placer (Esmeraldas), in NW Ecuador. Occurs in Tambito Nature Reserve, in Colombia, Machalilla National Park, in Ecuador, and Madidi National Park and Pilón Lajas Biosphere Reserve, both in Bolivia.
Bibliography. Anon. (1998a), Aveledo & Pons (1952), Becker *et al.* (2000), Begazo (1995), Butler (1979), Chapman (1917c), Cory & Hellmayr (1927), Cracraft (1985), Delgado (1985), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996), Strewe (2000b), Wetmore (1972), Zimmer (1930, 1939a).

214. Sulphur-rumped Flycatcher

Myiobius sulphureipygius

French: Moucherolle à croupion jaune **Spanish**: Moscareta Culiamarilla
German: Schwefelbürzel-Borstentyrann
Other common names: Yellow-rumped Flycatcher (*aureatus*)

Taxonomy. *Tyrannula sulphureipygia* P. L. Sclater, 1857, Córdoba, Veracruz, Mexico.
Sometimes treated as conspecific with *M. barbatus*. Race *aureatus* thought by some to be possibly a separate species. Two subspecies recognized.
Subspecies and Distribution.
M. s. sulphureipygius (P. L. Sclater, 1857) - SE Mexico (from S Veracruz and N Oaxaca) S on Caribbean slope to Honduras.
M. s. aureatus Bangs, 1908 - S Honduras S on Caribbean slope, and locally on Pacific slope in Costa Rica and Panama, to Pacific lowlands of W Colombia and W Ecuador.



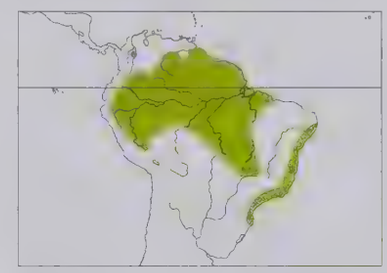
Descriptive notes. 12-13·5 cm; 12 g. Large eyes, prominent long rictal bristles. Nominate race has crown, nape and back dark olive, semi-concealed yellow coronal patch, paler loral region and cheek contrast with pale buffy-white eyering, latter broader to rear, and dark auricular mark; rump sulphur-yellow, uppertail-coverts black; wings dark with brown-olive feather edges; tail long, rounded, black; throat yellowish to buffy white, chest and sides ochraceous tawny, belly pale yellow; iris dark; bill broad, upper mandible grey to black, lower mandible flesh-coloured with dusky tip; legs grey. Female has yellow coronal patch reduced or absent. Juvenile also lacks yellow coronal patch, is browner above, paler below, sooty fringes of breast feathers giving smudgy look. Race *aureatus* differs from nominate in having brighter tawny breast and flanks. Voice. A "psik" call, often while foraging. Song a clear series of 4-6 "tschew" notes or "tseuu tseuu tseuu tseer tseer", quiet, rising and then falling, reminiscent of Dot-winged Antwren (*Microrhopias quixensis*). Dawn song a rapid repeated "chu wee-da-wiit" or "chu wee-da-ti-wit".
Habitat. Shady understorey and low to middle levels of humid forest, *terra firme* forest, gallery forest and old second growth. Typically, sea-level to 1000 m; 800-1200 m in Costa Rica.
Food and Feeding. Arthropods; diet probably similar to that of *M. villosus*. Singly or in pairs; often accompanies mixed-species flocks. Active forager, often fanning tail and drooping wings to expose yellow rump; also frequently flicks wings sideways, pivots on perch, and changes perches. Pursues flushed prey in short acrobatic aerial sallies; actively forages with *Myioborus*-like antics at low to middle levels, using a flush-and-chase strategy. Regularly with mixed flocks, including those following army ants, and often captures prey flushed by other birds.
Breeding. Mar-Jun in Costa Rica. Female constructs a messy, bell-shaped or pyriform nest of fine brown plant fibres, often suspended over stream from vine or twig 1-14 m up in open understorey; entrance low on side of nest, often covered by a "hood", bird often flies upwards to enter. Clutch 2 eggs; no information on incubation and fledging periods; chicks tended by female.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to common, and widely distributed. Quite local in certain areas owing to deforestation (e.g. Chiriquí, in Panama). Occurs in several national parks and other protected areas throughout its range, including Columbia River Forest Reserve and Lamanai Archaeological Reserve, in Belize, Laguna del Tigre National Park, in Guatemala, and Rancho Naturalista, Tarcol Lodge and Río Negro Jaguar Reserve, all in Costa Rica.
Bibliography. Anon. (1998a), Brodkorb (1943), Cory & Hellmayr (1927), Dearborn (1907), Greenberg (1992), Haffer (1974, 1975), Hilty (2003), Hilty & Brown (1986), Howell, S.N.G. & Webb (1995a), Howell, T.R. (1957), Land (1970), Lee Jones (2004), Lowery & Dalquest (1951), Monroe (1968), Paynter (1955, 1957), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Salaman (1994), Skutch (1960), Slud (1960, 1964), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1943, 1944, 1972), Williams & Tobias (1994), Winker *et al.* (1999).

215. Whiskered Flycatcher

Myiobius barbatus

French: Moucherolle barbichon **Spanish**: Moscareta Barbada
German: Gelbbauch-Borstentyrann
Other common names: Bearded Flycatcher

Taxonomy. *Muscicapa barbata* J. F. Gmelin, 1789, Cayenne.
Sometimes treated as conspecific with *M. sulphureipygius*. Race *mastacalis* possibly a separate species. Five subspecies recognized.
Subspecies and Distribution.
M. b. semiflavus Todd, 1919 - NC Colombia.
M. b. barbatus (J. F. Gmelin, 1789) - SE Colombia, E, S & SE Venezuela and the Guianas S to N Peru and NC Brazil.
M. b. amazonicus Todd, 1925 - E Peru and C Brazil.
M. b. insignis J. T. Zimmer, 1939 - NE Brazil.
M. b. mastacalis (Wied, 1821) - SE Brazil.



Descriptive notes. 12·5-12·7 cm; 11 g. Large eyes, prominent long rictal bristles. Nominate race has crown, nape and back olive-green, semi-concealed yellow coronal patch, paler loral region, yellowish-white eyering broadening to rear, greyer face; rump sulphur-yellow, uppertail-coverts black; wings dusky brown, slightly paler olive-brown margins of remiges; tail long, rounded, black; throat dirty white, chest grey with olive or brown tinge, sides often tinged ochre (variable), belly pale yellow; iris dark; bill broad, upper mandible grey to black, lower mandible flesh-coloured with dusky tip; legs grey. Sexes similar, but female has coronal patch reduced or lacking. Juvenile resembles female. Races differ slightly in breast colour: *mastacalis* is brightest and most distinct, with breastband tinged tawny-ochre; *insignis* is dullest, almost beige-tinged grey-olive across chest; *amazonicus* is slightly more greyish-olive across chest than previous; *semiflavus* resembles nominate but duller. Voice. Generally silent; sometimes a high sharp "tsip" or "psik" call note.
Habitat. Shady understorey and low to middle levels of humid forest, *terra firme* forest, gallery forest and old second growth, often near streams. Typically, sea-level to 1000 m; mostly below 600 m but locally to 1300 m in Ecuador. Replaced by *M. atricaudus* in drier forest, and by *M. villosus* at higher elevations.
Food and Feeding. Arthropods. Singly or in pairs; regularly accompanies mixed-species flocks that include thamnophilids (e.g. *Myrmotherula* antwrens, antshrikes), furnariids and others. Actively forages at low to middle levels; perches horizontally, often fans tail in manner reminiscent of Old World fantails (*Rhipidura*), droops wings to expose yellow rump, pivots on perch, and frequently changes perches. Uses flush-and-chase strategy, pursuing flushed prey in short acrobatic aerial sallies.
Breeding. Builds suspended pyriform nest with a roof or hood of overhanging twigs, and a side entrance; 2-10 m above ground. No further information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Occurs in many national parks and other protected areas throughout its range, e.g. Tinigua National Park, in Colombia, Manu National Park and Biosphere Reserve, in Peru, and at least three national parks and many other reserves in Brazil. Much of this species' habitat remains in relatively pristine condition, and it seems unlikely to be at any potential risk.
Bibliography. Anon. (1998a), Bangs & Penard (1918), Chapman (1931), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Cracraft (1985), Friedmann (1948), Gilliard (1941), Haffer (1974), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (1997, 2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Novaes (1978a), Oren & Parker (1997), Payne (1984), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001),

On following pages: 216. Black-tailed Flycatcher (*Myiobius atricaudus*); 217. Ruddy-tailed Flycatcher (*Terenotriccus erythrurus*); 218. Cinnamon Tyrant (*Neopipo cinnamomea*); 219. Cinnamon Flycatcher (*Pyrrhomyias cinnamomeus*); 220. Cliff Flycatcher (*Hirundinea ferruginea*).

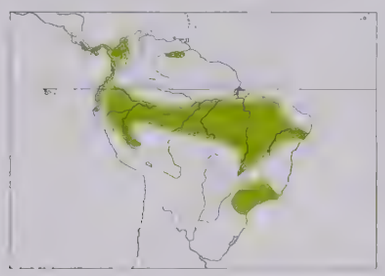
Sick (1993, 1997), Skutch (1981), Snethlage (1935), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992), Willard *et al.* (1991), Zimmer (1930, 1939a).

216. **Black-tailed Flycatcher**

Myiobius atricaudus

French: Moucherolle à queue noire **Spanish**: Moscareta Colinegra
German: Schwarzschwanz-Borstentyrann

Taxonomy. *Myiobius atricaudus* Lawrence, 1863, Isthmus of Panama.
Race *portovelae* sometimes lumped with nominate because of similarities in plumage and poorly defined geographical boundaries between the two. Seven subspecies recognized.
Subspecies and Distribution.
M. a. atricaudus Lawrence, 1863 - SW Costa Rica S to W Colombia.
M. a. modestus Todd, 1912 - locally in C & E Venezuela (N Bolívar).
M. a. portovelae Chapman, 1924 - W Ecuador and NW Peru.
M. a. adjacens J. T. Zimmer, 1939 - S Colombia, E Ecuador, E Peru, and W Brazil S of Amazon.
M a. connectens J. T. Zimmer, 1939 - NC & NE Brazil S of Amazon
M. a. snethlagei Hellmayr, 1927 - coastal NE Brazil.
M. a. ridgwayi Berlepsch, 1888 - SE Brazil.



Descriptive notes. 12-12·7 cm; 10 g. Large eyes, prominent long rictal bristles. Nominate race has crown, nape and back dark olive-green, semi-concealed yellow coronal patch, paler loral region, pale eyering broader to rear, greyer face; rump sulphur-yellow, uppertail-coverts black; wings dark with olive feather edges; tail long, rounded, black; throat dirty white, chestband dull tawny-buff or olive-buff, belly dull yellow; iris dark; bill broad, upper mandible grey to black, lower mandible dark flesh-coloured with dusky tip; legs grey. Sexes similar, but female has coronal patch smaller than male's. Immature resembles adult, but lacks yellow coronal patch. Races vary mainly in warmth of olive tone on chest, degree and intensity of yellow on belly, and coloration of rump: *portovelae* has breastband much warmer ochre-olive (warmest of "banded" races), belly brighter yellow; *modestus* has breastband slightly more ochre-tinged than nominate but still somewhat dull, not nearly so warm as previous; *adjacens* is in general somewhat paler than nominate, rump whiter, chest more buffy; *connectens* is rather dull, chest brownish-buff, rump whitish; *snethlagei* is distinctive, rump brighter yellow with slight orange-buff tinge, solid yellow below, slightly brighter on throat and breast (but no breastband effect); *ridgwayi* is also distinctive, similar in pattern to previous, but rump and underparts orange-buff, slightly richer on breast (no breastband), slightly browner on upperparts. Voice. Generally quiet; call a soft wiry "tsit" or "wit", weaker than that of *M. sulphureipygius*; song a sweet "cheer-cheer-cheer".
Habitat. Lower growth of dry to humid forest, lighter woodland, shrubby second growth, and forest borders, near water. In Amazonia found in *várzea* forest, and replaced by *M. barbatus* in *terra firme* forest; in Costa Rica, inhabits gallery woodland where *M. sulphureipygius* is absent. Sea-level to 1000 m in most of range; below 200 m in Venezuela; to 1400 m in arid valleys of W Colombia.
Food and Feeding. Arthropods. Singly or in pairs; regularly accompanies mixed-species flocks. Actively forages at low to middle levels; fans tail and droops wings, although not so frequently as do some other members of genus; frequently pivots on perch and changes perches. Uses flush-and-chase strategy, pursuing flushed prey in short aerial sallies, or sally-gleans insects from leaves. Often somewhat less active and acrobatic than *M. barbatus*.
Breeding. Apr in Costa Rica and Jun-Jul in Panama. Female constructs a messy bell-shaped or pyriform nest of fine brown plant fibres, suspended 0·4-3 m above ground, especially above stream or shore; side entrance low down, covered by "hood", bird often flying upwards to enter. Clutch 2 eggs; no information on incubation and fledging periods; chicks tended by female.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Occurs in Tarcol Lodge, in Costa Rica, Tambito Nature Reserve, in Colombia, Cerro Blanco Forest Reserve, Machalilla National Park, Manglares-Churute Ecological Reserve and Río Palenque Science Centre, in Ecuador, Northwest Peru Biosphere Reserve, in Peru, and Itatiaia National Park, Mata dos Godoy State Park (Paraná) and Cerros de Mata Estrela Private Reserve (Rio Grande do Norte), in Brazil. Numbers in In W Ecuador reduced because of habitat destruction (as in other disturbed areas), but much of the species' habitat within its relatively large range is still in reasonably pristine condition.
Bibliography. Anon. (1998a), Cory & Hellmayr (1927), Cracraft (1985), Haffer (1975), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Pacheco *et al.* (1996), Payne (1984), Peres & Whittaker (1991), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Salaman (1994), Schubart *et al.* (1965), Sick (1993, 1997), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1972), Williams & Tobias (1994), Zimmer (1930, 1939a).

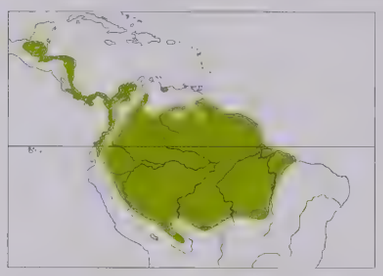
Genus *TERENOTRICCUS* Ridgway, 1905

217. **Ruddy-tailed Flycatcher**

Terenotriccus erythrurus

French: Moucherolle rougequeue **German**: Rotschwanztyrann **Spanish**: Mosquerito Colirrojo

Taxonomy. *M[yiobius] erythrurus* Cabanis, 1847, Cayenne.
Genus sometimes merged with *Myiobius*, with which thought to form a monophyletic clade. Validity of most races considered doubtful, and *signatus*, *purusianus* and *amazonus* perhaps better merged with *brunneifrons*; further work required to resolve internal taxonomy. Eight subspecies currently recognized.
Subspecies and Distribution.
T. e. fulvigularis (Salvin & Godman, 1889) - SE Mexico (from Tabasco and S Campeche), N Guatemala and Belize S to Panama, N & W Colombia and NW Ecuador, and locally in N Venezuela.
T. e. venezuelensis J. T. Zimmer, 1939 - SE Venezuela (Amazonas, S Bolívar) and immediately adjacent E Colombia (R Guainía) and extreme NW Brazil (upper R Negro).
T. e. erythrurus (Cabanis, 1847) - E Venezuela (E Bolívar), the Guianas and NE Brazil (R Negro E to Amapá).
T. e. signatus J. T. Zimmer, 1939 - E Colombia S to E Ecuador, E Peru (N of R Marañón) and locally NW Brazil (NW Amazonas S to R Solimões).
T. e. brunneifrons Hellmayr, 1927 -E Peru (S of R Marañón), adjacent SW Brazil and NW & W Bolivia.
T. e. purusianus (Parkes & Panza, 1993) - middle R Purús region of W Brazil.
T. e. amazonus J. T. Zimmer, 1939 - C Brazil S of Amazon (R Purús E to R Tapajós, S along R Madeira to region of mouth of R Jiparaná).
T. e. hellmayri (E. Snethlage, 1907) - NE Brazil along lower R Tocantins E to Maranhão.



Descriptive notes. 9-10·3 cm; male 7 g, female 6 g. Small flycatcher, rufous overall, with unusually large black eyes, short bill, peaked crown, prominent rictal bristles. Nominate race has crown and nape olive-grey, forehead tinged ochre, faint narrow white eyering and supraloral area, buffy cheek; back grey, tinged olive or brown, rump bright cinnamon; dusky wing-coverts and remiges broadly edged cinnamon-rufous, tail rufous; throat greyish, underparts uniform cinnamon-buff, breast with olive flammulations or tinge; iris black; upper mandible black, lower mandible pale flesh-coloured with dusky tip; legs yellowish-orange to pale brown. Sexes alike. Juvenile is brighter overall, tail darker with dusky tip, darker breast tinged olive. Races similar, varying mostly in coloration of underparts, back and crown, only nominate with distinct olive on breast: *fulvigularis* is perhaps brightest orange-buff below; *hellmayri* has whitish throat contrasting sharply with slightly brighter orange-rufous breast; *venezuelensis* is perhaps paler grey-olive on crown and back; *brunneifrons*, *signatus*, *purusianus* and *amazonus* have throat whitish to buff. Voice. Often quiet but does vocalize throughout day. Call, often repeated at dawn, a high, thin and rather faint "teeu-téép", second note much higher, may recall *Corythopis*, Grey-bellied Spinetail (*Synallaxis cinarescens*) or a hummingbird (Trochilidae). Song insect-like though slightly more musical, a relatively soft, clear and penetrating series of 6-7 high, thin whistles, first 2-3 louder, then accelerating and descending in pitch, "keeek, keeek, eek-eek-eek-eek-eek"; occasionally slowly rising and then falling, "wi wi wi keek...keek, keek keek keek keek". Urgent "pee peew peew peew" in interactions.
Habitat. Lower and middle levels of *terra firme*, *várzea* and secondary forest; also recorded in coconut groves in Brazil. Sea-level to 1200 m.
Food and Feeding. Small insects, especially homopteran bugs. Analysis of 47 prey items taken from stomachs in SE Peru gave: Homoptera (planthoppers 96%); Coleoptera (2%); and Hymenoptera (ants 2%). Usually forages alone, but occasionally joins mixed-species flocks. Searches from perch, in vertical posture, often flicks wings quickly over back; abruptly darts in pursuit of prey, using aerial sallies or hover-gleaning manoeuvres, often continuing to new perch. Frequently vocalizes while foraging.
Breeding. Mar-May in Costa Rica and Feb-Aug in NW Colombia. Nest built by female, an elongated pear-shaped pouch, "visor" protecting side entrance near bottom, generally composed of dark fibres and dead leaf fragments, suspended from vine or twig 1·5-2 m up. Clutch 2 eggs; no information on incubation and fledging periods; chicks cared for by female.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally common. Occurs in many national parks and other protected areas within its relatively large range. Numbers reduced wherever habitat destruction has taken place, but much of habitat occupied by this species remains in fairly pristine condition.
Bibliography. Anon. (1998a), Begazo (1995), Ceballos & Valdelamar (2000), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Lee Jones (2004), Mobley & Prum (1995), Oren & Parker (1997), Parkes & Panza (1993), Payne (1984), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Robinson & Terborgh (1997), Salaman (1994), Sick (1993, 1997), Skutch (1985), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992), Willis (1980), Zimmer (1939a).

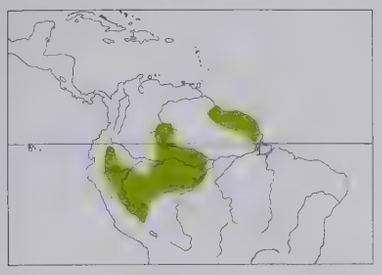
Genus *NEOPIPO* P. L. Sclater & Salvin, 1869

218. **Cinnamon Tyrant**

Neopipo cinnamomea

French: Moucherolle manakin **German**: Zimtbauch-Pipratyrann **Spanish**: Mosquerito Canelo
Other common names: Cinnamon Neopipo/Manakin/Tyrant-manakin

Taxonomy. *Pipra* [*sic*] *cinnamomea* Lawrence, 1869, Chamicuros, Peru.
Formerly considered a manakin and placed in the family Pipridae, but anatomical and other features typical of present family; appears most closely related to a group that includes *Myiophobus*, *Myiobius*, *Terenotriccus*, *Pyrrhomyias* and *Hirundinea*. Validity of race *helenae* questionable; further research required. Two subspecies currently recognized.
Subspecies and Distribution.
N. c. cinnamomea (Lawrence, 1869) - E Ecuador, E Peru, E Colombia, S Venezuela and W & C Amazonian Brazil.
N. c. helenae McConnell, 1911 - the Guianas and N Brazil (Amapá).
Descriptive notes. 9·1-9·5 cm; 7 g. Small, short-tailed flycatcher with large eyes, no rictal bristles. Has dull grey crown with semi-concealed yellow coronal patch, dull grey head side, nape and back, rufous rump; wing feathers dusky with broad rufous edges, tail rufous; throat and underparts buffy to orange-cinnamon, palest on throat; iris dark; bill narrow, black, lower mandible with orange base; legs blue-grey or dusky grey. Distinguished from similar *Terenotriccus erythrurus* by smaller size, short tail and rounded head, dark legs, no rictal bristles. Sexes similar, female duller orange-rufous than male, coronal patch smaller. Races are very similar. Voice. Call a short, wheezy whistled "pfééeo" or "weeo", rising and then falling. Song, often repeated from single perch for 5-10 minutes, a series of 10-15 notes, e.g. "pee pee pa pee... fe-fée-fee-feaa-feaa-feaa-feaa-feaa", slowly



over 5-6 seconds, second note lowest, fifth highest, subsequent notes gradually descending the scale; reminiscent of song of Southern Nightingale-wren (*Microcerculus marginatus*) but faster.

Habitat. *Terra firme* forest, often in areas of white sandy soil in lowlands. Sea-level to c. 1000 m; to 200 m in Venezuela.

Food and Feeding. Arthropods. Forages mostly singly, usually apart from mixed-species flocks; has been observed while foraging with small mixed flock that included *Terenotriccus erythrurus*. Perches in understorey at middle levels or higher; posture usually hunched-looking. Makes frequent rapid sallies to undersides and edges of leaves.

Breeding. No information.

Movements. Probably resident.

Status and Conservation. Not globally threatened. Rare and local throughout range; perhaps often overlooked. Appears to occur at low densities in comparison with other small avian insectivores of forest interior; relatively few records from W Amazonia, and poorly known in Peru. Occurs in Cuyabeno Reserve and Jatun Sacha Biological Station, in Ecuador, and Rio Cristalino Forest Reserve and Tapajós National Park, in Brazil. Much of this species' habitat remains in relatively good condition within its fairly large range, although numbers reduced wherever habitat destruction has taken place.

Bibliography. Álvarez & Whitney (2003), Butler (1979), Carrión & Sibley (1992), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Mobley & Prum (1995), Novaes (1978a), Oren & Parker (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Snyder (1966), Willard *et al.* (1991).

Genus *PYRRHOMYIAS* Cabanis & Heine, 1859

219. **Cinnamon Flycatcher**

Pyrrhomyias cinnamomeus

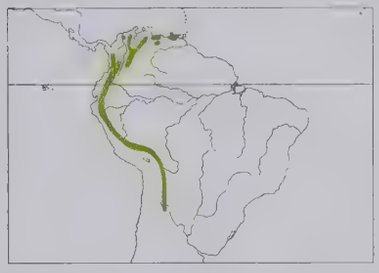
French: Moucherolle cannelle **German**: Zimttyrann **Spanish**: Birro Chico

Taxonomy. *M[uscipeta] cinnamomea* d'Orbigny and Lafresnaye, 1837, Yungas, Bolivia.

Closely allied to *Neopipo* and *Hirundinea*. Differences among races *vieillotioides*, *spadix* and *pariae* appear subtle at best, and these taxa perhaps should be merged; differences between nominate and *pyrrhopterus* also slight, and may reflect clinal variation from N to S within Andes. Six subspecies currently recognized.

Subspecies and Distribution.

P. c. assimilis (J. A. Allen, 1900) - N Colombia (Santa Marta).
P. c. vieillotioides (Lafresnaye, 1848) - NW Venezuela.
P. c. spadix Wetmore, 1939 - mountains of NC & NE Venezuela.
P. c. pariae Phelps, Sr & Phelps, Jr, 1949 - Paria Peninsula, in NE Venezuela.
P. c. pyrrhopterus (Hartlaub, 1843) - Andes of W Venezuela, Colombia, Ecuador and Peru.
P. c. cinnamomeus (d'Orbigny & Lafresnaye, 1837) - Andes of E Peru, Bolivia and NW Argentina.



Descriptive notes. 11-13 cm; 10·8 g. Overall cinnamon-rufous, with peaked crown. Nominate race has dark brownish crown, semi-concealed yellow coronal patch, indistinct buffy supraloral patch and eyering; cheek, nape and upperparts olive-brown, rump with narrow cinnamon-orange band (often hidden); wings black, two broad rufous wingbars, rufous edgings on remiges forming large panel on secondaries; tail blackish; throat, neck side and underparts cinnamon-rufous, slightly paler on belly; iris dark; bill fairly broad, black; legs blackish. Sexes alike. Juvenile is browner, lacks yellow coronal patch, has ochraceous-tipped feathers on lower back and tail. Races vary in plumage, and perhaps best described in three groups: in Andean group, *pyrrhopterus* is very similar to nominate, but differs in having crown tinged olive, back all olive, rump band brighter orange-yellow, also perhaps smaller in size; N group comprises *vieillotioides*, *spadix* and *pariae*, all very similar, differ from nominate group in having reddish-brown crown, rufescent-brown back that may shade to olive on upper rump (just above band), extensive rufous webbing in rectrices, perhaps slightly paler or duller breast, and small amounts of rufous edging at base of primaries; isolated Santa Marta (N Colombia) race *assimilis* is quite distinct from all others, brighter and warmer both above and below (the most cinnamon of all races), crown reddish-brown and more rufous than N group, back orange-rufous, very narrow olive band on upper rump above orange-buff band, rectrices entirely rufous with dark brown subterminal band, primary bases with slightly more rufous than in N group. Voice. Call a rattling trill, "trrrt", "tr-r-r-r-r-r", "pti-i-i-i-i" or "pit, pit-pit-pit", repeated frequently at short intervals; flight call "tjip tjip"; also single "pit", "tsip" or "chip" notes.

Habitat. Clearings, borders and roadcuts in montane forest and woodlands; 600-3550 m, usually 1200-3000 m. In Ecuador occurs on both slopes of Andes and locally above C and inter-Andean valleys.

Food and Feeding. Insects, also some berries. Often forages in pairs; joins, but does not follow, mixed-species flocks. Searches for prey from exposed horizontal perch 1-15 m up on edge of forest, but not in tops of trees; perches upright. An aerial hawker, captures aerial prey in short sallies, abruptly returning to same perch.

Breeding. Apr-May in N Venezuela. Nest an open cup made of moss and lichen, placed 1-5 m above ground in crevice, niche or ledge of rock, fallen log or bark of tree; pair maintains small permanent territory. Clutch 2 eggs; no other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Fairly common to common; one of commonest flycatchers in montane forest. Occurs in Henri Pittier National Park, in Venezuela, Tambito Nature Reserve, in Colombia, and all protected areas in humid Andes from Ecuador S to Bolivia, and in Calilegua National Park, in Argentina. Has unusually wide elevational range; in Ecuador, occurs on both slopes of Andes and locally above C & inter-Andean valleys. Seems fairly adaptable, and persists even in partially deforested regions.

Bibliography. Allen (1998), Baez *et al.* (1997), Bond *et al.* (1989), Canevari *et al.* (1991), Collins & Ryan (1995), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Fitzpatrick (1985a), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Miller (1963), Mobley & Prum (1995), Moynihan (1979), Narosky & Yzurieta (1993), de la Peña (1988), Perry *et al.* (1997), Remsen (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rodewald & Rodewald (2003), Ryan & Collins (1999), Salaman (1994), Schulenberg *et al.* (2001), Stotz *et al.* (1996), Traylor & Fitzpatrick (1982), Walker (2001), Wetmore (1939), Williams & Tobias (1994), Zimmer (1930, 1939b).

Genus *HIRUNDINEA*

d'Orbigny & Lafresnaye, 1837

220. **Cliff Flycatcher**

Hirundinea ferruginea

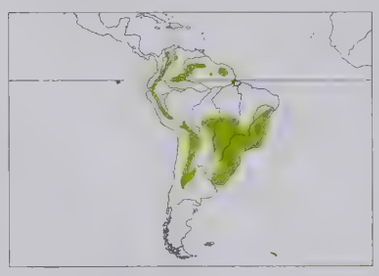
French: Moucherolle hirondelle **German**: Schwalbentyrann **Spanish**: Birro Común
Other common names: Swallow Flycatcher (*bellicosa*)

Taxonomy. [*Todus*] *ferruginea* J. F. Gmelin, 1788, Cayenne.

Closely allied to *Neopipo* and *Pyrrhomyias*. Four subspecies recognized.

Subspecies and Distribution.

H. f. sclateri Reinhardt, 1870 - W Venezuela and S on E slope of E Andes from Colombia to SE Peru (S to Cuzco).
H. f. ferruginea (J. F. Gmelin, 1788) - Disjunctly in extreme E Colombia (R Vaupes), NW Brazil (NW Amazonas), SE Venezuela (Bolívar), SW Guyana and French Guiana.
H. f. pallidior Hartert & Goodson, 1917 - N & E Bolivia, W Paraguay and NW Argentina (S to La Rioja and Córdoba).
H. f. bellicosa (Vieillot, 1819) - S & E Brazil, E Paraguay, NE Argentina (Misiones) and Uruguay.



Descriptive notes. 15·5-18·5 cm; 21 g. Long, slender tyrannid reminiscent of a swallow (Hirundinidae), with short rictal bristles, long pointed bill broad at base, short legs; triangular wings in flight. Nominate race has crown and upperparts blackish-brown, cheek mottled white, whitish short supercilium, dark loral stripe; wings blackish when folded (sometimes showing rufous inner webs as panel in secondaries or inner primaries), in flight primaries and secondaries with broad rufous band bordered by blackish feather tips; tail blackish above, inner webs rufous (except on central rectrices), cinnamon-rufous only at base below; chin mottled grey, throat and underparts, including underwing-coverts, uniform cinnamon-rufous; iris dark; bill blackish; legs black. Sexes similar. Races vary in coloration of, especially, crown and chin, wings and tail: *sclateri* is much like nominate, but with more extensive white mottling on head, especially forehead and crown, paler chin, more extensive rufous on inner webs of underside of rectrices; *bellicosa* is more rufous-brown above (rather than dark chocolate-brown), cheeks and chin brown with dusky mottling, conspicuous orange-brown rump and basal half of uppertail, conspicuous rufous edging and panel on closed wing, margins of wing-coverts and tertials buff to pale brown; *pallidior* resembles previous, but rufous margins in wing slightly wider, rufous extends less far down tail (creating broader dark subterminal band). Voice. Frequently gives high-pitched calls or single or repeated notes described as "wheeeyp", "killy killy", "kaleé kale" or "wha-deép wha-deép"; dawn song a repeated rapid high "kit-ti-léé".

Habitat. Cerros, cliffs, rocky outcrops, canyon walls, landslides and steep banks bordered by mature and secondary forest, as well as similar, man-made habitats such as roadcuts, bridges and quarries; also more sparsely wooded slopes or dry valleys in Bolivia, and uses ledges and facades of buildings in Brazil. Lowland populations occur from sea-level to 2000 m; Andean populations mainly 900-2000 m, but locally as high as 3900 m in Bolivia.

Food and Feeding. Insects. Often forages in pairs or family groups. Unique in family, captures prey by hawking in spectacular, powerful, long aerial sallies; usually returns to same perch; swoops and glides in flight much like a swallow. Usually perches horizontally, searching for prey from exposed perch on rocky outcrop, cliff face, overhanging branch or twig, small bush or tree growing out of cliff face, or large canopy tree bordering cliff; also from wires and buildings in urban areas.

Breeding. Nest found in Nov in Argentina; juvenile reported in Dec in Bolivia (Cochabamba). Nest an open cup made of grass, one with internal diameter 7 cm, external diameter 9 cm, depth 2 cm, placed in crevice or on ledge of cliff or roadcut. Clutch 2 eggs; no information on incubation and fledging periods; distraction display by adults when nest threatened.

Movements. Mainly resident. S breeders migrate during austral winter, sometimes far from typical habitat.

Status and Conservation. Not globally threatened. Fairly common but local. Probably increasing and spreading into artificially created habitats associated with newly constructed roads. Occurs in Alto Orinoco-Casiquiare Biosphere Reserve and Canaima National Park, in Venezuela, Machu Picchu Historical Sanctuary, in Peru, Noel Kempff Mercado National Park, in Bolivia, Aparados da Serra, Itatiaia, Serra da Canastra and Tijuca National Parks, all in Brazil, and Cerro Corá National Park, in Uruguay.

Bibliography. Canevari *et al.* (1991), Clements & Shany (2001), Cory & Hellmayr (1927), Davies *et al.* (1994), Fitzpatrick (1985a), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Flores & Capriles (1998), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Joseph (1996), Mobley & Prum (1995), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1987, 1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor & Fitzpatrick (1982), Walker (2002), Zimmer (1930).



Genus *LATHROTRICCUS*

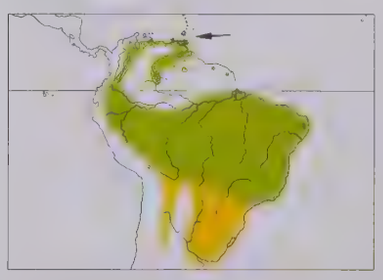
W. E. Lanyon & S. M. Lanyon, 1986

221. **Euler's Flycatcher**

Lathrotriccus euleri

French: Moucherolle d'Euler **German**: Euler-Schnäppertyrann **Spanish**: Mosquero de Euler

Taxonomy. *Empidochanes Euleri* Cabanis, 1868, Cantagalo, Rio de Janeiro, Brazil.
Genus formerly included within *Empidonax*. If present species is included in *Empidonax*, name *flaviventris* becomes preoccupied, and must give way to *johnstonei* for Grenada birds; those from Trinidad also, independently, named as *flavirostris* (by same author, in same year!), but that name, preoccupied in both genera, gives way to *lawrencei*. Five subspecies recognized.
Subspecies and Distribution.
L. e. flaviventris (Lawrence, 1887) - Grenada, in S Windward Is (probably extinct).
L. e. lawrencei (J. A. Allen, 1889) - Trinidad, W & N Venezuela, locally E Colombia, also casually Surinam and French Guiana.
L. e. bolivianus (J. A. Allen, 1889) - S & SE Venezuela, E Ecuador, E Peru, much of Brazil (except N & SE) and NW Bolivia; some possibly migrate to Colombia.
L. e. argentinus (Cabanis, 1868) - E Bolivia, N Argentina and Paraguay; migrates N into Amazonia of E Peru and E Brazil.
L. e. euleri (Cabanis, 1868) - SE Brazil, NE Argentina and Uruguay ; migrates N into Amazonia of NE Peru, Bolivia and Brazil.



Descriptive notes. 12·7-13·5 cm; 11 g. Generally drab, similar to some *Empidonax* species, but browner above and buffier wingbars. Nominate race has warm olive-brown crown, whitish eyering and indistinct supraloral stripe; cheek, nape and back olive-brown, rump brown; wings dusky, two pale buff wingbars, pale buffy-brown margins of secondaries and tertials; tail dusky; throat greyish-white, breast washed brownish-olive, belly pale yellow to white; iris dark; upper mandible black, lower mandible flesh-coloured; legs blackish-brown. Sexes similar. Races vary in size and colour: *argentinus* is similar to nominate but with whitish throat, drabber grey breast, white belly; *lawrencei* is more olive above, breast olive-grey, yellower on belly; *bolivianus* is slightly less olive above than previous, pale olive-grey breast,

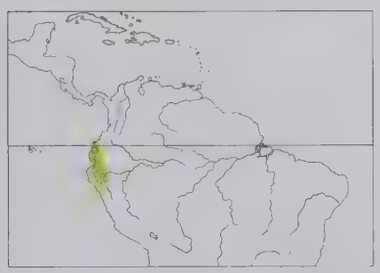
perhaps less yellow belly, juvenile browner than adult and with slightly buffier wingbars; *johnstonei* is little known, generally similar to nominate except that wingbars vary to more reddish-brown than buff, breastband greyer. Voice. Song an abrupt and buzzy "fééú! pe'pe'pe'p'p", first note loudest and second part descending scale; also described as fast burry "peeeur, peer-per-per-peeur", sometimes limited to just first note, or even faster versions as "peeeur, peepiti" or "bew-bewee"; in Brazil, song described as "shpaye-shpaye-wileh" and call is a muffled "béách-bich".
Habitat. Lower levels of moist and humid forest, secondary growth, and open forest borders; sometimes in bamboo thickets. From sea-level to 1500 m, possibly higher in some locations.
Food and Feeding. Arthropods, especially beetles (Coleoptera), ants (Hymenoptera), homopteran bugs (planthoppers and cicadas), and assorted dipterans, Hemiptera and arachnids. Generally alone or in pairs; rarely joins mixed-species flocks. Searches for prey from low, usually inconspicuous perch in shady undergrowth; captures prey by sallying to foliage, returning to same perch or moving to new one.
Breeding. Breeds May-Jul in Trinidad, Sept-Nov in Brazil and Oct-Nov and Jan in Argentina. Nest a cup lined with soft black fibres, one with external diameter 5 cm, height 6 cm, internal depth 2·5 cm, placed generally 1-2 m up on branch or in fork, or over small hole or knothole. Clutch 2-3 eggs; no information on incubation and fledging periods.
Movements. Mainly resident. Race *argentinus* and S populations of nominate migrate N into Amazonia during austral winter, becoming locally numerous in SE Peru; austral migrants possible, but hitherto unrecorded, in Venezuela and Ecuador; timing, routes and boundaries of migration not well understood.
Status and Conservation. Not globally threatened. Uncommon to locally common; becomes less numerous and widespread in N part of range, e.g. much more scarce in Colombia and Ecuador. Grenada race (*flaviventris*) not recorded since 1950, probably extinct. Otherwise, because of the species' large range, it occurs in many national parks and other protected areas, e.g. Tambopata-Candamo Reserved Zone and Manu National Park and Biosphere Reserve, in Peru, Beni and Pilón Lajas Biosphere Reserves and Madidi and Noel Kempff Mercado National Parks, in Bolivia, Cerro Corá National Park, in Uruguay, and Calilegua National Park, in Argentina, as well as in seven national parks in Brazil and four in Paraguay. Regularly seen above Maracay, along Choroní road in Venezuela.
Bibliography. Aguilar *et al.* (1999), Anon. (1998a), Banks (1997), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Di Giacomo (2004), Faaborg (1985), ffrench (1991), Fitzpatrick (1980a), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Joseph (1996), Klimaitis & Moschione (1987), Lanyon & Lanyon (1986), Lowen *et al.* (1996), Miserendino (1998), Narosky & Salvador (1998), Oren & Parker (1997), de la Peña (1988), Perry *et al.* (1997), Raffaele *et al.* (1998), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Temple (2002), Tostain *et al.* (1992), White (2002), Zimmer (1930, 1939a).

222. **Grey-breasted Flycatcher**

Lathrotriccus griseipectus

French: Moucherolle à poitrine grise **Spanish**: Mosquero Pechigrís
German: Graubrust-Schnäppertyrann

Taxonomy. *Empidonax griseipectus* Lawrence, 1870, Puná Island, south Ecuador.
Genus formerly included within *Empidonax*. Monotypic.
Distribution. W slope of Andes in W Ecuador, and N Peru.



Descriptive notes. 13 cm; 11 g. Has grey crown, whitish broken eyering and supraloral stripe; cheek, nape, back and rump grey with slight brown or olive tinge; wings dusky, two well-marked whitish wingbars, whitish margins of secondaries and tertials; tail dusky; throat greyish-white, breast washed darker grey, belly white to whitish with pale yellow tinge; iris dark; upper mandible black, lower mandible pale orange-yellow; legs blackish. Sexes similar. Voice. Song a variable and fast burry "peeéur, peer-per-per-pur", similar to that of *L. euleri*.
Habitat. Lower levels of humid and deciduous forest; sea-level to 2200 m, mainly below 1700 m, most numerous below 800 m.
Food and Feeding. Insects. Perches inconspicuously, at up to 4 m, in shady vine tangles and vegetation near sunlit forest gaps; captures prey with sallies out to air. Occasionally observed at army-ant swarms.
Breeding. Little known. Probably breeds during wet-season, Jan-May; immatures recorded in Mar.
Movements. Little information; some seasonal movement thought to occur, with some birds moving to more humid forest during dry season.
Status and Conservation. VULNERABLE. Restricted-range species: present in Tumbesian Region EBA and Marañón Valley EBA. Rare to locally fairly common. Range c. 13,800 km², and estimated population 2500-10,000 individuals and declining. Occurs at c. 36 localities in W Ecuador (in Esmeraldas, Pichincha, Manabí, Los Ríos, Guayas, Cañar, Azuay, El Oro and Loja) and NW Peru (in Tumbes, Piura, Lambayeque and Cajamarca). In Ecuador, the species is found regularly in Cerro Blanco Forest Reserve and Río Palenque Science Centre, is fairly common in Machalilla National Park, and is very common (up to 3 pairs/ha) in vine-rich forest at Jauneche Biological Reserve Station; Peruvian stronghold is the Northwest Peru Biosphere Reserve, where up to 6 individuals recorded per day. Recently recorded in Ecuador also at Manglares-Churute Ecological Reserve, at Manta Real (designated for protection), near Guayaquil, and fairly common at Loma Alta Ecological Reserve and Hacienda González (a private property in Cordillera de Chongón); the 776-km² partially forested Chongón-Colonche Protection Forest, which forms nucleus of a reforestation project, may also support the species. Habitat is threatened by illegal settling, deforestation and livestock grazing, even within protected areas. Forest below 900 m is especially threatened in this region, having undergone deforestation rates of 57% per decade from 1958 to 1988; losses continue, and threaten to eliminate all lowland forest outside protected areas in the region. Further conservation efforts within protected areas and research aimed at establishing a better understanding of this species' distribution, ecology and movements are recommended.
Bibliography. Begazo *et al.* (2001), Best & Clarke (1991), Best & Kessler (1995), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Cracraft (1985), Hilgert & Benavides (2002), Meyer de Schauensee (1982), Parker & Carr (1992), Parker *et al.* (1995), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996), Wege & Long (1995), Williams & Tobias (1994).

Genus *APHANOTRICCUS* Ridgway, 1905

223. **Tawny-chested Flycatcher**

Aphanotriccus capitalis

French: Moucherolle à poitrine fauve **Spanish**: Mosquero Pechileonado
German: Ockerbrust-Schnäppertyrann

Taxonomy. *Myiobius capitalis* Salvin, 1865, Tucurrique, Costa Rica.
Monotypic.
Distribution. Caribbean slope of E & SE Nicaragua and N Costa Rica.



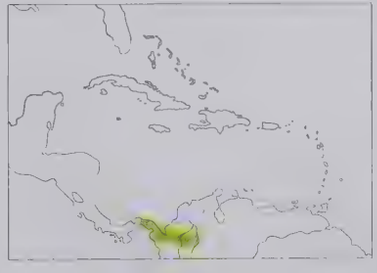
Descriptive notes. 12 cm; 11 g. Resembles an *Empidonax* in appearance and posture, but more brightly coloured. Male has crown dark grey, dark lores, white supraloral stripe and broken eyering, greyish-olive cheek; nape and back olive-green, tinged ochraceous, rump olive-green; wings dusky, two bright ochraceous wingbars, ochraceous margins of secondaries and tertials; tail dusky olive; throat white, tinged buff at side, breast bright cinnamon-ochre, belly and undertail-coverts yellow; iris dark; upper mandible black, lower mandible pinkish or flesh-coloured at base, rest black; legs grey. Female has crown more olive-tinged. Juvenile not well known. Voice. Song a rapid "chee chee spt't cheew" or "chit it-it chee'yew", last note loudest; sometimes more extensive "choot choot choot ch-ch-ch-chttttree'ih", similar to song of Grey-headed Piprites (*Piprites griseiceps*).
Habitat. Dense vegetation near edges, natural clearings or streams within humid and mature secondary forest; also cacao plantations. Lowlands and foothills from sea-level to 900 m, locally to 1050 m.
Food and Feeding. Insects, especially beetles (Coleoptera), bugs (Hemiptera) and ants (Hymenoptera). Forages alone or in pairs, following regular routes; forages low in dense vegetation, using upward sallies to capture prey from undersides of leaves and branches. May spread and close tail upon landing.
Breeding. Little known. Apparently a crevice-nesting species; nests recorded c. 6 m above ground in hollows of large bamboo (*Guadua*) and non-native bamboo (*Alchornea*). No other information.
Movements. Resident.
Status and Conservation. VULNERABLE. Restricted-range species: present in Central American Caribbean Slope EBA. Rare to uncommon, and local. Occurs within small range of c. 8000 km²; population estimated at fewer than 10,000 individuals, and declining as a result of extensive forest clearance and fragmentation. Although this species has been found in cacao plantations and similar areas, it does not persist in small forest fragments; threatened, therefore, by habitat destruction and fragmentation due to logging, banana cultivation and cattle-ranching. So far, all Nicaraguan records are based on historical specimens, but it potentially occurs within Río Indio-Maíz Biological Reserve. In Costa Rica, it is protected within Rincón de la Vieja National Park, La Selva Biological Reserve and Rancho Naturalista, and possibly occurs also within Braulio Carillo National Park; Rancho Naturalista is an ecotourism lodge, where the species receives protection under current management practices. Improved knowledge of its distribution, especially in Nicaragua, may result in the species' conservation status being downgraded to that of Near-threatened.
Bibliography. Anon. (1998a), Collar *et al.* (1994), Cory & Hellmayr (1927), Eisenmann (1955), Fitzpatrick (1980a), Howell (1957), Ridgway (1907), Slud (1960, 1964), Stattersfield & Capper (2000), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Young & Zook (1999).

224. **Black-billed Flycatcher**

Aphanotriccus audax

French: Moucherolle à bec noir **Spanish**: Mosquero Piquinegro
German: Schwarzschnabel-Schnäppertyrann

Taxonomy. *Praedo audax* Nelson, 1912, Cana, 2000 feet [c. 600 m], E Panama.
Monotypic.
Distribution. E Panama S locally to N Colombia.



Descriptive notes. 13·2 cm. Rather slender tyrannid; resembles *Empidonax* but bill and supraloral coloration distinctive and posture different. Male has crown olive-grey, shading to bright greenish-olive on back; white supraloral stripe and narrow broken eyering; wings dusky, two pale buff wingbars, short primary projection; tail relatively long, dusky brown; throat and underparts white, broad and indistinct olive wash on breast, becoming yellower on lower breast and belly; iris dark; bill short, black; legs blackish. Female and juvenile not well known. Voice. Song, given infrequently, a loud, sharply enunciated but wheezy or burry "bee béé, be-be-be-bez", "jee-jee-jew" or fainter "bee-beez-bez-baw".

On following pages: 225. Belted Flycatcher (*Xenotriccus callizonus*); 226. Pileated Flycatcher (*Xenotriccus mexicanus*); 227. Fuscous Flycatcher (*Cnemotriccus fuscatus*).

Habitat. Low and dense vegetation near streams and swamps within humid and mature secondary forest; sea-level to 600 m, usually from 100 m, and occasionally to 700 m.
Food and Feeding. Insects. Usually in pairs, often inconspicuous, and does not usually join mixed-species flocks. Perches 1-4 m up, searching for prey; often perches more horizontally than do *Empidonax* species. Captures prey by sallying or fluttering short distances to foliage, then continuing on to new perch.
Breeding. Male in breeding condition in Mar-Apr; juvenile observed late Jun. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Darién Lowlands EBA and Nechí Lowlands EBA. Uncommon to locally common, but perhaps often overlooked. Appears to be declining as a result of habitat destruction and conversion to agriculture following road-building. In Panama, found in Darién National Park and recorded regularly along Boca de Cupe trail near Cana (E Darién); fairly common in Río Verde del Sinú, in Colombia.
Bibliography. Anon. (1998a), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Eisenmann (1955), Haffer (1975), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996), Wetmore (1972).

Genus *XENOTRICCUS* Dwight & Griscom, 1927

225. **Belted Flycatcher**

Xenotriccus callizonus

French: Moucherolle ceinturé **German**: Brustband-Schnäppertyrann **Spanish**: Mosquero Fajado

Taxonomy. *Xenotriccus callizonus* Dwight and Griscom, 1927, Panajachel, 5500 feet [c. 1675 m], Lake Atitlán, Guatemala.
Monotypic.
Distribution. Interior and adjacent Pacific slope of S Mexico (Chiapas) S locally to NW El Salvador.



Descriptive notes. 11·5-12·5 cm. Distinctive, crested flycatcher. Has olive crown with usually obvious spiked erectile crest; pale lores and pale lemon, teardrop-shaped eyering; nape greyish-olive, upperparts brownish-olive; wings dusky, two cinnamon wingbars, cinnamon margins of remiges forming panel on secondaries (but bases of remiges dark); tail dark grey-brown, outer webs of outer rectrices pale grey; throat whitish, broad cinnamon band across breast, contrasting pale lemon belly; iris dark; upper mandible black, lower mandible orange-flesh; legs dark grey. Sexes similar. Juvenile is similar to adult, but crest shorter. Voice. Call a buzzy nasal "rreah" or "choi-ih", sharper "cheuh" and burry "pi'kweehr"; song an accelerating and often quickly repeated "pic pi-pi-pi-pi-chi-i-weer" or "chi-chi-chi-chi-i-ir".
Habitat. Understorey of dense, scrubby woodland, especially with oaks (*Quercus*); highlands from 1200 m to 2000 m.
Food and Feeding. Insects. Usually remains well hidden, and best detected by voice. Forages by searching from low perch, and then sallying out to capture prey from the air or foliage.
Breeding. Nest a cup made of fine grass and other plant fibres, placed low in fork of shrub. Clutch 3 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in North Central American Highlands EBA. Uncommon and locally distributed, with small range in S Mexico, Guatemala and extreme NW El Salvador. Most common at El Sumidero, in Chiapas (Mexico), and not well known beyond this location. Habitat is threatened by widespread logging and by conversion for coffee cultivation, as well as by uncontrolled fires.
Bibliography. Anon. (1998a), Blake, E.R. (1953), Ceballos & Valdelamar (2000), Collar *et al.* (1994), Eisenmann (1955), Fitzpatrick (1980a), Howell & Webb (1995a), Land (1970), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stotz *et al.* (1996), Thurber *et al.* (1987).

226. **Pileated Flycatcher**

Xenotriccus mexicanus

French: Moucherolle aztèque **Spanish**: Mosquero del Balsas
German: Schopfschnäppertyrann
Other common names: Crested Wood Pewee

Taxonomy. *Aechmolophus mexicanus* J. T. Zimmer, 1938, Cuernavaca, 5000 feet [c. 1525 m], Mexico.
Monotypic.
Distribution. SW Mexico, from C Michoacán and Morelos E to Oaxaca (W of Isthmus of Tehuantepec); recently found in NW Guatemala.
Descriptive notes. 13·5-14·5 cm. Distinctive, crested flycatcher, similar to *Empidonax* but more heavily built, longer-tailed, stouter-billed. Has greyish or brownish-olive crown with spiky erectile crest (usually raised, sometimes held flat); pale lores and white teardrop-shaped eyering; nape and upperparts greyish or brownish-olive; wings darker than back, two whitish wingbars, whitish margins of remiges forming indistinct panel on secondaries; tail dusky; throat white, breast washed grey, belly white with yellow tinge; iris dark; upper mandible black, lower mandible orange-flesh; legs dark grey. Sexes similar. Juvenile has shorter crest than adult, wingbars and margins of remiges buff; attains adult plumage quickly. Voice. Calls include nasal "brree" notes, richer more explosive "checoo" or "cheeup" notes, also harsher "whee whee-eu' whee-eu' whee-eu" possibly as alarm; song, from conspicuous perch, sputtered and intensifying "p'iweer pi-pi-pirrr-i-it' cheeu", or "wheeu whirr-rr-rr-rr-whee-u" reminiscent of a sport referee's whistle.
Habitat. Low to middle levels of arid montane scrub, mesquite and thorn-forest, occasionally in semi-open overgrazed areas; usually 900-2000 m.



Food and Feeding. Insects. Forages by searching from low perch, in fairly erect posture; jerks tail up in manner of *Empidonax oberholseri*. Sallies out to capture prey from the air or foliage; flight direct and heavy.
Breeding. Nest made of grasses and other plant fibres, often with trailing grass streamers, saddled in fork low in thorny thicket, and bound to fork by spider silk. Clutch 2-3 eggs. No other information.
Movements. Movements not well known. Mostly resident, but may descend in winter to lower elevations of the Balsas drainage; e.g. common at Monte Alban (Oaxaca) during summer, but rare or absent in winter.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Balsas Region and Interior Oaxaca EBA. Recent record from Laguna del Tigre National Park, in Guatemala, thus considerably extending its range. Habitat threatened by expansion of cattle-ranching and of coffee and citrus plantations. Very few protected areas exist within its small range.
Bibliography. Anon. (1998a), Blake, E.R. (1953), Ceballos & Valdelamar (2000), Collar *et al.* (1994), Fitzpatrick (1980a), Howell & Webb (1995a), Hutto (1992), Rowley (1984), Stattersfield & Capper (2000), Stotz *et al.* (1996).

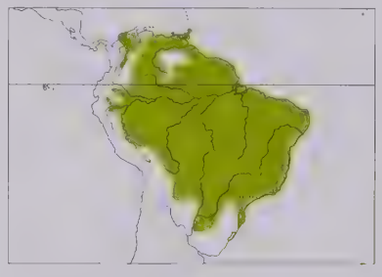
Genus *CNEMOTRICCUS* Hellmayr, 1927

227. **Fuscous Flycatcher**

Cnemotriccus fuscatus

French: Moucherolle fuligineux **Spanish**: Mosquero Parduzco
German: Augenstreif-Schnäppertyrann

Taxonomy. *M[uscipeta] fuscata* Wied, 1831, no locality = probably Rio de Janeiro, Brazil.
Probably most closely related to *Lathrotriccus*. Some authorities suggest that more than one species may be involved, because of variation in plumage, voice and behaviour (particularly with regard to races *duidae* and *bimaculatus*); conversely, some races possibly unwarranted; further research required in order to clarify true taxonomic status of races. Seven subspecies currently recognized.
Subspecies and Distribution.
C. f. cabanisi (Léotaud, 1866) - N & E Colombia, and NW & N Venezuela, Trinidad, Tobago, Monos I and Chacachacare I.
C. f. duidae J. T. Zimmer, 1938 - S Venezuela and NW Brazil.
C. f. fumosus (Berlepsch, 1908) - the Guianas and NE Brazil.
C. f. fuscatior (Chapman, 1926) - SW Venezuela, SE Colombia, E Ecuador, E Peru and C Brazil.
C. f. beniensis Gyldenstolpe, 1941 - N Bolivia.
C. f. bimaculatus (d'Orbigny & Lafresnaye, 1837) - C Bolivia, S & E Brazil, Paraguay and N Argentina.
C. f. fuscatus (Wied, 1831) - SE Brazil and NE Argentina.



Descriptive notes. 13·5-15 cm; 11·9 g. Nominate race has crown and upperparts plain brown with slightly rufescent tone; whitish supraloral line and long thin supercilium extending behind eye, contrasting dusky lores and eyeline; wings dusky, two broad buffy wingbars, inner secondaries narrowly edged buff, tertials edged whitish; tail unusually long, dusky, edged brown; throat whitish, breast olive-grey or greyish-brown, belly pale yellow; iris blackish; bill long, narrow, mostly black, base of lower mandible pale flesh-coloured; legs black. Sexes similar. Juvenile not well known. Races vary mainly in extent of supercilium, extent and intensity of wingbars, colour of upperparts (from greyish to brownish) and colour of belly (from whitish to yellowish): *cabanisi* has two colour phases, one with greyish upperparts and white belly (apparently more numerous in interior of Venezuela), other with brown upperparts and yellow belly (more numerous in coastal and Tobago populations); *fumosus* is supposedly intermediate between previous and following races; *bimaculatus* is similar to nominate but with dull brownish-grey breast and white belly; *beniensis* resembles last; *duidae* has dark brown crown and back, rich olive-brown breast, pale yellow belly, and lower mandible entirely pale orange-yellow; *fuscatior* has dark brown crown and back similar to last, but breast less rich olive-brown, belly perhaps yellower, bill all dark. Voice. Call a muffled "aag-aag-aag" or frog-like "bsh-bsh-bsh" in Brazil; "feétz-beeu" in Venezuela, also as "pfééó" and "pfeeu-pfeeu-pfeea" in SE Sucre. Song a quick buzzy "jaw-jew-jew-jew jew" in Venezuela (Apure); elsewhere in range, a series of clear notes varying from "chip, weety-weety-weety, cheedip" to "chewy-chewit-cheepeer"; *bimaculatus* gives distinct single whistled "ooooooee", rising at end. Dawn song a rolling "pü-breeer-breeer" in Venezuela (Apure); in Andes, series of excited "p-pit-pit-péédit" phrases; high clear dawn song of *duidae* distinct, loud and whistled "chueeeeeeééééchueeét" or "chueeéé" and softer "chuéééchee", repeated. Often vocalizes late into morning or midday hours.
Habitat. Shady and thick undergrowth vegetation in variety of habitats, often near water, including thickets within dry, humid and gallery forests, second growth, *várzea*, and on river islands. Sea-level to 900 m, mainly below 500 m; below 250 m S of Orinoco in Venezuela; race *bimaculatus* recorded to 2400 m in Bolivia (La Paz).
Food and Feeding. Insects. Forages quietly, alone or in pairs (partners well separated), rarely joining mixed-species flocks. Searches from perches usually from near ground to 3 m up, sometimes higher; fairly horizontal posture (unlike *Empidonax*). Captures prey by sallying short distances to foliage or ground, sometimes hover-gleaning insects from underside of leaves.
Breeding. Apr-May in Trinidad, and nests found in Feb and Jul in Tobago; nest with egg in Nov in Argentina; nest-building and nests with chick in Nov in Brazil. In Trinidad, nest a cup made of twigs and bark, lined with black fibres, placed 3 m up in tree fork. Clutch 3 eggs. No other information.

Movements. Mainly resident. Details of any migratory behaviour generally not well known. S Brazilian populations believed to be migratory; race *bimaculatus* recorded at high elevations in La Paz (Bolivia) in Sept-Oct, and rare during austral winter in Paraguay.
Status and Conservation. Not globally threatened. Uncommon to common, and widespread in much of South America E of Andes. Accepts a variety of wooded habitats, and therefore occurs in many national parks and other protected areas throughout its extensive range.

Bibliography. Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Di Giacomo (2004), ffrench (1991), Fitzpatrick (1980a), Fjeldså & Krabbe (1990), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hilty (2003), Hilty & Brown (1986), Lowen *et al.* (1996), Miserendino (1998), Narosky & Salvador (1998), Oren & Parker (1997), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), do Rosário (1996), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Tostain *et al.* (1992), Zimmer (1938).


228
229
230
231
232
233
234
235
236
ssp affinis
ssp pulverius
ssp difficilis
239
237
238
ssp flavescens
240
ssp bairdi
ssp insulicola
ssp salvini
ssp fulvifrons
241
ssp fusciceps
242
PLATE 32
inches
3
cm
8

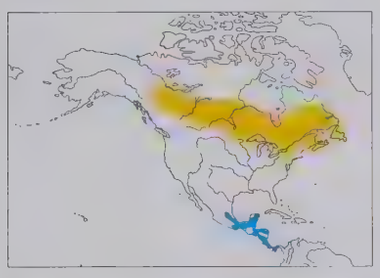
Genus *EMPIDONAX* Cabanis, 1855

228. Yellow-bellied Flycatcher

Empidonax flaviventris

French: Moucherolle à ventre jaune **Spanish**: Mosquero Ventriamarillo
German: Birkenschnäppertyrann

Taxonomy. *Tyrannula flaviventris* W. M. Baird and S. F. Baird, 1843, near Carlisle, Pennsylvania, USA.
Suggested as possibly closest to *E. wrightii* and *E. difficilis*/*E. occidentalis*. Monotypic.
Distribution. Breeds W Canada from C & N British Columbia and WC & S Mackenzie E to Newfoundland, Prince Edward I and Nova Scotia, and S into NE USA (E from N Minnesota and Great Lakes region, S into Pennsylvania, C New York, and disjunctly in West Virginia). Winters from SE & SW Mexico (on Caribbean slope from S Tamaulipas, on Pacific slope from Oaxaca) S to W Panama.



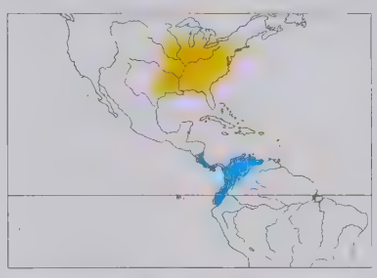
Descriptive notes. 12·5-15 cm; 9-16 g. Adult has rounded crown greenish-olive, slightly crested; pale olive supraloral area, pale yellow complete eyering; head side, nape and back greenish-olive, rump olive-green; wings blackish-brown, two broad wingbars white to pale yellow, white to pale yellow margins on secondaries and tertials (forming pale panel on secondaries of closed wing); moderate primary projection; tail relatively short and narrow, rectrices dusky brown, edged greenish-olive; throat yellow, breast extensively washed olive, belly and undertail-coverts yellow; plumage varies with wear, brightest green above and yellowish on wing margins and below in spring (fresh plumage), drabber olive above with whiter wing margins and paler and whiter below by late summer (worn plumage); iris dark; bill short, broad, upper mandible black, lower mandible pinkish-yellow, mouth-lining orange; legs dark grey, feet blackish. Distinguished from *E. virescens* by smaller bill, wing morphology (especially shorter primary projection), shorter tail, yellower underparts, brighter mouth coloration; from *E. difficilis* and *E. occidentalis* by brighter upperparts, wing morphology, more rounded eyering. Sexes similar. Juvenile is similar to adult, but wingbars with buffy tinge. Voice. Song, often from prominent perch 3-10 m up, an abrupt "killionk" or "che-bunk", also described as e.g. "killic", "pee-wick", "pse-ek", "che-lek", "pschee-ik" or similar, or as more leisurely "peeup" or "pee-eep"; also shorter "sclek", "psek" or "kik" version of song, reminiscent of call of Downy Woodpecker (*Picoides pubescens*). Call an ascending whistled "tu-wee", also by female from nest; abrupt burry "brrrt", "prit" or "chirr" in flight during aggressive encounters, territorial conflicts (both during breeding and in winter), and after prey capture; also a "chip" note. Bill-snapping reported during aggressive encounters.
Habitat. Breeds in coniferous and mixed forests, bogs, swamps and muskegs, often in moist areas with thick moss and dense undergrowth; dominant trees include black spruce (*Picea mariana*), balsam fir (*Abies balsamea*), hemlock (*Tsuga*), pine (*Pinus*) or larch (*Larix*), and understorey shrubs include blueberry (*Vaccinium*), swamp azalea (*Rhododendron viscosum*), sheep laurel (*Kalmia angustifolia*), Labrador tea (*Ledum groenlandicum*), heaths (Ericaceae) and others. Restricted to higher elevations where appropriate spruce or bog habitat persists in S portion of breeding range (in the Catskills, Adirondacks, Tug Hill Plateau, Appalachians). During migration, inhabits dense vegetation in riparian and upland deciduous forests. In winter, inhabits dense vegetation in variety of habitats including rainforest, montane evergreen forest, pine-oak forests, forest borders, and secondary forest, sometimes near streams; also reported from palm forests and plantations of coffee and cardamum in Guatemala; fares better in shade coffee than in sun-grown coffee.
Food and Feeding. Insects and other arthropods; occasionally fruit. On breeding grounds, diet includes flying ants (Hymenoptera), small beetles (Coleoptera), dipterans including midges (Chironomidae), stoneflies (*Lectuira*), craneflies (Tipulidae) and mosquitoes (Culicidae), also spiders (Araneae), larval lepidopterans, bugs (Hemiptera); fruit includes poison ivy (*Rhus radicans*). Perches upright, occasionally jerks tail up. Forages in understorey, by searching from perch; prey captured from air, foliage or occasionally the ground, by hawking, sallying or gleaning; usually returns to a new perch.
Breeding. Late May to early Aug. Nest constructed by female, a hollowed-out depression lined with grass, black rootlets and conifer needles, average outside diameter of nest cup 8·13 cm, depth 9·6 cm, inside diameter 5·3 cm, depth 4·0 cm; on or near ground in cool, moist shady place, hidden from above by dense vegetation (including moss, herbs, sedges, ferns, shrubs and small trees), often imbedded in *Sphagnum* moss or at base of ferns, or under tree roots, embankment, within log or at base of overleaning tree trunk. Clutch 3-5 eggs, usually 4; incubation period 15 days; fledging period 13 days. Breeds in first season after hatch. Longevity record 4 years (based on 16 recoveries).
Movements. Long-distance migrant, wintering in Central America. Migrates at night through E USA to C Great Plains and C Texas. Departs breeding grounds late Aug to late Sept, passing through Mexico Aug-Sept, through Costa Rica late Aug-Oct, and arriving Panama by Sept; leaves wintering grounds in Costa Rica Mar to mid-May, Panama by late Apr, migrating through Mexico Apr-May. Rare transient in Cuba during Apr. Vagrants reported from W North America and Greenland. Longer-winged male tends to arrive on breeding grounds 4 days earlier than female.
Status and Conservation. Not globally threatened. Fairly common. Difficult to census owing to inaccessible breeding habitat, but global population estimated at 6,200,000 individuals. Population trends appear mixed and subtle. Average densities may reach 30 territorial males/km² in spruce forests with no budworm infestation in Ontario, whereas density may be 50% lower in mature red spruce forest in Maine or young spruce forest in Nova Scotia. Common in continuous habitat in Canada, one of the most common birds in balsam-fir forests in Newfoundland; perhaps less secure in more fragmented range in NE USA, where spruce die-offs, acid rain and ski-resort development may have reduced available habitat. Although tolerant of modest habitat disturbance on non-breeding grounds, loss of forest through conversion for agriculture in much of the tropics is of concern for this species; wintering populations near Tuxtla Mts (Veracruz), in Mexico, have declined as a result of habitat conversion.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Beal (1912), Bent (1942), Binford (1989), Brunton & Crins (1975), Campbell *et al.* (1997), Cory & Hellmayr (1927), Cyr & Larivée (1995), DeGraaf & Rappole (1995), Dunn *et al.* (1999), Erskine (1977), Fitzpatrick (1980a), Garrido & Kirkconnell (2000), Greenberg *et al.* (1997), Gross & Lowther (2001), Hespenheide (1980), Howell & Webb (1995a), Johnson (1963a), Kaufman (1990, 1996), Lee Jones (2004), Mengel (1965), Monroe (1968), Peck & James (1987, 1997), Peterjohn *et al.* (1995), Peterson (1988b), Petit *et al.* (1993), Prescott (1987), Price *et al.* (1995), Pyle (1997b), Raffaele *et al.* (1998), Ramos (1988), Rappole (1992), Rappole & Warner (1980), Rappole *et al.* (1992), Ridgely & Gwynne (1989), Ridgway (1907), Sauer & Droege (1992), Sibley (2000), Skutch (1977), Slud (1964), Stickney (1923), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Walkinshaw (1967), Walkinshaw & Henry (1957), Warkentin *et al.* (1995), Wetmore (1972), Whitney & Kaufman (1986).

229. Acadian Flycatcher

Empidonax virescens

French: Moucherolle vert **German**: Buchenschnäppertyrann **Spanish**: Mosquero Verdoso

Taxonomy. *Platyrhynchos virescens* Vieillot, 1818, no locality = near Philadelphia, Pennsylvania, USA. Monotypic.
Distribution. Breeds mainly E North America from SE South Dakota and Great Lakes region E to S Ontario and C New England, S to C Texas, Gulf Coast states, and C Florida. Winters from Caribbean slope of Nicaragua S & E along both slopes to Colombia, NW Venezuela and W Ecuador.



Descriptive notes. 13-14·5 cm; 12·2-14 g. Large, long-billed and long-winged *Empidonax*. Adult has olive-green crown, pale lores, white or yellowish-white narrow eyering, pale olive-green malar region; ear-coverts, nape and upperparts olive-green; wings blackish, two whitish to yellowish-white wingbars, whitish margins of secondaries and tertials (forming panel on secondaries of closed wing); very long primary projection (longest of genus); tail dusky; throat and underparts pale greyish-white, pale olive wash across breast, darkest on side, may appear faintly streaked; pale yellow wash or tinge on belly and undertail-coverts; plumage varies with wear, upperparts brightest green and wing margins and underparts yellowish in spring (fresh plumage), drabber olive above and whiter below and on wing margins by late summer (worn plumage); moults on breeding grounds before migration, throat sometimes tinged yellow, buffy wingbars retained during winter; iris dark; bill large, flat, longest and broadest of genus, upper mandible black, lower mandible pale orange-yellow; legs grey, uniquely in genus. Sexes similar. Juvenile resembles adult, but wingbars bright buff, also buff fringes on body feathers creating scalloped appearance (lost in partial moult in Jul-Sept). Differs from most congeners in larger size, uniformly green upperparts, leg coloration; from *E. flaviventris*, *E. occidentalis* and *E. difficilis* mainly in whiter underparts, wing morphology, mouth coloration. Voice. Common call, by both sexes throughout year, a sharp "pwit", "pweet" or "peet"; "whip-pee-wheer" call also heard in SC Indiana. Song, mostly by male during breeding season (occasionally by female when stressed), often from dead branch 2-20 m (usually 3-6 m) up, often over stream, edge of light gap, or near nest, distinctive and explosive "péét-sah" or "téé-chup". Dawn song a rapidly delivered series of "tee-chup" mixed with "seet", "spake" or similar metallic notes, begins at least 45 minutes before and continues to or past sunrise; sometimes unbroken for long or entire period. Evening song, from perch 20-25 m up and in flight, a series of "wseet" or "pseet" notes followed by "wheel chur", "queer queep" and other notes. Also slow trill by male while fluttering between perches ("Flutter call"), reminiscent of wing noise produced by Mourning Dove (*Zenaida macroura*); variety of additional soft calls by both sexes, including e.g. "pee-tul" by food-carrying male, "p-link" or "p-loink" during greetings. Bill-snapping by both sexes during aggressive encounters and in courtship.
Habitat. Breeds in mature deciduous and coniferous forests, often near water in river bottoms, ravines or near streams. Associated with bald cypress (*Taxodium distichum*) in S USA; tamarack (*Larix laricina*) swamps and mixed forest of deciduous trees and hemlock (*Tsuga canadensis*) in N portion of range (e.g. Wisconsin). Inhabits deciduous forests of beech (*Fagus*), maple (*Acer*), oak (*Quercus*), hickory (*Carya*); also black ash (*Fraxinus nigra*) swamps in Canada (S Ontario), and rhododendron-bordered streams in Tennessee and North Carolina. During migration uses wider variety of open and forest habitats, including young second growth, secondary and primary rainforest in Costa Rica; montane forest and second-growth pine-oak woodland in Mexico (Chiapas), and dry forest, forest borders and urban areas in Cuba and Bahamas. Winters in lowland forest or shady plantations (e.g. cacao), often in understorey, thickets and treefall gaps of primary or secondary forests. Generally sea-level to 1000 m; breeds mainly below 1000 m; occasionally as high as 2850 m (in Bogotá savanna, in Colombia) during migration; winters at 600-1200 m in Venezuela.
Food and Feeding. Arthropods; fruit also recorded. Diet when breeding includes beetles (Coleoptera), hymenopterans, homopteran bugs (aphids, hoppers, cicadas), moths (Lepidoptera), damselflies and dragonflies (Odonata), deerflies and horseflies (Tabanidae), mosquitoes (Culicidae), craneflies (Tipulidae), spiders (Araneae), harvestmen (Opiliones), also many types of larvae; diet similar on non-breeding grounds in Panama, but also includes cockroaches (Blattidae), true bugs (Hemiptera), termites (Isoptera), sowbugs (Isopoda), and melastome fruits (Melastomataceae). Generally does not follow mixed-species flocks, although commonly recorded following army-ant swarms in Panama. Perches upright, jerks tail up (perhaps not so much as do congeners), sometimes with wings slightly drooped; sits quietly, searching for prey in understorey, near ground, or within canopy. Most foraging activity 2-12 m up, sometimes as high as 20 m; males may forage higher than females. Captures prey by sallying out from perch to hawk, strike or hover-glean insects from undersides of leaves, mid-air, bark or occasionally from ground, often returning to same perch.
Breeding. Mid-May to early Aug; some pairs double-brooded, especially in extreme S of range. Nest built by female, average inside diameter 4·82 cm, depth 2·71 cm, outside width 8·05 cm, depth

On following pages: 230. Willow Flycatcher (*Empidonax traillii*); 231. Alder Flycatcher (*Empidonax alnorum*); 232. White-throated Flycatcher (*Empidonax albigularis*); 233. Least Flycatcher (*Empidonax minimus*); 234. Hammond's Flycatcher (*Empidonax hammondii*); 235. Grey Flycatcher (*Empidonax wrightii*); 236. Dusky Flycatcher (*Empidonax oberholseri*); 237. Pine Flycatcher (*Empidonax affinis*); 238. Pacific-slope Flycatcher (*Empidonax difficilis*); 239. Cordilleran Flycatcher (*Empidonax occidentalis*); 240. Yellowish Flycatcher (*Empidonax flavescens*); 241. Buff-breasted Flycatcher (*Empidonax fulvifrons*); 242. Black-capped Flycatcher (*Empidonax atriceps*).

4-41 cm, appears loose and unkempt, consists of fine strips of bark, grape (*Vitis*) tendrils, fine twigs, grass and herbs, bound together by spider or cankerworm (*Paleacrita vernata*) silk, streamers of oak and hickory catkins hanging below; primary building material hemlock twigs in Michigan, Spanish moss (*Tillandsia usneoides*) in much of S USA; placed 3-9 m up in fork of horizontal branch of small tree or shrub, often with leaf cover above and near water in ravine, sinkhole, forested swamp or near stream, tree species used include e.g. witch hazel (*Hamamelis virginiana*), various oaks (*Quercus alba*, *Q. nuttalli*, *Q. lyrata*), beech, hemlock, sugar maple, flowering dogwood, basswood (*Tilia americana*), elm (*Ulmus*), sugarberry (*Celtis laevigata*), possum haw (*Ilex deciduas*); nest occasionally reused in successive years. Clutch 1-4 eggs, most commonly 3; incubation period 13-15 days; fledging period 12-18 days. In Michigan 64% of nests fledge more than one young, elsewhere success lower; nests parasitized by Brown-headed Cowbird (*Molothrus ater*). Breeds after first year. Oldest reported individual 10 years 11 months.

Movements. Long-distance migrant, wintering in Central America and N South America. Leaves breeding grounds late Aug-Sept in N part of range, lingering to Oct in S; transient Aug to mid-Oct in Mexico, Sept to late Nov in Costa Rica, and rare Sept-Oct in Cuba and Bahamas; migrates S through breeding range, most following coast of Gulf of Mexico and Caribbean, as well as interior S of Isthmus of Tehuantepec (S Mexico) to Honduras; in addition, some migrate over Bahamas and Cuba to Yucatán Peninsula, and possibly from latter region over Caribbean to coasts of Venezuela and Colombia. Arrives on wintering grounds in Panama by Sept. Departure by mid-Apr in Panama, early Mar to mid-May in Costa Rica; transient in Mexico mid-Mar to May; arrival on breeding grounds first half of May. Vagrants reported in W North America and Canadian Maritime Provinces.

Status and Conservation. Not globally threatened. Uncommon to fairly common. Overall population estimated at 4,700,000 individuals. Population relatively stable; US breeding-bird survey data show annual increase of 1·5% between 1966 and 1978, but annual decrease of 1·3% between 1978 and 1987. This species is often highly ranked for management and monitoring, because it appears sensitive to habitat fragmentation (in small fragments suffers high rates of nest predation and parasitism by cowbirds), and because of habitat loss and degradation on wintering grounds.

Bibliography. Anon. (1998a), Arendt (1992), Askins *et al.* (1990), Bennett (1980), Bent (1942), Blake & Loiselle (1992), Brauning (1992), Briskie (1994), Bull (1964), Chapa (1998), Clap *et al.* (1983), Cory & Hellmayr (1927), DeGraaf & Rappole (1995), Fjeldså & Krabbe (1990), Finch (1991), Fitzpatrick (1978, 1980a), Freemark & Collins (1992), Garrido & Kirkconnell (2000), Hespenheide (1980), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Johnsgard (1979), Johnson (1963a), Kaufman (1996), Kellner & Ritchison (1988), Meyer de Schauensee & Phelps (1978), Miller (1963), Mumford (1964), Mumford & Keller (1984), Newman (1958), Oberholser (1974), Olendorf & Robinson (2000), Orejuela *et al.* (1980), Paynter (1995), Peck & James (1987, 1997), Peterjohn *et al.* (1995), Powell *et al.* (1992), Price *et al.* (1995), Pyle (1997b), Raffaele *et al.* (1998), Rappole *et al.* (1993), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), Robinson, Thompson *et al.* (1995), Salaman (1994), Saunders (1909), Schorger (1927), Slud (1964), Sprunt & Chamberlain (1970), Stiles & Skutch (1989), Stoddard (1922), Stupka (1963),Udvardy (1963), Vidal-Rodríguez (1992), Wetmore (1972), Whitehead & Taylor (2002), Wiedenfeld *et al.* (1992), Wilson & Cooper (1998).

230. Willow Flycatcher

Empidonax traillii

French: Moucherolle des saules **German**: Weidenschnäppertyrann **Spanish**: Mosquero Saucero
Other common names: Traill's Flycatcher

Taxonomy. *Muscicapa traillii* Audubon, 1828, Arkansas River, USA.

Formerly considered conspecific with *E. alnorum*. Geographical variation in plumage, wing morphology and vocalizations probably clinal, becoming browner overall in W and paler in more arid environments, and racial boundaries not well defined; sometimes treated as monotypic. Described race *campestris* (from North Dakota, in N USA) synonymized with nominate. Four subspecies currently recognized.

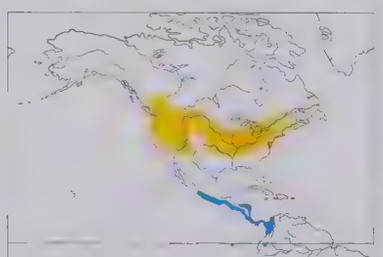
Subspecies and Distribution.

E. t. adastus Oberholser, 1932 - breeds SW Canada (S British Columbia) S in USA to E California (E of Sierra Nevada) and in Great Basin and Rockies; winters probably mainly W Mexico S to Panama.

E. t. traillii (Audubon, 1828) - breeds S parts of Canada (Alberta, Saskatchewan, Ontario, Quebec) and NC & NE USA; winters SW Mexico S to Panama and possibly extreme NW Colombia, also rarely to NE Ecuador.

E. t. brewsteri Oberholser, 1918 - breeds extreme SW Canada (SW British Columbia) S, W of Cascades, to SW California (W of Sierra Nevada); winters probably mainly W Mexico S to Panama.

E. t. extimus A. R. Phillips, 1948 - breeds SW USA; presumably winters W Mexico.



Descriptive notes. 13·3-17 cm; 11·3-16·4 g. Nominate race has indistinct narrow pale loral area, whitish eyering; rest of head drab olive, slightly darker than upperparts; wings blackish, two whitish to pale yellow wingbars, whitish to pale yellow margins of secondaries and tertials (forming panel on secondaries of closed wing); tail dusky; throat and underparts pale greyish-white, contrasting dull brownish-olive wash across breast, darkest on side, pale yellow wash or tinge on belly and undertail-coverts; plumage varies with wear, in spring (fresh plumage) brightest green above, wingbars may be tipped buff, also wingbars, eyering and breastband most prominent, by late summer (worn) drabber and brownish-grey above, whiter below, wingbars and wing margins narrower and whiter; iris dark; bill moderately long, upper mandible black, lower mandible pale orange-yellow; legs blackish. Distinguished in field from extremely similar *E. alnorum* mainly by voice, also (with difficulty) by less greenish upperparts, less contrasting wingbars, slightly shorter tail and longer bill. Sexes similar. Immature is browner above, yellower below, broader yellowish-buff wingbars. Races vary mainly in plumage tone, browner in W: *brewsteri* is darkest, *adastus* intermediate, *extimus* palest. Voice. Common call a mellow upslurred "whuit", "whit" or "whik", by both sexes at all seasons. Song, mainly by male from highest available perch, rarely by female, a distinctive nasal and buzzy "fitz-bew", sometimes followed by "creet" note, also (male only) similar "fizz-bew"; "fitz-bew" song of *extimus* distinct from other races, described as having slow drawl on "bew" part. Dawn song in Mexico described as "spt'chew". Flight song consists of a rapid series of "wheet" notes, followed by 8-12 "creet" and "fitzbew". Also gives soft upslurred and then downslurred "whup" call, also "writ-tu", "wee-oo" or "zwee-oo" (similar to "whup" call with buzz added at end), these two sometimes combined as "writ-tu whup". Raspy "cree" begging call by older chicks. Bill-snapping during aggressive encounters.

Habitat. Breeds in variety of moist shrubby habitats, often near water: include wet to dry upland and lowland habitats with willow (*Salix*) and many other tree species in E of range, riparian vegetation in SW USA; beaver (*Castor*) meadows in W, as well as drier upland habitats of Palouse Prairie (SE Washington) of hawthorn (*Crataegus*), chokecherry (*Prunus*) or rose (*Rosa*) and dry ninebark (*Physocarpus*) thickets. Uses similar habitats during migration, especially willows in W USA. Winters in variety of habitats, including shrubby forest borders, open woodland, clearings, pastures and arid scrub, often near water; early-successional growth on river islands in Amazonia. Sea-level to 2500 m; on migration mostly below 1000 m, rarely above 3500 m (presumably to cross Andes).

Food and Feeding. Arthropods; occasionally fruit. Recorded items include bees and wasps (Hymenoptera, including Ichneumonidae), beetles (Coleoptera, including Coccinellidae), flies (Diptera, including Tabanidae), butterflies and moths (Lepidoptera), true bugs (Hemiptera), dragonflies and damselflies (Odonata); nestlings fed mainly with dipterans and hemipterans, also arachnids, orthopterans, isopods and molluscs recorded. Fruit consumption recorded in Sept, including blackberries and raspberries (*Rubus*), dogwood (*Cornus*); fruit also recorded in faeces in Costa Rica. Forages by searching for prey from low perch; frequently flicks tail downwards. Prey captured from the air or foliage, in aerial hawking and sally-glean manoeuvres; occasionally taken from ground.

Breeding. Late May to Jun. Nest-site selected by female; nest a woven cup of stems, bark shreds, dry grass, plant fibres and pine needles, lined with feathers, hair and rootlets, outside decorated with lichen, cocoons, shredded grass and cottony thistle (*Crisium*) fibres, sometimes streamers hanging from base (less commonly than nest of *E. alnorum*), average outside diameter 8·2 cm, height 6·7 cm, inside cup diameter 5·2 cm, depth 3·9 cm; placed 0·6-20 m (mostly 0·9-1·5 m) above ground in crotch of shrub or small tree, frequently willow (*Salix*), less often tamarisk (*Tamarix chinensis*), box elder (*Acer negundo*), on Pacific coast live oak (*Quercus agrifolia*), American elder (*Sambucus canadensis*), red-osier and grey dogwood (*Cornus stolonifera*, *C. racemosa*), hawthorn (*Crataegus*), buttonbush (*Cephalanthus*), alder (*Alnus*), pear (*Pyrus*), privet (*Ligustrum*), honeysuckle (*Lonicera*) or bracken fern (*Pteridium aquilinium*). Clutch 3-4 eggs; incubation period 13-14 days; fledging period 13-15 days. Success variable, 68·6% of nests fledged more than one young in Wisconsin USA, only 28% in British Columbia (Canada); average lifetime reproductive success for female 3·59 young; nests parasitized by Brown-headed Cowbird (*Molothrus ater*). Sexually mature in first breeding season after hatch year. Longevity record at least 11 years, but mean lifespan for male closer to 1 year.

Movements. Long-distance migrant; winters in S Mexico, Central America and N South America, rare S to NE Ecuador. Migrates at night. Departs breeding grounds mid-Aug to Sept; E populations swing W before heading S, avoiding SE USA in a circum-Gulf or trans-Gulf of Mexico route to Central and South America; rare in Cuba and Jamaica during autumn migration; C & W populations pass through Mexico Aug-Oct, and more abundant on Pacific slope than interior or Atlantic slope. Adults migrate earlier than juveniles, which may be stimulated to depart breeding grounds by declining insect resources. On return migration passes through Mexico Apr to early Jun; trans-Gulf route unlikely for E populations in spring. Arrives on breeding grounds late, May to early Jun.

Status and Conservation. Not globally threatened. Overall population estimated at 3,300,000 individuals; conservation plan aims at increasing total numbers by at least 50%. Fairly common to common. US survey data show annual decrease of 1·3% between 1966 and 1996, but significant increases in Maine, Maryland, New Jersey, New York, North Dakota and Pennsylvania. Nominate race has expanded its range in E USA and S Canada (Ontario) following forest removal, wetland drainage, and the overgrowing of pastures with shrubs and trees. SW race *extimus*, formerly common, declined dramatically over the last century because of destruction of its riparian habitats through water-flow regulation, agriculture and urbanization, and consequent cowbird parasitism, all of which factors affect other races too; now rare, or even locally extinct (e.g. in Arizona, California and N Arkansas), and has apparently disappeared from former range in NW Mexico (Baja California, N Sonora); currently numbers no more than c. 1000 individuals, with largest population (243 pairs in 1999) along R Gila, in SW New Mexico, and others containing fewer than 40 individuals each. Critical habitat for this race now protected in Arizona, California and New Mexico. Pacific coast race *brewsteri* has also declined; once common, it is now rare and local, with only c. 200 pairs left in California. Loss and alteration of wooded habitats in wintering range in Central America and N Colombia may also have a negative effect.

Bibliography. Aldrich (1951, 1953), Anon. (1998a), Arendt (1992), Baicich & Harrison (1997), Bent (1942), Berger (1957), Berger & Parmalee (1952), Browning (1993), Busch *et al.* (2000), Campbell, L.W. (1936), Campbell, R.W. *et al.* (1997), Cory & Hellmayr (1927), Crawford (1976), Cyr & Larivée (1995), DeGraaf & Rappole (1995), Dickey & van Rossem (1938), Dunning (1984), Edwards (1972), Fitzpatrick (1980a), Godfrey (1986), Gorski (1969a, 1969b, 1970), Hejl *et al.* (1995), Hilty (2003), Hoffman (1927), Holcomb (1972), Howell & Webb (1995a), Hubbard (1987), Hussell (1991b), Jewett *et al.* (1953), Johnsgard (1979), Johnson (1963a), Johnson *et al.* (1999), Kaufman (1996), King (1955), Lowther (1999), McCabe (1951), Paxton *et al.* (2002), Paynter (1995), Peck & James (1987, 1997), Phillips (1948), Phillips *et al.* (1964), Price *et al.* (1995), Pyle (1997b, 1997c), Raffaele *et al.* (1998), Remsen (1978), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson, Rothstein *et al.* (1995), Sauer *et al.* (1997), Sedgwick (1998a, 2000, 2001), Serena (1982), Small (1994), Sogge (1997), Sogge *et al.* (1997), Stein (1958, 1963), Stevenson (1957), Stiles & Skutch (1989), Stoleson & Finch (1998), Udvardy (1963), Unitt (1987), Valentine *et al.* (1988), Walkinshaw (1966), Wetmore (1972), Whitney & Kaufman (1986), Winker (1994).

231. Alder Flycatcher

Empidonax alnorum

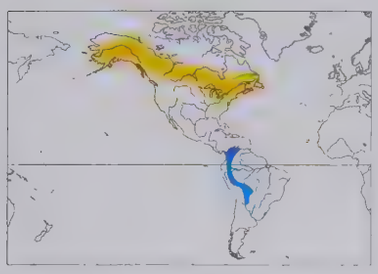
French: Moucherolle des aulnes **German**: Erlenschnäppertyrann **Spanish**: Mosquero Alisero

Taxonomy. *Empidonax traillii alnorum* Brewster, 1895, Upton, Maine, USA.

Formerly considered conspecific with *E. traillii*. Birds in NW of range (Alaska, Yukon Territory and NW Mackenzie) may average larger, with paler head and slightly paler back; named as race *alascensis*, but further studies required. Monotypic.

Distribution. Breeds from W Alaska S to SC British Columbia and E to Canadian Maritime Provinces, and from Great Lakes E in USA to New England and S to N Indiana, Ohio and, in Appalachians, to North Carolina. Winters mainly W South America, from C Colombia and E Ecuador S to E Peru and N & E Bolivia; probably also in E Panama and N Argentina.

Descriptive notes. 13-17 cm; 12-14 g. Has narrow indistinct pale lores and whitish eyering (rarely, lacking); rest of head drab olive, crown slightly darker than upperparts; wings blackish, two whitish to pale yellow wingbars, whitish to pale yellow margins of secondaries and tertials (forming panel on secondaries of closed wing); tail dusky; throat and underparts white, contrasting dull brownish-olive wash across breast, darkest on side, pale yellow wash or tinge on belly and undertail-coverts (especially in spring); plumage varies with wear, wingbars broader and sometimes tinged pale yellow, upperparts brightest green, wingbars, eyering and breastband most prominent in spring (fresh plumage), drabber olive above, whiter below and on wing margins, and wingbars and wing margins narrower in late summer (worn); iris dark; bill moderately long, upper mandible black, lower mandible pale orange-yellow; legs blackish. Distinguished in field with difficulty from *E. traillii* except by voice, but generally greener crown and upperparts, more pointed wings with



brighter and more contrasting wingbars, slightly shorter bill and longer tail. Sexes similar. Immature is browner above, broader yellowish-buff wingbars, sometimes buff wing-linings and thighs. Voice. Common call a short "pip", "pit", "tip", "bic", "peep" or "whit", perhaps more similar to call of *E. hammondii* than to that of *E. traillii*. Song a distinct buzzy "fee-béé-o", the "bee" accented, the "bee-o" slurred and dropping in pitch on "o". Also, a "wee-oo" call, similar to "pip" call but with buzzy ending and superficially resembling "fitz-bew" of *E. traillii*. Also "churr" and "kritter" calls recorded, perhaps constructed of series of "pip" calls or parts of other calls. Bill-snapping during aggressive encounters.

Habitat. Breeds in wet thickets and shrubby wetlands near forest. These habitats include alder-buckthorn (*Alnus-Rhamnus*) thickets in Michigan; successional stands 3-8 years old of maple (*Acer saccharum*, *A. ruber*) and birch (*Betula papyrifera*, *B. alleghaniensis*) in Nova Scotia; damp meadows open or overgrown with willow (*Salix*), alder, cedar (*Juniperus*), tamarack (*Larix laricina*), spruce (*Picea*), poplar (*Populus*), birch, hawthorn (*Crataegus*), elm (*Ulmus*), hazel (*Corylus*) and maple in Ontario; young deciduous trees and shrubs near water, including willow, alder, black cottonwood (*Populus trichocarpa*), rose (*Rosa*), honeysuckle (*Lonicera utahensis*), dogwood (*Cornus*), currant (*Ribes*), raspberry (*Rubus*) and aspen (*Populus tremuloides*) stands in British Columbia, with second growth 4-8 years old preferred; dogwood (*Cornus racemosa*), chokecherry (*Prunus virginiana*), red raspberry (*Rubus idaeus*), arrow wood (*Viburnum dentalum*), speckled alder (*Alnus incana*), apple (*Pyrus malus*) and other trees in New York. Uses variety of humid to semi-arid open habitats during migration, including scrubby fields, woodland, forest borders. Winters in lower strata of second growth, thickets and forest borders near water, also in early-successional vegetation on sandbars and in dense vegetation along oxbow lakes; near Iquitos, in Peru, recorded near standing water between shrubby vegetation of *Vermonia*, *Veruena* and *Clibadium* and open *Andropogon*, *Xyxis* and *Cyperus* grass with scattered palms. Breeds from sea-level to 1300 m; on migration to 2500 m in Mexico, rarely higher in Bolivia (Cochabamba) and Colombia (on Bogotá savanna); to 1100 in South America in winter.

Food and Feeding. Arthropods; also fruit in winter. Insects include hymenopterans, beetles (Coleoptera), flies (Diptera), lepidopterans, orthopterans. Searches for prey from perch 2·5-4·4 m up in trees and shrubs; frequently flicks or wags tail downwards. Prey captured from the air or foliage, by aerial hawking and sally-gleaning, relative proportions of foraging manoeuvres varying between different habitats; foraging flights last 4-6 seconds, after perching for 3-4 minutes.

Breeding. Mid-Jun to early Aug; short breeding season, 70-90 days. Nest built by female, a cup loosely constructed from various plant materials, many coarse streamers hanging beneath, lined with wiry grass and conifer needles; average outside diameter 8·2 cm, depth 6·25 cm, inside diameter 5·3 cm, depth 3·8 cm; placed on average 62·5 cm up (lower than *E. traillii*) in deciduous shrub or tree or in conifer, rarely in grass, most frequent nesting trees include willow, dogwood, beaked hazelnut (*Corylus cornuta*) and hawthorn. Clutch 3-4 eggs; incubation period 11-15 days, usually 14-15 days; fledging period probably 14 days. Nest parasitism by Brown-headed Cowbird (*Molothrus ater*) recorded. Longevity record 3 years 2 months.

Movements. Long-distance migrant, wintering almost exclusively in South America; more S winter distribution than *E. traillii*. Migrates at night. Departs breeding grounds late Aug, juveniles lingering longer than adults; migrates S through E & C USA, Atlantic slope of Mexico S to Veracruz (but not Yucatán Peninsula), interior and both slopes S from Chiapas, passing through Mexico and N Central America Aug-Sept, through Costa Rica late Aug to early Nov; rare in Florida, suggest that autumn migration may occur slightly E of spring migration. Probably leaves wintering grounds between Mar and early May; passing through Panama Apr to early May, Costa Rica and El Salvador up to late May, Central America and Mexico up to early Jun, and C & E USA early May to mid-Jun (peak in late May). Arrives on breeding grounds late and departs early; migration periods similar to those of *E. traillii*, perhaps on average 1 week later in spring and earlier in autumn; information on timing and routes hampered by problems associated with distinguishing the two species during migration. Vagrant recorded in Bermuda.

Status and Conservation. Not globally threatened. Common; total population estimated at 49,000,000 individuals. Densities 0·02-6 pairs/ha at various sites. Historical range contractions have been linked with expansion of *E. traillii*, especially in E USA, although validity of this link is questioned. Range expansion to S reported in interior mountains of SW Canada (SE British Columbia). May benefit during recovery from forest disturbance, as successional vegetation replaces cleared forest.

Bibliography. Andrews & Righter (1992), Anon. (1998a), Armstrong (1983), Baicich & Harrison (1997), Barlow & McGillivray (1983), Beal (1912), Bent (1942), Campbell *et al.* (1997), Clapp *et al.* (1983), Crawford (1976), Cyr & Larivée (1995), DeGraaf & Rappole (1995), Erskine (1992), Fitzpatrick (1980a), Fjeldså & Krabbe (1990), Foster (1998), Gómez & Aguilar (1998), Gorski (1969a), Howell & Webb (1995a), Hussell (1991a, 1991b), Kaufman (1990, 1996), Kroodsma (1984), Lehman (1985), Lowther (1999), Mousley (1931), Paynter (1995), Peck & James (1987, 1997), Price *et al.* (1995), Pyle (1997b), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robertson & Woolfenden (1992), Robinson *et al.* (1988), Sedgwick (2000), Stein (1958, 1963), Stiles & Skutch (1989), Thompson & Ely (1989), Wetmore (1972), Whitney & Kaufman (1986), Winker (1994).

232. White-throated Flycatcher

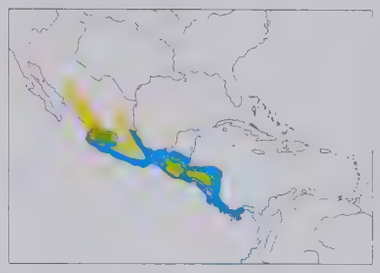
Empidonax albigularis

French: Moucherolle à gorge blanche **Spanish**: Mosquero Gorgiblanco
German: Fahlkehl-Schnäppertyrann

Taxonomy. *Empidonax albigularis* P. L. Sclater and Salvin, 1859, Dueñas, Guatemala.
Three subspecies recognized.

Subspecies and Distribution.
E. a. timidus Nelson, 1900 - Pacific slope of W Mexico (extreme SE Sonora and SW Chihuahua S to Isthmus of Tehuantepec) and locally in interior (Guerrero and Oaxaca).
E. a. albigularis P. L. Sclater & Salvin, 1859 - Caribbean slope of E Mexico (S from SW Tamaulipas) S to Guatemala, El Salvador and Honduras; probably winters S to S Central America.
E. a. australis W. deW. Miller & Griscom, 1925 - Nicaragua S to Panama.

Descriptive notes. 12-14 cm; 12 g. Small brown *Empidonax* with short, rounded wings. Adult has pale lores and indistinct narrow buffy eyering; rest of head and back brown to grey-brown or brownish-olive, rump and uppertail-coverts more tawny-brown; wings and tail dusky, two dull brown to pale buff wingbars, pale cinnamon to pale yellow margins of secondaries and tertials



(forming panel on secondaries of closed wing); throat white, white extending under auriculars; breast washed grey-brown, belly and undertail-coverts pale yellow, buffier on flanks; in worn plumage, greyer above, paler below, wingbars and margins of remiges narrower and whitish; iris dark; bill relatively long and broad, upper mandible black, lower mandible pinkish-orange; mouth-lining orange; legs blackish. Differs from similar *E. traillii* and *E. alnorum* in warmer brown upperparts, more cinnamon-buff wingbars, ochre-washed flanks. Sexes alike. Juvenile is duller, more sooty brown above, broader and brighter cinnamon wingbars. Races differ minimally in plumage tone. Voice. Burry and nasal call notes with rising inflection, as "neeark" or "rreeah" (Mexico) or "wrick", "rrrip" and "pit-a-rip" (Costa Rica). Song described as a louder "bee-uh" (Mexico) and "wheet", "whirrt" or doubled "whit-whirrt" (Costa Rica).

Habitat. Breeds in damp meadows and other open to semi-open shrubby second-growth habitats, often near water. Winters in marshes with tall reeds and scrubby margins. At 1200-3000; down to sea-level during winter.

Food and Feeding. Mainly insects, including beetles (Coleoptera), small wasps (Hymenoptera), larvae and nymphs of mantids and grasshoppers (Orthoptera), damselflies (Zygoptera), homopteran bugs, and flies (Diptera); also small amounts of fruit. Sits upright on low perch 1-2 m above ground; sallies out to capture prey from the air or vegetation; flicks wings and tail upon landing.

Breeding. Apr-Sept in Mexico and Apr-Jun/Jul in Costa Rica. Nest a cup made of dry grass and other plant fibres, placed 1-2 m up in shrub or small tree. Clutch 2-3 eggs, usually 2 in Costa Rica; no other information.

Movements. Little known. Winter visitor to W Mexico (Sinaloa) Aug to early May; Mexican migrants thought to reach Costa Rica.

Status and Conservation. Not globally threatened. Uncommon to common, but local. Fairly common to common non-breeding visitor in Sinaloa, less common in interior and on Atlantic slope of Mexico and S Yucatán Peninsula. Occurs in Lamanai Archaeological Reserve, in Belize, and Río Negro Jaguar Reserve and Rancho Naturalista, in Costa Rica.

Bibliography. Anon. (1998a), Binford (1989), Blake, E.R. (1953, 1958), Cory & Hellmayr (1927), Dearborn (1907), DeGraaf & Rappole (1995), Howell & Webb (1995a), Fitzpatrick (1980a), Land (1970), Lee Jones (2004), Lowery & Dalquest (1951), Monroe (1968), Ridgely & Gwynne (1989), Ridgway (1907), Stiles & Skutch (1989), Stotz *et al.* (1996), Thurber *et al.* (1987), Wetmore (1943, 1972), Winker *et al.* (1999).

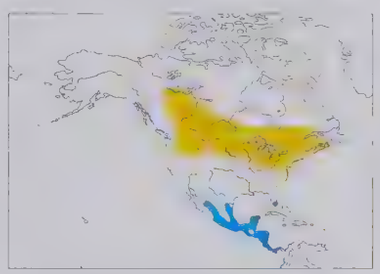
233. Least Flycatcher

Empidonax minimus

French: Moucherolle tchébec **German**: Zwergschnäppertyrann **Spanish**: Mosquero Mínimo

Taxonomy. *Tyrannula minima* W. M. Baird and S. F. Baird, 1843, near Carlisle, Pennsylvania, USA.
Probably diverged from other members of genus c. 1·8 million years ago, in late Pliocene or early Pleistocene. Monotypic.

Distribution. C Canada (S Yukon and NW interior E to S Quebec and S Maritime Provinces) S in USA to NE Colorado, N Great Plains, New England and (in Appalachians) NW Georgia. Winters both slopes of Mexico (S from Sonora and Tamaulipas), rarely S USA, S through Central America, at least casually to Costa Rica and C Panama.



Descriptive notes. 12·5-14 cm; 8-13 g. Small, compact *Empidonax* with short bill, short rounded wings and short, narrow tail. Has whitish supraloral stripe and bold white eyering; crown rounded, brownish to greyish-olive; ear-coverts, malar region, nape and upperparts greyish-olive; wings dusky, two broad white to pale yellow wingbars, white to pale yellow margins of tertials and secondaries (forming panel on secondaries of closed wing); tail slightly notched, dusky; throat whitish, underparts whitish, greyish wash across breast and sides, belly and undertail-coverts tinged pale yellow; plumage varies with wear, brightest above and with broadest wingbars and margins on remiges in spring (fresh plumage), drabber overall with narrower and whiter wingbars and remex margins in Sept-Dec (worn); iris dark; bill triangular, upper mandible black, lower mandible dusky with yellow-orange base; legs blackish. Distinguished from congeners mainly by small size, short primary extension, colour; from similar *E. hammondii* also by wider bill with paler lower mandible, bolder white primary and secondary edgings. Sexes similar, female distinguished in hand by shorter length of flattened wing. Juvenile resembles fresh-plumaged adult, but browner above, whiter below, wingbars tinged buff. Voice. Most frequent call a short soft "whit". Most distinctive vocalization "chebec", by both sexes. Dawn singing starts 45-71 minutes before sunrise, lasts 30-70 minutes; flight song given 20-60 minutes after sunset, begins with sporadic "weep" notes while hopping in tree, then combined with "chebec" and other notes in flight, described as "chebec-tooral-ooral, chebec-tooral-ooral". Quiet "churr" or "thrr thrr" calls by both sexes during nest-building or sitting on nest; other twitter, chatter and trilled notes and guttural "speets" call reported when mates greet each other or young. "Wee-weep" notes during aggressive encounters and nest or territorial defence. Bill-snapping during aggressive encounters. Recent work suggests possible differences in song structure between sexes.

Habitat. Breeds in mature deciduous and mixed forests, secondary forest, forest clearings and borders, and occasionally shrubby fields; associated with closed canopy forest of sugar maple (*Acer saccharum*) in SE Canada (Quebec). Similar habitats used during migration. Winters in tropical forest near openings and edges, old and young second growth, dense thickets, brushland and pastures; sea-level to 1000 m on Pacific slope of Central America, to 1500 m on Caribbean slope.

Food and Feeding. Insects, occasionally fruit. Diet includes hymenopterans, beetles (Coleoptera), flies (Diptera), lepidopteran adults and larvae, orthopterans, arachnids, damselflies and dragonflies (Odonata), mayflies (Ephemeroptera); midges (Chironomidae) commonest item in stomachs of birds at Delta Marsh, in Manitoba (C Canada); fruits and seeds found in stomachs include those of *Rubus*, *Sambucus canadensis*, *Phleum pratensis* and *Chaetochloa*. Forages by searching from

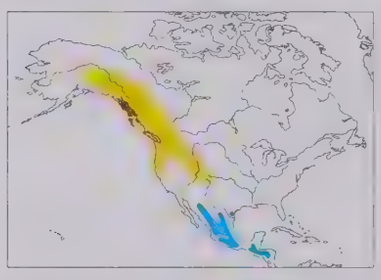
low perch; perches erect, often with tail held slightly below plane of body; flicks tail. Captures prey from air or foliage, using aerial sallies and hover-glean manoeuvres.
Breeding. Late May to early Aug; short breeding season estimated at no more than 64 days. Nest cup neat and compact, with thick rim, woven with bark strips, downy plant fibres, grass, twigs, rootlets, moss, pine (*Pinus*) needles, leaves and other materials, lined with fine grass, feathers, animal hair, thistle or willow (*Salix*) down, and plant stems; in various studies average outside diameter 6·5-8 cm, outside depth 3·6-10 cm, inside diameter 4-5 cm, depth 2·5-3·5 cm; placed 0·6-15 m up in crotch or fork (with 3-4 branches) of small tree, e.g. birch (*Betula*) maple (*Acer*), poplar (*Populus*), pine, American beech (*Fagus*), willow, green ash (*Fraxinus pennsylvanica*), elderberry (*Sambucus*), cherry (*Prunus*) or oak (*Quercus*), nest tree selected in proportion to abundance at some sites. Clutch 4 eggs; incubation period 13-15 days; fledging period 12-17 days. Success variable, 38% of nests fledge more than one young in Manitoba (Delta Marsh), 51·9% in Michigan, 53% in Quebec, perhaps higher elsewhere; nests infrequently parasitized by Brown-headed Cowbird (*Molothrus ater*). Sexually mature in first breeding season after hatching. Longevity record 5 years 11 months after ringing.
Movements. Long-distance migrant, wintering in Mexico and Central America. Migrates at night. Departs breeding areas relatively early, in Jul to mid-Aug, adults leave earlier than juveniles (perhaps because of strong competition for winter territories); migrates on average 15 days ahead of *E. alnorum*, *E. traillii* and *E. flaviventris*; moves through SC USA from Mississippi Valley and N Gulf states W to Rocky Mts, passing through most of Mexico (both slopes, avoiding NW) mid-Jul to Oct, arriving in Guatemala by mid-Aug and El Salvador by early Sept; autumn migration estimated to take 25 days, and an individual recovered in Chiapas (Mexico) 32 days after ringing at Long Point (S Canada) suggests minimum average daily flight of 98-116 km (depending on migration route). Departs wintering grounds Apr-May, passing through S USA late Mar to mid-Apr, arriving in S Canada first half of May and N Canada by late May; males arrive on breeding grounds c. 6 days earlier than females. Casual N of breeding range.
Status and Conservation. Not globally threatened. Common; overall population estimated at 14,000,000 individuals. Breeding density varies, 1·4 pairs/ha in New Hampshire (USA) to greater than 4·4 pairs/ha in Manitoba (Canada); perhaps higher densities achieved on wintering grounds. Breeding population for Canadian Maritime Provinces estimated at 77,000 individuals. Survey data for 1966-1991 indicate no significant population trends on a continental scale, although regional declines noted in E North America and increases in C & W North America. E declines may be due to progressing succession and maturity of forests, but also correlated with forest die-back due to acid rain in Quebec. N populations may also fluctuate with spruce-budworm outbreaks, by feeding on the abundant adult moths. Loss and alteration of wooded habitats in wintering range may also have a negative effect (e.g. Mexican high-elevation forests have been extensively logged and overgrazed).
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Beal (1912), Bent (1942), Binford (1989), Breckenridge (1956), Briskie (1994), Briskie & Sealy (1989a, 1989b), Briskie *et al.* (1990), Campbell *et al.* (1997), Cory & Hellmayr (1927), Cyr & Larivée (1995), Darveau, DesGranges & Gauthier (1992), Darveau, Gauthier *et al.* (1993), Davis (1959), DeGraaf & Rappole (1995), Delgado (1985), Della Sala & Rabe (1987), Ely (1970), Erskine (1992), Fitzpatrick (1980a), Greenberg (1992), Hespenheide (1971a), Holmes & Robinson (1981), Holmes & Sherry (1988), Holmes *et al.* (1986), Howell & Webb (1995a), Hussell (1981, 1984), Hussell *et al.* (1992), Johnsgard (1979), Johnson (1963a), Kasumovic *et al.* (2003), Kaufman (1996, 1997), de Kiriline (1948), MacKenzie *et al.* (1982), MacQueen (1950), Martin (1994), Monroe (1968), Nice & Collias (1961), Peck & James (1987, 1997), Perry & Andersen (2003), Peterjohn *et al.* (1995), Phillips & Lanyon (1970), Price *et al.* (1995), Pyle (1997b), Ramos (1988), Rappole & Warner (1980), Ridgely & Gwynne (1989), Ridgway (1907), Sealy & Biermann (1983), Sherry (1979), Sibley (2000), Slud (1964), Small (1994), Stiles & Skutch (1989), Tarof & Ratcliffe (2000), Thompson (1891), Udvardy (1963), Wagner (1998), Wetmore (1972), Wiedenfeld *et al.* (1992), Witham & Hunter (1992), Zink & Johnson (1984).

234. Hammond's Flycatcher

Empidonax hammondii

French: Moucherolle de Hammond **Spanish**: Mosquero de Hammond **German**: Tannenschnäppertyrann

Taxonomy. *Tyrannula hammondii* Xántus de Vesey, 1858, Fort Tejon, California, USA.
Monotypic.
Distribution. Breeds from C Alaska and W Canada (from S Yukon) S in W USA to EC California, EC Nevada, C Utah and the Four Corners Region E to NC New Mexico. Winters locally SW USA and S from Mexico (Pacific slope and interior highlands) to Guatemala, El Salvador, Honduras and probably NC Nicaragua.



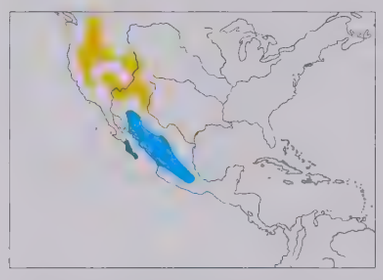
Descriptive notes. 12·5-14·5 cm; 7·7-12·1 g. Has white eyering, broadest at rear (forming slight teardrop shape); greyish crown, slight rounded crest; head side and nape grey, upperparts greyish-olive; wings dusky, two narrow white wingbars, indistinct narrow white margins of secondaries and tertials; long primary projection; tail short and narrow, tip notched, dusky, white outer webs of outer rectrices; throat pale grey, breast whitish, greyish-olive wash across chest, sides and flanks (creating vested appearance), lower belly and undertail-coverts whitish with pale yellow wash; plumage brighter when fresh (moults before migrating to wintering grounds), with dark olive breast and back contrasting grey head, brighter yellow below, wingbars and tertial margins tinged pale buffy yellow, becomes duller and paler with wear; iris dark; bill small, short and narrow, upper mandible black, lower mandible dark with yellowish-orange base; legs blackish. Best distinguished from similar *E. oberholseri* by voice, also habitat, and shorter and thinner bill, longer primary projection, more compact rounded body, more forked tail, slightly shorter tarsus. Sexes similar. Juvenile resembles adult, but broader and buffier wingbars, brighter olive back. Voice. Common call a distinct and sharp "pip", "peep" or "peek", reminiscent of that of Pygmy Nuthatch (*Sitta pygmaea*). Song consists of three elements, "tsi-pik", a high and then scratchy "swi-vrk" and lower "grr-vik"; distinguished from that of *E. oberholseri* by lower pitch, hoarser quality, lack of clear high notes, more strongly syllabled. Also a unique soft whistle, "k-lear", often followed by slightly buzzy "whee-zee", most often by male irregularly during breeding season; also "d-d-d-d-d-d-drrt" twittering trill, similar to trill of *E. oberholseri* but higher, by both sexes. Female gives "wheep" position note. Older nestling give raspy "du-wee" begging call. Bill-snapping during aggressive encounters.
Habitat. Breeds in cool mature coniferous and mixed forests, including Douglas Fir (*Pseudotsuga menziesii*), ponderosa and lodgepole pines (*Pinus ponderosa*, *P. contorta*), spruce (*Picea*), aspen (*Populus*), alder (*Alnus*) and dogwood (*Cornus*). Wider variety of habitats during migration, including deciduous and coniferous forest, pine-oak (*Pinus-Quercus*) woodlands, willow (*Salix*) thickets, chaparral, and scrub. Winter habitats similar to breeding ones, including fir, pine, oak and riparian forests in cool highlands of Mexico and Central America. Found at 2100-3000 m in Colorado (USA); 1000-2600 m in El Salvador. Usually found higher in tall coniferous forest; *E. oberholseri* lower in chaparral and small trees, and *E. wrightii* in sagebrush (*Artemisia*) and more arid habitats.
Food and Feeding. Insects, including adult and larval lepidopterans, coleopterans (of family Scarabaeidae), Diptera (of families Empididae, Rhagonidae, Syrphidae, Tipulidae), homopteran bugs (Cicadellidae), braconid wasps. Searches for prey while perched on small dead branches and twigs, from ground level to middle canopy 30 m up in shaded open areas; perches less upright than congeners, often flicks tail. Captures prey in flight, using sally and hover-glean manoeuvres directed to air, foliage, bark, branches or ground; prey sometimes beaten or crushed against perch to remove wings or otherwise to prepare for consumption. Forages more frequently on leaf surfaces at higher levels within canopy early in breeding season, switching to more aerial prey at lower levels later in season.
Breeding. Late May to Aug. Nest built by female, a compact cup made of fine plant fibres, fine grass, bark strips, rootlets, lichen and leaves, lined with feathers of other birds, bud scales, animal hair, fine grass, beard lichen (*Usnea*), cottony plant fibres, one in California constructed mostly of lichen, moss and bryophytes and bound with spiderweb; average outside diameter 8·5 cm, height 5·4 cm, inside diameter 5·7 cm, depth 2·5 cm; placed 3·5-15 m up, saddled on large horizontal tree limb where small branches emerge, less frequently in crotch of tree trunk, nest trees include various conifers, *Populus*, birch (*Betula*), maple (*Acer*). Clutch 3-4 eggs, 4 more frequent; incubation period 15 days; fledging period 16-18 days. Nest parasitism by Brown-headed Cowbird (*Molothrus ater*) occurs infrequently.
Movements. Migrant, wintering in Mexico and Central America. Migrates at night. Autumn migration protracted compared with close congeners; departs breeding grounds mid-Aug to Sept, lingers in S California to mid-Oct, passes through Arizona mid-Aug to early Nov, arrives in Guatemala mid-Oct; moves S along Sierra Nevada before crossing Pacific slope and SW deserts, using middle elevations in Arizona; travels through Mexico S along Sierra Madre, then spreads out over S & E Central Plateau (avoiding coastal plain of S Sonora and Sinaloa); passage earlier and lasts 5 weeks in interior, c. 7 weeks in coastal areas. Departs wintering grounds Mar-May, passing through S Arizona late Mar to late May and far W USA mid-Mar to early Jun; adult males arrive on breeding grounds first, followed by first-year males, then adult females and, last, first-year females. In general, migrates earlier in spring and later in autumn than *E. oberholseri*. Casual N of breeding range; vagrants recorded along Gulf Coast of USA and in E North America, usually in autumn.
Status and Conservation. Not globally threatened. Common; overall population estimated at 13,000,000 individuals. Densities 14-47 birds/km², varying within and between habitats. Survey data show trend of non-significant increase between 1966 and 1991, 1·3% annually (especially in Alberta, California and Colorado). This species' preferred habitat of old-growth forest greater than 10 ha in size, and 80-90 years of age, is threatened with reduction and fragmentation by logging. Loss and alteration of wooded habitats in wintering range may also have a negative effect (e.g. Mexican high-elevation forests have been extensively logged and overgrazed).
Bibliography. Andrews & Righter (1992), Anon. (1998a), Armstrong (1983), Baicich & Harrison (1997), Bailey & Niedrach (1965), Beaver & Baldwin (1975), Bent (1942), Bowles & Decker (1927), Campbell *et al.* (1997), Cory & Hellmayr (1927), Davis (1954), DeGraaf & Rappole (1995), Dickey & van Rossem (1938), Edwards (1972), Fitzpatrick (1980a), Godfrey (1986), Grinnell & Miller (1944), Hayward *et al.* (1976), Hejl *et al.* (1995), Howell & Webb (1995a), Hutto (1992), Johnson, N.K. (1963a, 1963b, 1965, 1970), Kaufman (1996), Larrison & Sonnenberg (1968), Mannan (1984), Monroe (1968), Peterjohn *et al.* (1995), Phillips *et al.* (1964), Price *et al.* (1995), Pyle (1997b), Ramos (1988), Ridgway (1907), Sakai (1987), Sedgwick (1975, 1994), Small (1994), Udvardy (1963).

235. Grey Flycatcher

Empidonax wrightii

French: Moucherolle gris **German**: Trockenbusch-Schnäppertyrann **Spanish**: Mosquero Gris
Other common names: Wright's Flycatcher

Taxonomy. *Empidonax wrightii* S. F. Baird, 1858, El Paso, Texas, USA.
Formerly considered conspecific with *E. oberholseri*. Despite many similarities with that species, is apparently more closely related to *E. hammondii* and *E. atriceps*. Monotypic.
Distribution. Breeds extreme SW Canada (S British Columbia) and Great Basin states of NW USA S to SC California and E to S Wyoming and C Colorado, locally to W Texas. Winters SW USA and Mexico (S to S Baja California and Oaxaca).



Descriptive notes. 14-15·5 cm; 12·5 g. Large pale grey *Empidonax*. Has narrow whitish supraloral stripes meeting over bill, narrow whitish eye-ring; crown dull pale grey, slight rounded crest; head side, nape and upperparts grey; wings blackish-grey, two narrow whitish wingbars, narrow pale grey margins of secondaries and tertials; short primary projection; tail long, narrow, slightly notched, grey, outer webs of outer rectrices white; throat whitish-grey, breast pale grey, sometimes slightly darker breastband, lower belly and undertail-coverts whiter with faint yellow wash; plumage varies with wear, has slight olive tinge above, broader yellowish-white wingbars and pale yellow wash on belly and undertail-coverts when fresh (most moult on wintering grounds), becomes whiter below, paler grey above and with wing markings and outer webs of outer rectrices whiter and narrower when worn; iris dark; bill long and narrow, upper mandible black, lower mandible pinkish-yellow with sharply defined black tip; legs blackish. Sexes alike. Juvenile is similar to adult, but brownish-grey above, tinged brownish-buff below, pale buff wingbars and margins of tertials. Distinguished from congeners mainly by long wings and bill, uniformly pale greyish upperparts, pale band above bill, bill pattern. Voice. Frequent call a dry "pit" or "whit". Song, by male only, consists of two elements, a "chuwip", "chi-bit" or "jr-vrip" and a higher "teeap", "whilp" or "tidoo", given in various combinations as e.g. "sprlat-sprlat", "chlup-clup", "chuh-lup-chu-lup", "sprlat-prit" or "sprlat-seep". Dawn song similar. Both sexes give rattle call, "pddrea" or "pddreap", during aggressive encounters, territorial disputes and chases, both also give "d-d-d-d-d" or "dit-dit-dit-dit-dit" solicitation call during greeting near nest or in display, male solicitation call from perch 1·5-6 m high; rattle and solicitation calls sometimes combined into "whea, whea, pddrt, pddrt, whea, whea, pdrrt" phrases. Flight song, given while flying in wide circle 15-30 m up, described as "whit-whit-whit-whit-whit-weak-wheat-wheat-stiddle-d-doo-stiddle-d-doo". Bill-snapping during aggressive encounters and aerial foraging.

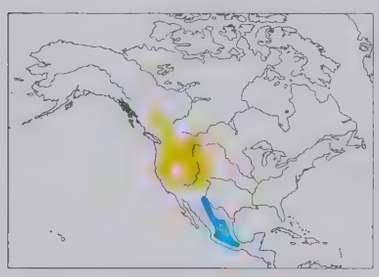
Habitat. Breeds in arid woodlands and shrublands, typically large sagebrush (*Artemisia*), often mixed with antelope brush (*Purshia*), rabbitbrush (*Chrysothamnus*), mountain mahogany (*Cercocarpus ledifolius*), piñon pine (*Pinus edulis*), juniper (*Juniperus*) or ponderosa pine (*Pinus ponderosa*); mature open forest of ponderosa pine, white fir (*Abies concolor*) and incense cedar (*Calocedrus decurrens*) with sagebrush understorey and in Jeffrey pine (*Pinus jeffreyi*) forest with shrub understorey in NE California; open woodland of ponderosa pine, Gary oak (*Quercus garryana*) and Douglas fir (*Pseudotsuga taxifolia*) with bare understorey in Washington. During migration, also riparian willow (*Salix*) thickets and brushy fields in NW California, arid chaparral with oaks and grey pine (*Pinus sabiniana*) in foothills of W Sierra Nevada, and riparian oases, mesquite (*Prosopis*) and low oaks (*Quercus*) through the Great Basin and Mojave, Sonoran and Chihuahuan Deserts. Winters in arid open to semi-open scrub, woodland, thorn-forest, riparian woodland and mesquite. Winters from sea-level to 2500 m in W Mexico, usually below 2200 m in Arizona. *E. hammondii* usually found higher in tall coniferous forest, and *E. oberholseri* lower in chaparral and small trees.
Food and Feeding. Insects; possibly some fruit in winter. Searches for prey while perched on lowest branches of large conifers, or on dead branch or top of large bush or shrub; perches upright, slowly dips tail downwards in distinctive motion. Captures prey in flight, using sally manoeuvres directed to air, foliage, bark, branches or ground.
Breeding. Late May to mid-Aug; double brooded. Nest cup constructed of grass, pine needles, bark shreds and sage panicles, lined with soft grass, feathers and animal hair, average outside diameter 12·1 cm, height 6·1 cm, inside diameter 6·8 cm, depth 4·6 cm, more flat and coarse than nest of *E. oberholseri*; placed in fork low in bush or shrub or on top of large branches, average 5·4 m up in California (Black Mt), 0·6-3·4 m up in N Arizona, plants include pines, juniper, Douglas fir, bitterbrush (*Purshia tridentate*) and sagebrush. Clutch 3-4 eggs; incubation period 14-15 days; fledging period c. 16 days. Of 16 nests in NE California, seven successfully fledged more than more young. Sexually mature in first breeding season after hatching.
Movements. Short-distance to medium-distance migrant, wintering mostly in Mexico. Migrates at night. Departs breeding grounds early, from Aug to mid-Sept, migrating W of Cascades and Sierra Nevada, arriving on wintering grounds Aug-Sept. N return through Great Basin, E of Cascades and Sierra Nevada and through SW USA, reaching breeding grounds mid-Apr to late May, males generally arriving c. 1 week before females. Migration periods last c. 7 weeks. Vagrant in E North America, usually in autumn or winter.
Status and Conservation. Not globally threatened. Common, increasing; overall numbers estimated at 1,200,000 birds. Reported densities of 10-30 singing males/km². Estimated 167,000 breeding pairs in Colorado, representing 10-19% of total population. Survey data indicate rangewide population increase of 11·6% annually between 1966 and 1995; range expanded 320 km N through C Washington into British Columbia (Okanagan Valley) during 1970-1987, and recent range expansions also reported in SW California. Some local populations eliminated by clear-cutting of conifer woods for cattle pasture and mining operations. Fragmentation of forest may also lead to increase in Brown-headed Cowbird (*Molothrus ater*) numbers and consequent increase in nest parasitism.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bent (1942), Binford (1989), Campbell *et al.* (1997), Cory & Hellmayr (1927), DeGraaf & Rappole (1995), Finch (1991), Fitzpatrick (1980a), Gaines (1992), Grinnell & Miller (1944), Harris (1996), Hejl *et al.* (1995), Hoffman (1927), Howell & Webb (1995a), Hutto (1992), Johnson (1963a), Kaufman (1996), Lavers (1975), Peterjohn *et al.* (1995), Price *et al.* (1995), Pyle (1997b), Ridgway (1907), Root (1988), Russell, H.N. & Woodbury (1941), Russell, S.M. & Monson (1998), Sauer & Droege (1992), Sedgwick (1998b), Sibley (2000), Small (1994), Sternling (1999), Udvardy (1963), Whitney & Kaufman (1986), Yaich & Larrison (1973).

236. **Dusky Flycatcher**

Empidonax oberholseri

French: Moucherolle sombre **German**: Buschland-Schnäppertyrann **Spanish**: Mosquero Oscuro

Taxonomy. *Empidonax oberholseri* A. R. Phillips, 1939, Hart Prairie, San Francisco Mountain, Arizona, USA.
Formerly considered conspecific with *E. wrightii*, although appears not to be closely related. Monotypic.
Distribution. Breeds W Canada (N British Columbia E to SW Saskatchewan) S in W USA (mainly W of Rocky Mts) to S California and NE New Mexico. Winters SW USA (E to W Texas) and Mexico (S, mainly in highlands, to Oaxaca).



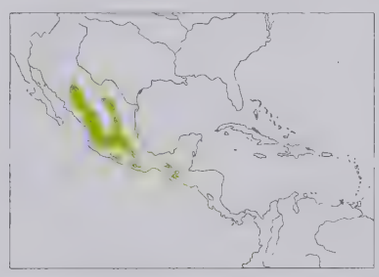
Descriptive notes. 13-15·2 cm; 9·3-11·4 g. Has bold white eyering and supraloral line; greyish-olive crown, slight rounded crest; head side, nape and upperparts greyish-olive; wings dusky, two narrow white wingbars, indistinct narrow white margins of secondaries and tertials; short primary projection; tail of medium length, narrow, tip square or notched, dusky with white outer webs of outer rectrices; throat whitish to pale grey, breast whitish with pale olive-grey wash across chest, lower belly and undertail-coverts washed pale yellow; plumage varies with wear (moults after migrating to wintering grounds), brighter with browner crown and upperparts and brighter yellow below in fresh plumage, becomes duller and paler with wear; iris dark; bill small and narrow, upper mandible black, lower mandible dark with yellowish-orange at base; legs blackish. Best distinguished from similar *E. hammondii* by voice, also habitat, and by longer bill, more conspicuous eyering and lores, shorter primary projection, more rounded tail, slightly longer tarsus, also by timing of moult; from *E. wrightii* by shorter bill, wing morphology, slightly darker upperparts, bill pattern. Sexes similar. Juvenile resembles adult, but broader and buffier wingbars, brighter and browner upperparts, more extensive orange-yellow on lower mandible. Voice. Common call a dry "whit". Song consists of three elements, a rising "prll-it" or "sibip", a clear lower "prrdrrt" or "quwerrrp" and a high "pseet" or "psuweet", given in any combination, sometimes with twittering note added in, e.g. as "prll-it" or "prll-it pseet orprll-it, prrdrrt, prrll-it pseet" or "prrll-it, d-d-d-d". Twittering solicitation call "d-d-d-d", frequently combined with "prll-it" song. Flight song described as "whit-whit-whit-whit whit-week-wheak-wheak-wheak-buzeek-buzeek-buzeek-stiddle-d-doo-stiddle-d-doo-stiddle-d-doo". Also unique "du-hic" or "dee-hic" call throughout breeding season (more frequently from pair-formation to incubation), early and late in day; also a "bdrrt" rattle call. Loud high "wheak" or "whee-o" during aggressive encounters, chases, copulation and during flight song. Bill-snapping during aggressive encounters.
Habitat. Breeds in open coniferous forest, mountain chaparral, aspen (*Populus*) groves, willow (*Salix*) thickets, open brushy areas and scrub, often on mountainsides; pine forest with dense understorey of saplings or mixed coniferous forest with chaparral understorey of *Arctostaphylos*, *Ceanothus*, *Ribes*, *Prunus*, *Cercocarpus* or *Abies* in California; mixed forest with ponderosa pine (*Pinus ponderosa*) and Douglas fir (*Pseudotsuga menziesii*) and shrubby clearings in W Montana. Requirements similar but less restricted during migration, preferring shady broadleaf vegetation. Winter habitats similar to breeding ones, also arid to semi-arid scrub, oak (*Quercus*) scrub, shrubby clearings, riparian and woodland edges, and pine-oak woodlands. Breeds at 650-2300 m in Canada (British Columbia); 1000-3000 m in non-breeding range in Mexico, lower (to sea-level) during migration. *E. hammondii* usually found higher in tall coniferous forest, and *E. wrightii* in sagebrush (*Artemisia*) and more arid habitats.
Food and Feeding. Insects, including adult and larval lepidopterans, dipterans, hymenopterans, orthopterans, and Odonata. Searches for prey while perched on small dead branches and twigs; perches upright, often jerks tail up. Captures prey in flight, using sally and hover-glean manoeuvres directed to air, foliage, bark, branches or occasionally the ground; items sometimes shaken, beaten or crushed against perch to remove wings or otherwise to prepare them for consumption.
Breeding. Late May to Aug. Nest built by female, neatly woven cup made of grass and finely shredded plant materials, lined with fine weed bark, grass, animal hair, vegetable down, feathers, bud scales, beard lichen (*Usnea*) and pine needles, average outside diameter 7·4 cm, height 7·2 cm, inside diameter 5·3 cm, depth 3·6 cm; placed in upright crotch on average 2 m up in tree or bush, including willow (*Salix*), alder (*Alnus*), chokecherry (*Prunus virginiana*), Rocky Mountain maple (*Acer glabrum*), mallow ninebark (*Physocarpus malvaceus*), aspen (*Populus tremuloides*), sagebrush (*Artemisia*) and Rocky Mountain juniper (*Juniperus scopulorum*). Clutch 4 eggs; if first clutch nest lost, renesting clutch 2-4 eggs; incubation period 15-16 days; fledging period 17-18 days. Nesting success 40% in W Montana; occasionally parasitized by Brown-headed Cowbird (*Molothrus ater*). Breeds at 1 year of age. Longevity record 8 years.
Movements. Migrant, wintering SW USA and Mexico. Departs breeding grounds Aug, passing through Mexico Aug-Sept; leaves wintering grounds Apr-May, migrating through mountains of Arizona to arrive on breeding grounds late Apr-May, males typically 1 week before females. Vagrant in E North America.
Status and Conservation. Not globally threatened. Common; overall numbers estimated at 3,600,000 birds. Survey data show population increase of on average 3·6% annually between 1966 and 1991 in USA, although no significant trend across North America. Probably benefits from increase in shrubby habitat following thinning of dense coniferous forests. Populations inhabiting willow thickets and other riparian areas perhaps vulnerable to habitat degradation through water-management programmes, livestock grazing and other human activities. Loss and alteration of wooded habitats in wintering range may also have a negative effect (e.g. Mexican high-elevation forests have been extensively logged and overgrazed).
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Beaver & Baldwin (1975), Bent (1942), Campbell *et al.* (1997), DeGraaf & Rappole (1995), Eckhardt (1977), Edwards (1972), Finch (1991), Fitzpatrick (1980a), Howell & Webb (1995a), Johnsgard (1979), Johnson (1963a), Kaufman (1996), Hejl *et al.* (1995), Lein (2002), Liebezeit & George (2002), Pereyra & Morton (2001), Peterjohn *et al.* (1995), Phillips *et al.* (1964), Price *et al.* (1995), Pyle (1997b), Pyle *et al.* (1987), Root (1988), Sedgwick (1975, 1993a, 1993b), Sibley (2000), Small (1994), Udvardy (1963).

237. **Pine Flycatcher**

Empidonax affinis

French: Moucherolle des pins **Spanish**: Mosquero de los Pinos
German: Kiefernschnäppertyrann

Taxonomy. *Tyrannula affinis* Swainson, 1827, Temascaltepec, Mexico.
Vocal differences between populations N & S of Isthmus of Tehuantepec suggest to some that more than one species may be involved. Five subspecies recognized.
Subspecies and Distribution.
E. a. pulverius Brewster, 1889 - NW Mexico, from Sonora and Chihuahua S to Jalisco.
E. a. trepidus Nelson, 1901 - NE Mexico (Coahuila, Tamaulipas); winters S to S Mexico (Chiapas) and Guatemala.
E. a. affinis (Swainson, 1827) - S Mexican Plateau (Michoacán S to Puebla).
E. a. vigensis A. R. Phillips, 1942 - Veracruz, in SE Mexico.
E. a. bairdi P. L. Sclater, 1858 - S Mexico (Guerrero and Oaxaca, possibly Chiapas), possibly also W Guatemala.



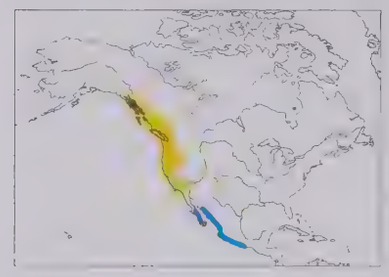
Descriptive notes. 13-14·5 cm; 11·5 g. Nominate race has pale greyish lores, whitish teardrop-shaped eye-ring extending to point behind eye; crown olive to greyish-olive; head side, nape and upperparts olive to greyish-olive; wings dusky, whitish to buff wingbars, pale yellow edges of secondaries and tertials (forming panel on secondaries of closed wing); tail dusky; throat pale greyish-yellow, underparts pale yellow, grey or greyish-olive wash across chest; iris dark; bill relatively narrow, upper mandible black, lower mandible orange-yellow; legs blackish. Differs from *E. difficilis* in generally narrower bill, also generally slimmer and longer-winged, with less contrasting wingbars, thicker eye-ring with different shape and colour. Sexes similar. Juvenile has buffy wingbars. Races vary subtly in plumage: *pulverius* is greyest on back and breastband; *trepidus* is slightly less dull than nominate, has dark olive crown that contrasts with brighter olive back, olive breastband; *vigensis* is like nominate, but duller still; *bairdi* is perhaps greener on back, slightly yellower below. Voice. Call "whip", "pwip" or "whiup", distinct from "whit" call of congeners. In N & C Mexico song consists of 2-4 phrases, "prrp, p-wiet, chit p-p-p-p-reer" or "p-rip, p-rip, p'rr-ree", also gives fast alarm trill "dri-i-irr" and "chu-wik" call; song in Chiapas different, "chri-k whee-u', chik-wheer" or "cheenk, cheenk, t-weeree".
Habitat. Interior, edge and semi-open areas within semi-arid to humid pine-oak (*Pinus-Quercus*) forest; 1600-3500 m.
Food and Feeding. Little known. Insects. Forages at low to high levels; similar to *E. hammondii*.
Breeding. Little known. Territorial birds reported in late May (Chiapas). Nest cup placed in fork of tree at middle level of forest. No other information.
Movements. Resident; suspected local wandering during autumn and winter, perhaps becoming more abundant in N part of range in winter.
Status and Conservation. Not globally threatened. Common to fairly common, but often local.
Bibliography. Anon. (1998a), Binford (1989), DeGraaf & Rappole (1995), Fitzpatrick (1980a), Howell & Webb (1995a), Land (1970), Schaldach (1963), Stotz *et al.* (1996), Urban (1959), Wetmore (1941).

238. Pacific-slope Flycatcher

Empidonax difficilis

French: Moucherolle côtier **Spanish**: Mosquero del Pacífico
German: Feuchtwald-Schnäppertyrann
Other common names: Coastal/Redwoods Flycatcher; Western Flycatcher (when grouped with *E. occidentalis*)

Taxonomy. *Empidonax difficilis* S. F. Baird, 1858, Fort Steilacoom, Washington, USA.
Formerly treated as conspecific with *E. occidentalis*; separated on grounds of differences in voice, morphology and allozymes, but this treatment questioned by some authorities; further study perhaps warranted in area where the two contact each other (interior NW of North America). Sometimes *E. flavescens* considered conspecific. Channel Is race *insulicola* possibly a separate species, differs from mainland populations in morphology, voice, habitat use and genetics. Three subspecies recognized.
Subspecies and Distribution.
E. d. difficilis S. F. Baird, 1858 - breeds from SE Alaska S to S California (generally W of Sierra Nevadas) and extreme NW Mexico (N Baja California); winters W Mexico (S to S Baja California, Sinaloa and Oaxaca).
E. d. insulicola Oberholser, 1897 - breeds on Channel Is, off S California (USA); winter range unknown.
E. d. cineritius Brewster, 1888 - Sierra de la Laguna (Victoria Mts), in Cape District (S Baja California).



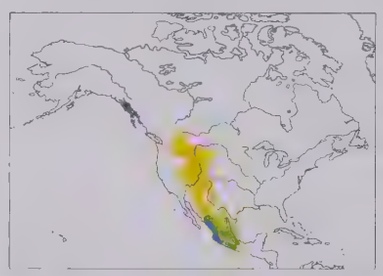
Descriptive notes. 14-17 cm; 9-12 g. Large-headed flycatcher. Nominate race has indistinct pale supraloral line, distinct white to dull yellowish teardrop-shaped eyering extending to a point behind eye (often slightly broken on top); olive-green crown, distinct slightly bushy crest; ear-coverts, nape and upperparts olive-green, rump browner than back; wings blackish-brown, dingy pale yellow wingbars on median and greater wing-coverts, pale yellow margins of secondaries and tertials (forming panel on secondaries of closed wing); tail fairly long, narrow, dusky; throat dull pale yellow, underparts mustard-yellow with olive wash across chest, belly slightly paler; in worn plumage is greyer above, paler and more whitish below, wingbars and edges of remiges narrower and whiter; iris dark; bill broad, upper mandible black, lower mandible orange-yellow; legs grey. Distinguished from very similar *E. occidentalis* by on average smaller size and smaller bill; from *E. affinis* by chunkier build, shorter wings, more contrast in wingbars, less distinct eyering with different shape and colour, generally wider bill. Sexes similar. Juvenile is similar to adult, but buffy to cinnamon wingbars, more brownish upperparts. Races vary in size and colour: *cineritius* is smallest, back more drab greyish-brown than nominate, also longer wing and longer bill; *insulicola* is larger and greyer, longer-billed and longer-winged than mainland races. Voice. Song "ps-séét ptsick seet" or "tséé-wee pttuck tseep", often rapidly repeated such that intervals between songs no longer than those between the three song elements, some syllables occasionally replaced by position notes. Dawn song similar, "si tí-swéé pi-tik", "si p-séép p-tup" or "whi see-it si-it si-ip p-tik". Male position note upslurred "pee-fst", "pewéáp" or "pawee", similar to "ptsick" component of song (important for distinguishing from *E. occidentalis*); female position note a brief "tsip" or "tsit", similar to "seet" portion of song. Harsh "chrrip", "prrit" or "chrr" during aggressive encounters; soft "peet" often heard during migration (distinct from "whit" or "pic" of many congeners). Other vocalizations include "ti-ti-ti" and "weer-weet-weet" calls. Bill-snapping during aggressive encounters.
Habitat. Breeds in humid to semi-arid pine-oak (*Pinus-Quercus*), coniferous and dense secondary forest, often near streams, ravines and other waterbodies. Habitats include mature second-growth/old-growth Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*) and mixed coniferous-deciduous forests in coastal British Columbia; also western red cedar (*Thuja plicata*), alder (*Alnus*), cottonwood (*Populus*), willow (*Salix*), sugar pine (*Pinus lambertiana*), incense cedar (*Calocedrus decurrens*) and forests with understorey containing dogwood (*Cornus*), big-leaf maple (*Acer macrophyllum*), currant (*Ribes*) and alder saplings in Washington and Oregon; also redwood (*Sequoia sempervirens*), Pacific madrone (*Arbutus menziesii*), tanoak (*Lithocarpus densiflorus*) and black oak (*Quercus velutina*) in California. On Channel Is (race *insulicola*) drier habitats, including eucalypt (*Eucalyptus*) groves, oak clumps in canyon bottoms, coastal scrub and *Opuntia* cactus. During migration uses shaded forest habitats; shady oases as stopovers through deserts; willows, Monterey cypress (*Cupressus macrocarpa*) and eucalypts along California coast in late summer. Winters in montane evergreen forest, gallery forest, tropical deciduous forest and tropical lowland evergreen forest. Near sea-level to 1310 m in NW North America; 1000-3500 m in Mexico.
Food and Feeding. Arthropods; occasionally fruit. Arthropods include hymenopterans, coleopterans (of family Coccinellidae), bugs (Hemiptera), flies (Diptera), larval and adult lepidopterans, homopteran bugs (Cicadellidae), arachnids; fruits include blackberry (*Rubus*), elderberry (*Sambucus*), tarweed (*Madia*). Searches while perched in low to middle canopy or along margins of riparian vegetation. Sallies out to hawk insects from the air or to glean prey from foliage and branches, average sally distance 1·68 m, afterwards continuing to new perch.
Breeding. Mid-Apr to Jul; double-brooded. Nest a slightly oval cup made of moss, lichens (*Ramalina menziesii*, *Usnea*, *Hypogymnia inactiva*), bark strips and pieces, midribs of large leaves, grass stems, twigs and feathers, bound with spiderweb, lined with fine grass, average external length and width 11·9 × 10·2 cm, internal 4·6 × 2·8 cm; placed in site offering support from below and behind and often with overhead cover, including vertical tree fork, tree cavity, bank shelf, behind loose bark, and artificial structure (building, bridge, roadcut), and often near water; in Alaska 12-28 m up within thick moss covering Sitka spruce (*Picea sitchensis*) or cottonwood branches, in British Columbia 0·3-13 m (mostly 1·3-2·8 m) above ground in tree or shrub including red alder (*Alnus rubra*), wild rose (*Rosa*), Douglas fir, western red cedar, willow, vine maple (*Acer circinatum*), Garry oak (*Quercus garryana*), poplar and spruce; nest-sites reused. Clutch 1-5 eggs, usually 4; incubation period 13-16 days; fledging period 14-17 days. Breeds in first season. Longevity record 6 years.
Movements. Medium-distance migrant, wintering in Mexico; breeding birds in S Baja California (race *cineritius*) resident. Departs breeding grounds late Jul to Oct, adults earlier than juveniles; passes through lower R Colorado (in Arizona) late Jul to mid-Oct; leaves wintering grounds mid-Mar to Jun, peak from mid-Apr to mid-May. Vagrants recorded from Gulf coast of USA and E North America.
Status and Conservation. Not globally threatened. Common to fairly common; overall population estimated at 8,300,000 birds. Densities in California (Douglas fir and oak forest in Humboldt and Trinity counties) 1·3 birds/ha in forest at least 200 years old, 0·8/ha in forest 91-199 years old, and 0·1/ha in forest 30-90 years old. Survey data show no significant trends in population size between 1966 and 1996; although populations on Vancouver I (Canada) appeared to increase by 5·3% annually, numbers declined in Douglas fir forests of NW California. Has extended its range N in British Columbia.
Bibliography. Ainsley (1992), Anon. (1998a), Armstrong (1983), Baicich & Harrison (1997), Bailey (1983), Bent (1942), Binford (1989), Campbell *et al.* (1997), Cory & Hellmayr (1927), Davis *et al.* (1963), DeGraaf & Rappole (1995), Faxon & Bayer (1991), Frakes & Johnson (1982), Fitzpatrick (1980a), Gabrielson & Lincoln (1959), Howell & Webb (1995a), Hutto (1980), Johnson, N.K. (1963a, 1973, 1980), Johnson, N.K. & Marten (1988), Kaufman (1996), Lowther (2000), Nelson (1995), Phillips (1994b), Price *et al.* (1995), Pyle (1997b), Raphael *et al.* (1988), Root (1988), Rosenberg *et al.* (1991), Ridgway (1907), Sakai (1988), Sauer *et al.* (1997), Sibley (2000), Small (1994), Stewart *et al.* (1974), Stotz *et al.* (1996), Udvardy (1963), Verbeek (1975), Whitney & Kaufman (1986).

239. Cordilleran Flycatcher

Empidonax occidentalis

French: Moucherolle des ravins **Spanish**: Mosquero Cordillerano
German: Hochland-Schnäppertyrann
Other common names: Western Flycatcher (when grouped with *E. difficilis*)

Taxonomy. *Empidonax bairdi occidentalis* Nelson, 1897, Pluma, Oaxaca, Mexico.
Formerly treated as conspecific with *E. difficilis*; separated on grounds of differences in voice, morphology and allozymes, but this treatment questioned by some authorities; further study perhaps warranted in area where the two contact each other (interior NW of North America). Geographical variation in size and colour perhaps clinal. Two subspecies recognized.
Subspecies and Distribution.
E. o. hellmayri Brodkorb 1935 - breeds interior W North America from S Canada (WC Alberta, N Rocky Mts region) and USA (S to NE California, S Nevada, C & SE Arizona, SW Texas) S to N Mexico (Sierra Madre Occidental of Sonora and Chihuahua, and N Coahuila); winters Mexico.
E. o. occidentalis Nelson 1897 - highlands of Mexico, from Durango, SE Sinaloa, SE Coahuila and Nuevo León S to Guerrero, SC Oaxaca and W Veracruz.



Descriptive notes. 13-17 cm; 9-12 g. Large-headed flycatcher. Has indistinct pale supraloral line, distinct white to dull yellowish teardrop-shaped eyering extending to a point behind eye (often slightly broken on top); olive-green crown, distinct slightly bushy crest; ear-coverts, nape and upperparts olive-green, rump browner than back; wings blackish-brown, dingy pale yellow wingbars on median and greater wing-coverts, pale margins of secondaries and tertials (forming panel on secondaries of closed wing); tail fairly long, narrow, dusky; throat dull pale yellow, underparts mustard-yellow, olive wash across chest, belly slightly paler; in worn plumage is greyer above, paler and more whitish below, wingbars and edges of remiges narrower and whiter; iris dark; bill broad, upper mandible black, lower mandible orange-yellow; legs grey. Distinguished with difficulty from *E. difficilis* by on average heavier build and larger bill, greener coloration above, yellower below; from *E. affinis* by generally wider bill, also chunkier shape and shorter wings, more contrast in wingbars, less distinct eyering with different shape and colour. Sexes similar, female on average slightly smaller than male. Juvenile has buffy to cinnamon wingbars, more brownish upperparts. Race *hellmayri* is larger than nominate, brighter on breast, with longer wing and bill. Voice. Song "ps-séét ptsick seet" or "tséé-wee pttuck tseep", often rapidly repeated such that intervals between songs no longer than those between the three song elements, some syllables occasionally replaced by position notes. Dawn song similar, "sii swéé'ín pi-luk or "si wéé-éé pi-dik". Male position note "pit-péét" or "wee-eee" (important for distinguishing from *E. difficilis*); female position note a brief "tsip" or "tsit", similar to "seet" part of song. Soft "peet" often heard during migration (distinct from "whit" or "pic" of many congeners). Bill-snapping during aggressive encounters.
Habitat. Breeds in humid to semi-arid pine-oak (*Pinus-Quercus*) and coniferous forest, often near streams, ravines or openings, typically including Engelmann spruce (*Picea engelmannii*), lodgepole pine (*Pinus contorta*), ponderosa pine (*P. ponderosa*), Jeffrey pine (*P. jeffreyi*), white fir (*Abies concolor*), quaking aspen (*Populus tremuloides*) and black cottonwood (*P. trichocarpa*); also subalpine fir (*A. lasiocarpa*) and bristlecone pine (*P. longaeva*) in Nevada; birch (*Betula*), ponderosa pine with understorey of maple, chokecherry (*Prunus virginiana*), and chapparal in South Dakota; Douglas fir (*Pseudotsuga menziesii*), white fir, ponderosa pine, white pine (*Pinus strobiformis*), Gambel's oak (*Quercus gambelii*), and understorey of canyon maple (*Acer grandidentatum*) and New Mexico locust (*Robinia neomexicana*) in Arizona; forested canyon bottoms of basswood (*Tilia*), maple, Douglas fir and oaks in Sierra de Carmen (N Coahuila, in Mexico). During migration uses shaded forest habitats; shady oases as stopovers through deserts. Winters in montane evergreen forest, gallery forest, tropical deciduous forest, tropical lowland evergreen forest. Perhaps prefers more cool, arid and dense habitats than *E. difficilis*. At 1000-3500 m in Mexico; above 2600 m in Arizona snowmelt drainages.
Food and Feeding. Insects; occasionally fruit. Searches for prey while perched 0-9 m up; sallies usually 1-2 m to hawk insects from the air or to glean prey from foliage and branches, afterwards continuing to new perch.
Breeding. Late Apr to Jul in Canada and USA, and Mar-Sept in Mexico; double-brooded. Nest a cup made of green moss, bark strips and rootlets, bound by spiderweb, placed 0·2-9 m up in site offering support from below and behind and often with overhead cover, including rock face and outcropping, tree cavity, root mass of upturned tree, tree stump, between shelf fungus and tree trunk, streambank, rotten log and artificial structure; old nest-sites reused. Clutch 2-5 eggs, usually 3-4; no information on incubation and fledging periods.
Movements. N populations medium-distance migrants, wintering in Mexico. Generally departs breeding grounds in USA late Aug and Sept; arrives on breeding grounds in USA mid-Apr to mid-May. In Mexico, most descend to foothills and Pacific lowlands, and to 600-1500 m on Atlantic slope, in winter.
Status and Conservation. Not globally threatened. Common to fairly common; total population estimated at 2,600,000 birds. Survey data show no significant decline or increase in population size between 1966 and 1996.
Bibliography. Andrews & Righter (1992), Anon. (1998a), Baicich & Harrison (1997), Bailey (1983), Binford (1989), Brawn & Balda (1988b), Campbell *et al.* (1997), DeGraaf & Rappole (1995), Dorn & Dorn (1990), Gilligan *et al.* (1994), Hejl *et al.* (1995), Howell & Webb (1995a), Johnson, A. (1994), Johnson, N.K. (1980), Johnson, N.K. & Marten (1988), Kaufman (1996), Littlefield (1990), Lowther (2000), Martin & Li (1992), Miller (1955b), Oberholser (1974), Phillips (1994b), Phillips *et al.* (1964), Price *et al.* (1995), Pyle (1997b), Rosenberg *et al.* (1991), Rowley (1966, 1984), Sauer *et al.* (1997), Small (1994), Stotz *et al.* (1996), Wauer (1997), Weske (1976), Whitney & Kaufman (1986), Zimmer (1985).

240. Yellowish Flycatcher

Empidonax flavescens

French: Moucherolle jaunâtre **Spanish**: Mosquero Amarillento
German: Sumpfschnäppertyrann
Other common names: Interior/Ponderosa Flycatcher

Taxonomy. *Empidonax flavescens* Lawrence, 1865, Barranca, Costa Rica.
Sometimes considered conspecific with *E. difficilis*. Three subspecies recognized.
Subspecies and Distribution.
E. f. salvini Ridgway, 1886 - highlands of SE Mexico (S from E Oaxaca) S to N Nicaragua.
E. f. imperturbatus Wetmore, 1942 - Sierra de Tuxtla, in SE Veracruz (Mexico).
E. f. flavescens Lawrence, 1865 - highlands of Costa Rica and W Panama.



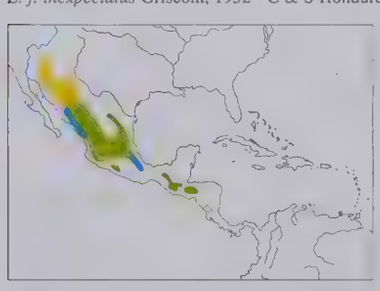
Descriptive notes. 12·5-14 cm; 12 g. Nominate race has indistinctly pale lores, prominent pale yellow teardrop-shaped eyering extending to point behind eye; crown olive-green, slightly crested; head side, nape and upperparts bright olive-green; wings and tail dusky brown, two dull brown wingbars, buffier or yellowish margins of secondaries and tertials (forming panel on secondaries of closed wing); throat pale yellow, breast washed olive and sometimes tinged ochre, belly and vent yellow; iris dark; bill broad, upper mandible black, lower mandible orange-yellow; legs grey. Distinguished from *E. difficilis* and *E. occidentalis* by brighter overall coloration, browner wingbars, perhaps bolder eyering. Sexes similar. Juvenile is brownish-olive above, wingbars broader and buffy to cinnamon, browner on chest, paler yellow below, almost white on belly. Race *salvini* is slightly darker above than nominate, more extensively olive without ochre tinge below, breastband less distinct from belly, belly more olive-yellow; *imperturbatus* is similar to previous. Voice. Call a high thin "seee", "tseeep", "tsee'n" or "see-ip", much like that of *E. occidentalis*, or shorter "tsick" notes given in series. Dawn song, from high perch, a high thin "si-iin ch-ik w-seein" or "see see chit" (sometimes without the "ch-ik" or "chit" note), 20 times per minute.
Habitat. Openings and borders of cool moist montane evergreen and broadleaf forests and mixed pine (*Pinus*) forest, also shady pastures and second growth; also plantations and gardens. At 900-3000 m in Mexico; in Costa Rica, 800-2150 m on Caribbean slope and 1200-2450 m on Pacific slope.
Food and Feeding. Food primarily insects and spiders, also some berries. Searches for prey from low to high perches; sits upright, flicks tail. Uses short aerial sallies and hover-glean manoeuvres directed to air, foliage, bark and the ground. Does not associate with mixed flocks.
Breeding. Mar-Jun in Costa Rica. Nest a cup made of moss, liverworts and rootlets, lined with fine plant fibres, grasses, hair and papery bark, placed 2-4·5 m up in vertical fork or within depression in large trunk, earthen bank or cliff, often hidden by overhanging vegetation. Clutch 2-3 eggs; no other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to common. Given its tolerance of converted habitat, it is considered not likely to become threatened in near future. Occurs in Tapantí National Park, in Costa Rica.
Bibliography. Anon. (1998a), Binford (1989), Blake, E.R. (1953, 1958), Cory & Hellmayr (1927), Dearborn (1907), Fitzpatrick (1980a), Gómez de Silva *et al.* (1999), González-García (1993), Henderson (2002), Howell & Webb (1995a), Johnson, N.K. (1980), Land (1970), Monroe (1968), Paynter (1957), Ridgely & Gwynne (1989), Ridgway (1907), Rowley (1984), Skutch (1967), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1943, 1972).

241. Buff-breasted Flycatcher

Empidonax fulvifrons

French: Moucherolle beige **Spanish**: Mosquero Pechicanelo
German: Orangebrust-Schnäppertyrann

Taxonomy. *Muscicapa fulvifrons* Giraud, 1841, Miquiahuana, Tamaulipas, Mexico.
Validity of several races doubted, nominate and *brodkorbi* known only from holotype specimens; further work necessary. Six subspecies currently recognized.
Subspecies and Distribution.
E. f. pygmaeus Coues, 1865 - SW USA (EC & SE Arizona, at least formerly WC & SW New Mexico) and NW Mexico (Sonora, S Coahuila); winters SC Mexico (S to Michoacán and Morelos).
E. f. rubicundus Cabanis & Heine, 1859 - highlands in C Mexico locally from Durango S to Morelos and Puebla; winters S to Guatemala.
E. f. fulvifrons (Giraud, 1841) - Tamaulipas (E Mexico).
E. f. fusciceps Nelson, 1904 - highlands of S Mexico (from Oaxaca) S locally to Guatemala and El Salvador.
E. f. brodkorbi A. R. Phillips, 1966 - S Oaxaca (S Mexico).
E. f. inexpectatus Griscom, 1932 - C & S Honduras.



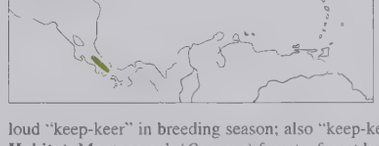
Descriptive notes. 11·5-13 cm; 8 g. Small, distinctively coloured *Empidonax*. Nominate race has pale supraloral line, prominent white eyering; rest of head and nape and upperparts brown to grey-brown; wings dusky brown, two prominent cinnamon-buff to white wingbars, white to pale yellow margins of secondaries and tertials (forming panel on secondaries of closed wing); tail dusky, white outer web of outer rectrix; pale orange-buff below, darkest on breast; plumage varies with wear, brown tones strongest when fresh, greyest when worn, warm tones of underparts become paler buff with wear; iris dark brown; bill short, small and wide, upper mandible black, lower mandible orange-yellow; legs black. Sexes similar. Juvenile is similar to adult, but wingbars broader and brighter cinnamon. Races vary in plumage: *rubicundus* has warm brown crown and back, resembles nominate; *inexpectatus* has dark brown crown contrasting with back, darker brown upperparts and wings than previous; *pygmaeus* is smaller, dull pale grey above, paler buff below, much paler throat and belly; *fusciceps* is darker and more richly coloured. Voice. Common call "pit" or "pic". Song, by both sexes during breeding, male from perch 1-20 m high, a series of sharp short phrases, "p-teek, pit p-teek pi-tik, peek pi-chu…", "sipit siu, sipit piu", or "chee-lick" or chee-lick chou" (with "chou" sometimes trilled). Also "quit-quit" or "quit-quit-quir-r-r" as alarm. Bill-snapping while foraging also reported.
Habitat. Breeds in scrub, pastures, and pine (*Pinus*) and oak (*Quercus*) woodland with open understorey, grass and small trees, often in wide canyons or near riparian vegetation. Also oak forest and riparian woodland of sycamore (*Platanus*), cottonwood (*Populus*) and willow (*Salix*) during migration. Winters habitats similar to breeding ones, at lower elevations, as well as thornscrub near riparian woodland. Breeds at 1000-3500 m, in S USA 1950-2850 m, in Honduras and Guatemala 600-2600 m; winters mostly at 600-2500 m, sometimes lower, near sea-level.
Food and Feeding. Arthropods, including hymenopterans, hemipterans, Beetles (Coleoptera), orthopterans, lepidopterans, dragonflies and damselflies (Odonata), neuropterans, arachnids. Searching for prey from perch on tree branch, bush or weed stem, usually at low to middle levels, sometimes in canopy; prey captures made in flight, using short (0·5-3 m) sallies directed to the air or ground.
Breeding. Late May to Jul in USA (Arizona) and mid-Mar to mid-Sept in Mexico. Nest constructed by female, an oval-shaped cup of small rootlets, herbaceous leaves, grass and conifer needles, bound by spiderweb, outside adorned with bark pieces, lichen, leaves and feathers, average outside height 6 cm, length and width 8·5 × 7 cm, inside depth 3·8 cm, length and width 4·4 × 3·3 cm; 2·7-12 m up in sloping fork, on branch or crotch of main trunk at middle level of tree, often protected above by foliage, frequently in Chihuahuan pine (*Pinus leiophylla*), ponderosa pine (*P. arizonica*), Arizona sycamore (*Platanus wrightii*), Arizona white oak (*Quercus arizonica*), Douglas fir (*Pseudotsuga menziesii*) or other tree on hillside or canyon bottom. Clutch 2-5 eggs, usually 3-4; incubation period 14-16 days; fledging period 15-17 days. Average 2·08 fledglings/nest over entire breeding season in USA (Arizona).
Movements. Mainly resident; N populations migrate S and others move downslope in winter. Populations in Arizona and N Sonora leave breeding grounds mid-Aug to mid-Sept, winter in C & S Sonora, return to breeding grounds late Mar/Apr. Some Mexican birds may descend to lower elevations Sept-Apr. Also recorded Nov-Mar in N El Salvador.
Status and Conservation. Not globally threatened. Uncommon to common or fairly common; overall population estimated at 2,000,000 birds. Disappeared from USA during last century; recently, range has apparently expanded N again, but still rather rare and local in SW USA. Natural fires may be important in maintaining preferred open habitats in Arizona, populations possibly increasing following burns. Overgrazing and fire suppression may degrade suitable breeding habitats, while loss and alteration of wooded habitats in Mexico may also have a negative effect.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bent (1942), Binford (1989), Blake & Hanson (1942), Bowers & Dunning (1994), Cory & Hellmayr (1927), Cottam & Knappen (1939), Dearborn (1907), DeGraaf & Rappole (1995), Fitzpatrick (1980a), Fleming & Baker (1963), González-García (1993), Hejl *et al.* (1995), Howell & Webb (1995a), Hutto (1992), Kaufman (1996), Land (1970), Lowery & Dalquest (1951), Martin & Morrison (1998, 1999), Mlodinow & O'Brien (1996), Monroe (1968), Ridgway (1907), Rowley (1966), Schaldach (1963), Stejskal & Witzeman (1984, 1985), Stotz *et al.* (1996), Thurber *et al.* (1987), Udvardy (1963), Urban (1959).

242. Black-capped Flycatcher

Empidonax atriceps

French: Moucherolle à tête noire **Spanish**: Mosquero Cabecinegro
German: Schwarzkappen-Schnäppertyrann

Taxonomy. *Empidonax atriceps* Salvin, 1870, Volcán de Chiriquí, Panama.
Monotypic.
Distribution. Cordilleras of Costa Rica and W Panama (W Chiriquí and adjacent Bocas del Toro).



Descriptive notes. 11·5 cm; 9 g. Has bold white eyering, broken above eye, broad at rear; short-crested black crown contrasts with brownish-olive head side, nape and upperparts; wings dusky, two pale brown wingbars, pale brown margins of secondaries and tertials; tail dusky, white outer webs of outer rectrices; throat white, underparts pale buffish-cinnamon; iris dark; upper mandible black, lower mandible orange-yellow with dark tip; legs blackish. Sexes similar. Juvenile is similar to adult, but black cap slightly duller, upperparts browner, wingbars and margins of remiges buffy, belly paler. Voice. Call a simple whistled "tsip", "chip" or "whit"; loud "keep-keer" in breeding season; also "keep-keep-keep-keep" during interactions.
Habitat. Montane oak (*Quercus*) forests, forest borders and clearings, brushy second growth, pastures, and edges of *páramo*. In Costa Rica 2450-3300 m, locally down to 2100 m, and may descend to 1850 m at height of rainy season; mainly above 2100 m in Panama.
Food and Feeding. Insects, including dipterans, coleopterans and lepidopterans. Searches for prey from exposed perch, either high in canopy of montane forest or low on top of small bush or fence; perches upright. Uses aerial-sally manoeuvres, afterwards often returning to same perch; quickly flicks tail up and vibrates it upon landing.
Breeding. Mar-May. Nest a cup made of fine grass and moss, lined with fine plant fibres, horsehair, small feathers and bear lichen (*Usnea*), 2-12 m above ground, either saddled in upright fork in tree or shrub, or suspended from attached grass below edge of low embankment. Clutch 2 eggs; no other information.
Movements. Presumably resident; some move downslope during height of rainy season.
Status and Conservation. Not globally threatened. Restricted-range species: present in Costa Rica and Panama Highlands EBA. Fairly common to common. Highland forests in this species' range have been extensively destroyed by burning, logging and agricultural conversion; 50% of Costa Rica's forests destroyed since 1940, and current deforestation rate of c. 3% means that soon forests will survive only in protected areas. In Panama E of Chiriquí, only forest fragments remain, and local extinction of forest-dependent species is likely; this tyrannid is, however, fairly common in shrubby clearings along upper Boquete Trail above Cerro Punta. Perhaps benefits from shrubby second-growth vegetation arising following habitat disturbance or pasture abandonment.
Bibliography. Blake (1958), Cory & Hellmayr (1927), Eisenmann (1955), Fitzpatrick (1980a), Henderson (2002), McLellan (1938), Ridgely & Gwynne (1989), Ridgway (1907), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1972).


inches 3
cm 8
PLATE 33
243
typical
244
pale-bellied
245
ssp ardosiacus
ssp fumigatus
246
247
248
249
ssp cinereus
ssp aithalodes
250
ssp caribaeus
ssp bahamensis
251
ssp punensis
ssp surinamensis
252
ssp brunneicapillus
253
254
ssp blancoi
ssp latirostris
ssp phaeocercus
ssp nerlyi
255
256
257
ssp aurantiiventris
ssp berlepschi
ssp tenuirostris
258

Genus *CONTOPUS* Cabanis, 1855

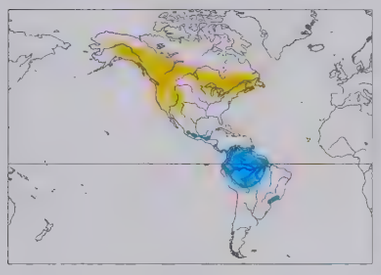
243. Olive-sided Flycatcher

Contopus cooperi

French: Moucherolle à côtés olive **German**: Olivflanken-Schnäppertyrann **Spanish**: Pibí Boreal

Taxonomy. *Muscicapa cooperi* Nuttall, 1831, latitude 54° N, banks of the River Saskatchewan, Canada. Formerly placed in a monotypic genus, *Nuttallornis*; also, previously referred to as *C. borealis*, but that name preceded by present one. Closest relatives possibly *C. fumigatus*, *C. sordidulus* and *C. virens*. Larger birds in SW (S California, N Baja California) sometimes treated as a geographical race, *marjorinus*. Monotypic.

Distribution. Breeds from N & W Alaska E across C Canada to Maritime Provinces, and S in USA to N California, also locally into NW Mexico (Baja California), in interior through Idaho and W Montana to NE Arizona and NW New Mexico and, in E, to boreal regions of Adirondacks and New England. Winters locally in W & S Mexico (from Jalisco and S Veracruz) S to Panama and (mainly in mountainous regions) from Colombia and Venezuela S to SE Peru and NW Bolivia; more locally in the Guianas, S Amazonia (from lower R Amazon S to C Bolivia and Tapajós basin) and SE Brazil.



Descriptive notes. 18-20 cm; 32-37 g. Stout, large-headed, short-tailed flycatcher with peaked crest. Has head and upperparts drab brownish or grey-olive, wings dusky, indistinct dull greyish wingbars, whitish edging on inner secondaries and tertials; long primary projection; tail dusky; white below, duller on belly, with sides and flanks contrastingly streaked dusky olive (distinct vested appearance), undertail-coverts with dull brownish-grey feather centres; white tuft on flanks occasionally visible above wings; iris dark; bill broad, upper mandible black, lower mandible pale orange with dark tip; legs blackish. Sexes similar. Juvenile is similar to adult, but browner overall, buff wash on wingbars and margins of tertials. Voice. Song, mainly by male on breeding grounds, a sharp and penetrating loud 3-note whistle, "whit, whee-pew" or "whip wéédéér" ("quick, three beers"); song of Pacific birds reported as slightly different, "what peeves yoou" with no syllable emphasized. Call 3 evenly spaced hard notes, "pip, pip, pip" or "bik-bik-bik", by both sexes throughout year. Other vocalizations include song-call combination, "peer-pip", by male; twittering "pip"-like notes by both sexes near nest, in greeting or on landing after prey capture; squeaky "eek" sometimes during attack-flights against predators. Nestling begging call "cheep-cheep", reminiscent of call of Pine Siskin (*Carduelis pinus*). Bill-snapping during aggressive encounters.

Habitat. Breeds in montane and coniferous forests, forest openings, edges, burned areas, borders of streams, bogs and other wetlands with prominent snags; habitat includes Douglas fir (*Pseudotsuga menziesii*), grand, red and balsam firs (*Abies grandis*, *A. magnifica*, *A. balsamea*), western red cedar (*Thuja plicata*), western and eastern hemlocks (*Tsuga heterophylla*, *T. canadensis*), various pines (*Pinus contorta*, *P. ponderosa*, *P. banksiana*, *P. rigida*), red, white and black spruces (*Picea ribens*, *P. glauca*, *P. mariana*), tamarack (*Larix laricina*), aspen (*Populus*). Mainly montane habitats during migration, but also riparian forests in W USA and pine-oak (*Pinus-Quercus*) forest and evergreen and semi-deciduous forests in Central America. Winters in forest edges, forest openings and second growth where snags present. Breeds sea-level to 3350 m; winters 400-3400 m.

Food and Feeding. Insects, including hymenopterans, dipterans, lepidopterans, orthopterans, Odonata, and coleopterans (Scolytidae). Searches for prey while sitting upright on high exposed perch; in Venezuela, can be found on same perch for weeks. Prey captured by sallying, often returning to same perch.

Breeding. Late May to Aug. Cup-nest built by female, of twigs and rootlets, often lined with *Usnea* beard lichen, grass and pine needles, average outside diameter 11·8 cm, inside 7 cm (Oregon), outside diameter 13·4 cm, inside 6·1 cm (Alaska); generally placed towards tip of horizontal branch in conifer, although other trees sometimes used. Clutch 2-5 eggs, usually 3-4; renesting may occur if first nest fails; incubation period 14-19 days; fledging period usually 15-23 days. Success: 62% of pairs in Alaska and 65% of pairs in NW Oregon successfully fledge more than 1 young. Longevity record at least 7 years.

Movements. Long-distance migrant, wintering in Central and South America; longest migration route of any North American tyrannid. Nocturnal migrant. Most migrate through W USA and Central America, occurring more locally on passage in E and occasionally along coastal SE Atlantic and Gulf coast states. Departs breeding grounds early Aug to early Sept, passing through Mexico Aug to early Nov; arrival in Costa Rica and Panama mid-Sept to mid-Nov, in South America in Oct-Nov. Greatest winter abundances in Colombia. Leaves wintering grounds late Mar/Apr, rarely as late as mid-May, passing through Mexico Apr to early Jun, arriving on breeding grounds from Apr to late May. Migration routes through forests of W North America and Central America, routes (and habitat use) may vary between spring and autumn migrations. Vagrants recorded from Bering Sea islands, Greenland, Bermuda, SE Brazil and coastal S Peru.

Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Global population estimated at 1,200,000 individuals. Survey data show overall decline of 67% across breeding range from 1966 to 1996, declines accelerating in later half of this period, especially in core areas W of Rocky Mts. Factors limiting population unknown, but habitat loss, particularly deforestation on wintering grounds in Andean foothills, suspected; considered uncommon and declining in South America. This genus has lowest reproductive rate of all passerine genera in North America, thereby increasing the importance of winter survival to general demographic trends. In breeding range, fire suppression may also reduce suitable habitat, as this species may have been historically dependent on post-fire habitats; acid rain threatens forest habitat in S Appalachians. Listed by US Fish & Wildlife Service as a species of concern; listed as "endangered" in Maryland. North American Landbird Conservation Plan considers this to be a "Watch List" species, with a goal of increasing its population size by 100%.

Bibliography. Alcorn (1988), Altman (1999), Altman & Sallabanks (2000), Anon. (1995c, 1998a), Armstrong (1983), Baicich & Harrison (1997), Bangs & Penard (1921), Beal (1912), Beedy (1981), Bent (1942), Binford (1989), Blake & Loiselle (1992a), Bock & Lynch (1970), Burleigh (1972), Campbell *et al.* (1997), Carter *et al.* (1996), Cheskey (1987), Cyr & Larivée (1995), Davis (1976), DeGraaf & Rappole (1995), Diamond (1991), Dixon (1920), Duncan (1988), Eckhardt (1979), Erskine (1977), Evans & Finch (1994), Fjeldså & Krabbe (1990), Finch (1992), Fitzpatrick (1978, 1980a), Forbush (1927), Gilligan *et al.* (1994), Godfrey (1986), Gómez & Aguilar (1998), Granholm (1982), Grinnell (1928), Griscom & Snyder (1955), Haverschmidt & Mees (1994), Hejl & Paige (1994), Hejl *et al.* (1995), Hilty (1980, 2003), Hilty & Brown (1986), Howell & Webb (1995a), Hutto (1980, 1995a, 1995b), Johnsgard (1979), Kaufman (1996), Kessel & Gibson (1978), LeGrand & Hall (1989), Ligon (1961), Lowe *et al.* (1978), Mayr & Short (1970), Meehan & George (2003), Meyer de Schauensee & Phelps (1978), Miller (1963), Murphy (1989), Oberholser (1974), Otvos & Stark (1985), Paynter (1995), Pearson (1936), Peck & James (1987, 1997), Peterjohn (1989), Peterjohn *et al.* (1995), Petersen (1988a), Peterson & Fichtel (1992), Pfister (1980), Phillips (1936), Price *et al.* (1995), Pyle (1997a), Raphael *et al.* (1987), Rappole & Warner (1980), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins, S.D. (1991), Robbins, C.S., Fitzpatrick & Hamel (1992), Robertson & Woolfenden (1992), Robinson, J.C. (1990), Robinson, S.K., Fitzpatrick & Terborgh (1995), Robinson, S.K., Terborgh & Fitzpatrick (1988), Sauer & Droege (1992), Sauer *et al.* (1997), Scott & Crouch (1988), Scott *et al.* (1982), Sibley (2000), Sick (1993, 1997), Sherry (1984), Slud (1964), Small (1994), Stevens *et al.* (1977), Stiles (1980, 1994), Stiles & Skutch (1989), Stotz, Bierregaard *et al.* (1992), Stotz, Fitzpatrick *et al.* (1996), Thurber *et al.* (1987), Todd (1963), Tufts (1986), Veit & Petersen (1993), Verner (1980), Wetmore (1972), Willis (1980), Willis *et al.* (1993), Wright (1997), Zimmer (1939b), Zink & Johnson (1984).

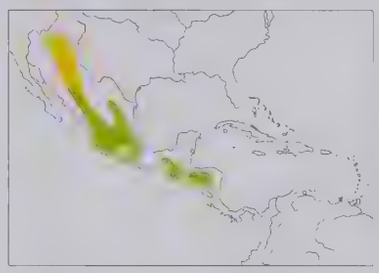
244. Greater Pewee

Contopus pertinax

French: Moucherolle de Coues **German**: Großer Schnäppertyrann **Spanish**: Pibí Tengofrío
Other common names: Coues's Flycatcher

Taxonomy. *C[ontopus] pertinax* Cabanis and Heine, 1859, Jalapa, Veracruz, Mexico.
Formerly placed in genus *Myiochanes*. May form a superspecies with *C. lugubris* and *C. fumigatus*, and formerly treated as a race of latter. Geographical plumage variation slight and clinal, and populations also differ in voice; further study needed. Pale-bellied birds from N of range sometimes separated as race *pallidiventris*, but better merged with nominate. Two subspecies recognized.

Subspecies and Distribution.
C. p. pertinax Cabanis & Heine, 1859 - breeds SW USA (C & SW Arizona, SW New Mexico) and W & C Mexico (S to Isthmus of Tehuantepec); winters S to Guatemala and Belize.
C. p. minor (W. deW. Miller & Griscom, 1925) - S Mexico (mainly E of Isthmus of Tehuantepec), Guatemala and Belize S to NC Nicaragua.



Descriptive notes. 17-19 cm; 27 g. Has indistinct pale supraloral area and dark lores; crown dark grey to greyish-olive, tufted; rest of head and nape and upperparts drab grey to greyish-olive; wings and tail dusky, pale tips of median and greater wing-coverts (two faint wingbars), whitish to pale brown margins of secondaries and tertials; pale grey below, belly tinged yellow; iris dark; upper mandible black, lower mandible yellow-orange; legs blackish. Differs from *C. cooperi* in longer tail, tufted crest, greyer overall coloration, brighter lower mandible. Sexes similar, female tail and wing lengths on average shorter than male's. Juvenile is similar to adult, but wingbars cinnamon-buff, margins of secondaries pale yellow-buff, belly and undertail-coverts tinged pale buff or pale ochre. Resident race *minor* has shorter wings and tail than migratory nominate, is also smaller and darker. Voice. Call "pip-pip-pip" or "beek beek beek", similar to that of congeners; call of race *minor* described as loud "quip-quip" or "wic-wic-wic". Male song a plaintive "wheee tee whee-wheu" or "Ho-say ma-ree-ah", sometimes preceded by extra "ho-say" notes or followed by short "whee di-irit" or "chewdl-it" phrases. Dawn song (*minor*) "fred-rick-fear", middle note ascending in pitch, "fear" lower, similar to *C. lugubris*.

Habitat. Breeds in pine (*Pinus*) and pine-oak (*Pinus-Quercus*) woodland in mountains; some use riparian and broadleaf forest in winter. In general, occurs at 750-3500 m, descending locally to 250 m in winter; 2100-3000 m in N of range, 1360-2575 m in S Mexico (Oaxaca), 1060-1500 m in El Salvador; down to 400 m in Belize.

Food and Feeding. Insects during breeding season; some fruit in winter. Forages in erect stance from exposed perch (e.g. end of dead branch, top of pine); mean perch height (Arizona) 18 m, intermediate between higher-perching *C. cooperi* and lower-perching *C. sordidulus*. Captures prey by sallying from perch greater than 16 m, returning to same perch; also moves between foraging perches often several hundred metres apart. In autumn, single individuals reported within mixed-species flocks passing through the bird's territory.

Breeding. May-Jul; pair-forming in Mar in El Salvador. Cup-nest made of grass, bark, pine needles, pine cones, oak catkins and contour feathers, outside covered with lichens and spiders' web, external diameter 10·2-13·5 cm, height 5·1-8 cm, internal diameter 7·6 cm, depth 2·5-5 cm; placed near tip of large branch, often within fork, on average 11·62 m high in Huachuca Mts (Arizona). Clutch 2-4 eggs; no information on incubation and fledging periods; vigorously attacks potential nest predators. In SE Arizona, 53% of females rear at least one brood to fledging.

Movements. Partial short-distance migrant. N populations migrate S in winter; leave SE Arizona breeding grounds by end Sept; return as early as late Mar, via mountainous routes at 1500 m. Some Mexican individuals winter in breeding habitat, others move downslope to riparian areas; Sonora birds move to lower elevations in late Aug. No seasonal altitudinal movements in Belize, El Salvador and Honduras.

Status and Conservation. Not globally threatened. Common to fairly common. Global population estimated at 2,000,000 individuals. Densities in mountains of SE Arizona low, 0·05-0·17 birds/ha; more abundant in Sierra Madre of N Sonora, in Mexico. Protection of pine-oak forest for breeding Spotted Owl (*Strix occidentalis*) and Northern Goshawk (*Accipiter gentilis*) should also benefit this tyrannid.

Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bent (1942), Binford (1989), Blake, E.R. (1953), Chace & Tweit (1999), Cory & Hellmayr (1927), Dearborn (1907), DeGraaf & Rappole (1995), Fitzpatrick (1980a), Fleming & Baker (1963), Howell & Webb (1995a), Hutto (1980, 1992), Kaufman (1996), Land (1970), Lee Jones (2004), Monroe (1968), Price *et al.* (1995), Ridgway (1907), Rowley (1966), Schaldach (1963), Smithe (1966), Stotz *et al.* (1996), Udvardy (1963), Wetmore (1941).

245. Dark Pewee

Contopus lugubris

French: Moucherolle ombré **German**: Trauerschnäppertyrann **Spanish**: Pibí Oscuro

On following pages: 246. Smoke-coloured Pewee (*Contopus fumigatus*); 247. Ochraceous Pewee (*Contopus ochraceus*); 248. Western Wood-pewee (*Contopus sordidulus*); 249. Eastern Wood-pewee (*Contopus virens*); 250. Tropical Pewee (*Contopus cinereus*); 251. Cuban Pewee (*Contopus caribaeus*); 252. Jamaican Pewee (*Contopus pallidus*); 253. Hispaniolan Pewee (*Contopus hispaniolensis*); 254. Lesser Antillean Pewee (*Contopus latirostris*); 255. White-throated Pewee (*Contopus albogularis*); 256. Blackish Pewee (*Contopus nigrescens*); 257. Tufted Flycatcher (*Mitrephanes phaeocercus*); 258. Olive Flycatcher (*Mitrephanes olivaceus*).

Taxonomy. *Contopus lugubris* Lawrence, 1865, Barranca, Costa Rica.
Closely related to *C. pertinax* and *C. fumigatus*; formerly considered a race of latter. Monotypic.
Distribution. Mountains of Costa Rica and extreme W Panama.



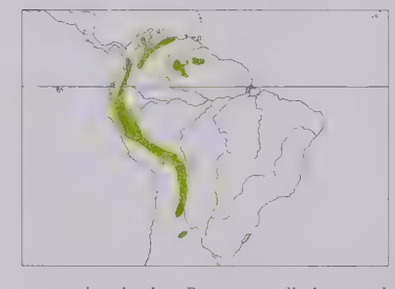
Descriptive notes. 16·5 cm; 23 g. Large, crested pewee. Has head and upperparts uniform dark sooty olive-grey, darkest on crown; wings and tail blackish, wing-coverts faintly tipped grey (wingbars), grey margins of secondaries and tertials; fairly uniform dull grey below, throat perhaps slightly paler, belly tinged buff, undertail-coverts grey with buff edges; iris dark; bill broad, upper mandible black, lower mandible orange-yellow; legs blackish. Differs from *C. cooperi* in longer tail, more obvious crest, much more uniform coloration. Sexes similar. Juvenile resembles adult, but browner on upperparts, throat and breast, rufous feather fringes on rump and uppertail-coverts, paler buffy white on belly. Voice. Frequently repeated call a loud "wic", "whip" or "pip pip pip"; also loud "weer". Dawn song, from treetop during breeding, "fred-rick-fear", middle note ascending, and "fear" part lower.
Habitat. Humid montane forest, forest borders and clearings with scattered trees; 1200-2150 m in Costa Rica, 900-2250 m in Panama.
Food and Feeding. Insects. Searches for prey from high perch, often exposed dead branch or top of tree, stance upright; captures prey with long sallies, often returning to same perch afterwards; vibrates tail upon landing.
Breeding. Mar-Jun. Nest a broad shallow cup made of green moss, liverworts and lichens, bound by spiderweb, lined with rootlets and coarse plant fibres, placed 5-18 m up, saddled over descending branch; mobs Emerald Toucanets (*Aulacorhynchus prasinus*) during nesting season. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Costa Rica and Panama Highlands EBA. Uncommon to fairly common. Highland forests in species' range have been extensively destroyed by burning, logging and agricultural conversion. In Costa Rica, 50% of forests destroyed since 1940, and current deforestation rate of c. 3% annually means that soon forests will survive only in protected areas.
Bibliography. Anon. (1998a), Blake (1958), Chace & Tweit (1999), Cory & Hellmayr (1927), Delgado (1985), Eisenmann (1955), Ridgely & Gwynne (1989), Ridgway (1907), Skutch (1967), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1972).

246. **Smoke-coloured Pewee**

Contopus fumigatus

French: Moucherolle bistré **German**: Schieferschnäppertyrann **Spanish**: Pibí Ahumado

Taxonomy. *T[yrannus] fumigatus* d'Orbigny and Lafresnaye, 1837, Yungas of Bolivia.
Formerly considered conspecific with *C. pertinax* and *C. lugubris*. Race *ardosiacus* thought by some authors to be possibly a separate species; further study required. Validity of some other races questionable. Six subspecies recognized.
Subspecies and Distribution.
C. f. ardosiacus (Lafresnaye, 1844) - Colombia (except SW), extreme W & SW Venezuela, E Ecuador and E Peru.
C. f. cineraceus (Lafresnaye, 1848) - N Venezuela.
C. f. duidae (Chapman, 1929) - S Venezuela and Guyana.
C. f. zarumae (Chapman, 1924) - SW Colombia and W Ecuador to NW Peru.
C. f. fumigatus (d'Orbigny & Lafresnaye, 1837) - SE Peru and N Bolivia.
C. f. brachyrhynchus Cabanis, 1883 - SE Bolivia S to NW Argentina.



Descriptive notes. 16-17 cm; 18·2 g. Nominate race has dark grey crown with crest, indistinct paler supraloral stripe; upperparts fairly uniform grey, sometimes tinged olive, rump sooty grey; wings duskier, pale brown tips of wing-coverts (two narrow indistinct wingbars) and edges of tertials; tail dusky; grey below, throat slightly paler, lower belly and undertail-coverts yellowish-white; iris dark; upper mandible black, lower mandible orange-yellow; legs black. Sexes similar. Juvenile is more brownish overall than adult, feathers of upperparts (especially nape) fringed buff, 2-3 narrow ochre wingbars, belly and undertail-coverts tinged ochre. Races generally become darker and greyer towards N: *brachyrhynchus* is paler overall than nominate, greyer crown contrasts less with back, has much paler whitish throat, more extensive pale area on belly; *duidae* is smaller, darker bluish-grey overall, wings more blackish than nominate, throat and underparts all dark smoky grey, but juvenile has whitish on lower belly; *ardosiacus* has more uniform grey underparts, lower belly and undertail-coverts grey, paler than breast (but not white); *cineraceus* and *zarumae* are very like nominate. Voice. Most frequent call a loud "pip pip pip"; also repeated clear whistled "peeew". Rarely heard song a hoarse "zur zur zur zúr zur zur zur" (Andes). Dawn song in N Venezuela (race *cineraceus*) a whistled "whueer", "whueer, whu-u'whuet", "whueer, wheerit" or "peer-peereét", reminiscent of *C. cooperi* song; in Argentina (*brachyrhynchus*) a more subdued "per-wheer", reminiscent of a *Spizaetus* hawk-eagle. Also gives single "rrhy" and short "pjeek" or "pjeek pjeek" notes.
Habitat. Humid montane forest, forest borders and clearings with scattered trees. Usually at 1000-2500 m, sometimes to 3000 m in Andes, locally down to near sea-level in SW Ecuador; in Venezuela, 500-2800 m N of R Orinoco and 900-1900 m S of it.
Food and Feeding. Insects. Searches for prey from low to high perch, often exposed dead branch, top of tree, or lower fallen tree; perches erect. Captures prey in long aerial sallies, often returning to same perch afterwards; vibrates tail upon landing.
Breeding. Cup-nest made of moss and lichen, saddled on horizontal branch high in tree. No other information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Fairly common to common. Has relatively large range and is tolerant of disturbed habitat. Occurs in many national parks and other protected areas throughout range, including almost every protected reserve in its Andean range.
Bibliography. Anon. (1998a), Baez *et al.* (1997), Canevari *et al.* (1991), Chapman (1917c, 1931), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Di Giacomo & López (1998), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Hilty (1997, 2003), Hilty & Brown (1986), Mayr & Phelps (1967), Meyer de Schauensee (1982), Miller (1963), Nores *et al.* (1983), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Walker (2001), Wetmore (1939), Williams & Tobias (1994), Zimmer (1930, 1939a).

247. **Ochraceous Pewee**

Contopus ochraceus

French: Moucherolle ocré **German**: Ockergelb-Schnäppertyrann **Spanish**: Pibí Ocráceo

Taxonomy. *Contopus ochraceus* P. L. Sclater and Salvin, 1869, Costa Rica. Monotypic.
Distribution. Highlands of Costa Rica, rarely also extreme W Panama (Chiriquí).



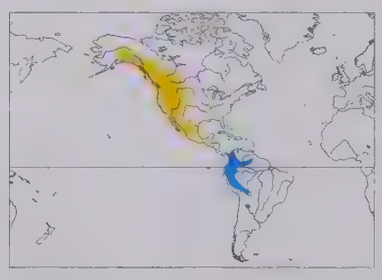
Descriptive notes. 16·5 cm; 23 g. Large, crested pewee. Has crown and crest dark brownish-olive, head side, nape and upperparts olive; wings blackish, two olive-buff, buff or ochre wingbars; tail dusky, notched; throat pale yellow, breast and flanks olive with ochre tinge or wash, belly and undertail-coverts buffy yellow; plumage paler and duller overall when worn; iris dark; bill broad, upper mandible black, lower mandible orange-yellow; legs blackish. Sexes similar. Juvenile is similar to adult, but wingbars brighter ochre, margins of lesser coverts edged ochre-buff. Voice. Call a sharp and repeated "pwit", shriller than call of *Empidonax atriceps*; also a typical "pip pip pip" call. Song a piercing high, thin "peeeeyit" or "peeeeyeeet", first syllable accented.
Habitat. Broken canopy of montane oak (*Quercus*) forest or tall second growth, especially near streams, treefall gaps and forest borders; 2200-3000 m.
Food and Feeding. Insects, including hymenopterans, dipterans, lepidopterans, coleopterans. Usually solitary, sometimes with mixed flocks. Searches for prey from exposed perch 6-12 m up, usually at forest edge; upright posture. Captures prey in short aerial sallies, often returning to same perch; frequently shivers tail upon alighting.
Breeding. Mar. Nest a bulky cup constructed primarily of moss, saddled on slender horizontal limb high in canopy near forest edge. No other information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Costa Rica and Panama Highlands EBA. Uncommon to rare, and local. More or less confined to the Irazú-Turrialba massif of Cordillera Central and Cordillera de Talamanca, in Costa Rica; very few records from Panama. Highland forests in this species' range have been extensively destroyed by burning, logging and agricultural conversion; 50% of Costa Rica's forests have been lost since 1940, and current deforestation rate of c. 3% annually means that forests will soon survive only in protected areas.
Bibliography. Anon. (1998a), Collar *et al.* (1994), Cory & Hellmayr (1927), Delgado (1985), Eisenmann (1955), Ridgely & Gwynne (1989), Ridgway (1907), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1972).

248. **Western Wood-pewee**

Contopus sordidulus

French: Pioui de l'Ouest **German**: Westlicher Waldschnäppertyrann **Spanish**: Pibí Occidental
Other common names: Western Pewee

Taxonomy. *Contopus sordidulus* P. L. Sclater, 1859, Orizaba, Mexico.
Thought by some possibly to form a superspecies with *C. virens* and *C. cinereus*; has been considered conspecific with former. Geographical variation subtle, size increasing to N, colour becoming richer in moist environments such as Pacific NW. Proposed races *siccicola* (described from Idaho, USA) and *amplus* (Montana, USA) merged with *veliei*, and *griscomi* (Guerrero, in Mexico) with nominate. Four subspecies recognized.
Subspecies and Distribution.
C. s. saturatus Bishop, 1900 - breeds SE Alaska and NW & W Canada S in USA to W Oregon; winters N South America (probably mainly Colombia and Venezuela).
C. s. veliei Coues, 1866 - breeds E Alaska S through interior mainly to N Mexico, E in USA to N & W Great Plains states and S to W Texas; winters probably South America (S possibly to Peru, Bolivia and N Argentina).
C. s. peninsulae Brewster, 1891 - breeds W Mexico (S Baja California); winters probably NW South America.
C. s. sordidulus P. L. Sclater, 1859 - breeds highlands of Mexico S at least to Honduras, possibly to NC Nicaragua and Costa Rica; winters S to Colombia, Ecuador and Peru.



Descriptive notes. 14-16 cm; 12-14 g. Nominate race has peaked crown dark greyish-brown, faint paler lores, indistinct thin eyering (sometimes lacking); head side, nape and upperparts uniform greyish-brown; wings dusky, greyish tips on wing-coverts (two indistinct narrow wingbars), greyish margins on secondaries and tertials; long primary projection; tail dusky; throat pale grey to whitish, breast and flanks dull grey (darker "vest"), belly paler, tinged yellow, undertail-coverts whitish with darker grey-brown centres; underwing-coverts greyish; iris dark brown; upper mandible black, lower mandible black with pale orange at base or all dark; legs blackish. Distinguished with difficulty from *C. virens* by on average darker and browner plumage, darker underwing and undertail-coverts, less pale colour at base of lower mandible. Sexes similar, female slightly smaller than male. Juvenile resembles adult, but browner above, slightly darker below, wingbars broader and buffy. Race *saturatus* is darker and more olive above than nominate, blackish on crown, yellower on throat and belly; *veliei* is greyer, with little or no yellow tinge below; *peninsulae* is paler, with narrow grey breastband, broader margins on remiges, shorter wing and tail, longer bill. Voice. Song, typically by territorial male, a harsh burry and descending "pee-er", "phreeer", "peweer" or "brreeu", sometimes followed by rapid rolled "chu-i-lit". Male dawn song "tswee tee

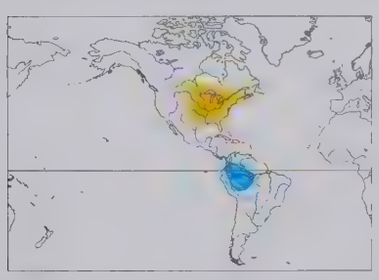
teet" or "pee-pip-pip-pip" alternated with "pee-er" songs. Also a "bzew" call, perhaps only at night; infrequent "chip" or "pip" by both sexes when alarmed, and rapid twitter call.
Habitat. Variety of semi-open deciduous, coniferous and mixed woodland habitats, forest edge and riparian vegetation; breeds in pine-oak (*Pinus-Quercus*) and pine forests and other semi-open woodlands in Mexico. During migration, also in treeless desert. Winters in mature and secondary tropical forest, montane forest and forest borders. Sea-level to at least 3000 m; 500-3000 m in Mexico; in non-breeding range to 1000 m in Venezuela, and recorded at 2600 m in Colombia (Bogotá savanna).
Food and Feeding. Insects, rarely also spiders; fruit taken rarely. Insects include dipterans, hymenopterans, coleopterans, lepidopterans (adults, rarely caterpillars), damselflies and dragonflies (Odonata), mayflies (Ephemeroptera), neuropterans, termites (Isoptera), bugs (Hemiptera); average prey length 6·9 mm. Searches for prey from dead branch or other exposed perch high in canopy, near small opening in forest; perches upright. Makes short or long sallies to hawk insects from air or glean prey from foliage or ground, returning to same or nearby perch; quivers wings upon landing.
Breeding. Early May to late Aug. Compact nest cup made of woven grass, plant fibres, bark, plant down, feathers, animal hair, moss, insect puparia and bud scales, bound together by spiderweb, lined with fine grass and animal hair, average external diameter 8·5 cm, height 6·6 cm, internal diameter 4·8 cm, depth 3·4 cm; saddled in fork of horizontal branch near ground to more than 25 m up, nest trees include various Populus species (e.g. *P. fremontii*, *P. trichocarpa*, *P. tremuloides*), black walnut (*Juglans nigra*), sycamore (*Platanus racemosa*), *Ailanthus altissima*, willow (*Salix*), valley oak (*Quercus lobata*). Clutch 2-4 eggs, usually 3; incubation period 14-15 days; fledging period 14-18 days, usually 16 days. Average success variable; in USA, 82% of nests in ponderosa pine (*Pinus ponderosa*) and riparian forest in Colorado fledged more than one young, compared with 46% in riparian forest in N California. Probably capable of breeding at 1 year. Longevity record 6 years 1 month.
Movements. Medium-distance to long-distance migrant, wintering in South America. Departs breeding grounds mainly Aug-Sept, passing through Costa Rica late Jul to mid-Nov; leaves wintering grounds in Ecuador as late as Mar, passes N through Venezuela Feb-Apr, through Costa Rica late Mar to late May; arrives on breeding grounds in Mexico mid-Mar to early Jun, in S USA (Texas) by mid-Apr to late May. Vagrants recorded in E half of USA, also from Cuba and Jamaica.
Status and Conservation. Not globally threatened. Fairly common to uncommon. Global population estimated at 9,700,000 individuals. Survey data for Canada and USA show that this species decreased by 1·5% annually between 1966 and 1994, with highest decreases in British Columbia, California, Oregon, Arizona and New Mexico; declines possibly due to destruction of riparian habitats by grazing, agriculture and urbanization; loss and alteration of wooded habitats in non-breeding range (e.g. Andean foothill forests) may also have a negative effect. In view of the species' use of edge and semi-open habitats, however, reasons for the overall decline remain unclear. May benefit in some areas from forest fragmentation; numbers increased in places where forest opened up by fires, management or natural tree diseases.
Bibliography. Anon. (1998a), Arendt (1992), Armstrong (1983), Baicich & Harrison (1997), Beal (1912), Beaver & Baldwin (1975), Bemis (1996), Bemis & Rising (1999), Bent (1942), Binford (1989), Campbell *et al.* (1997), Chace *et al.* (1997), Clapp *et al.* (1983), Cory & Hellmayr (1927), Curson *et al.* (1996), DeGraaf & Rappole (1995), Fitzpatrick (1980a, 1980c), Fjeldså & Krabbe (1990), Gómez & Aguilar (1998), Harrison, C. (1984), Harrison, H.H. (1979), Hilty (2003), Howell & Webb (1995a), Hutto (1980), Johnsgard (1979), Kaufman (1996), Otvos & Stark (1985), Paynter (1995), Price *et al.* (1995), Pyle (1997b), Ridgely & Tudor (1994), Ridgway (1907), Sauer & Droege (1992), Small (1994), Stiles & Skutch (1989), Stotz *et al.* (1996), Terres (1980), Udvardy (1963), Wiedenfeld *et al.* (1992).

249. **Eastern Wood-pewee**

Contopus virens

French: Pioui de l'Est **German**: Östlicher Waldschnäppertyrann **Spanish**: Pibí Oriental

Taxonomy. [*Muscicapa*] *virens* Linnaeus, 1766, Carolina, USA.
Thought by some possibly to form a superspecies with *C. sordidulus* and *C. cinereus*; has been considered conspecific with former. Monotypic.
Distribution. Breeds SE Canada (Saskatchewan E to Maritime Provinces) and S in USA to SC Texas, Gulf Coast states and C Florida. Winters mainly from Colombia and Venezuela S to N Bolivia and W Brazil, casually as far N as Costa Rica.



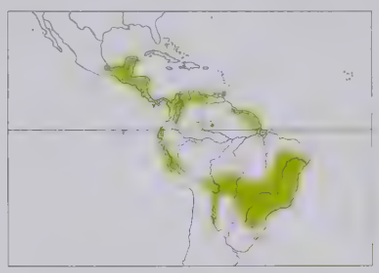
Descriptive notes. 13·5-15 cm; 14g. Has peaked crown dark greyish-brown to greyish-olive, faintly paler lores, indistinct thin eyering (sometimes absent); head sides, nape and upperparts uniform greyish-brown or greyish-olive; wings and tail dusky, pale grey tips of wing-coverts (two distinct narrow wingbars), greyish margins of secondaries and tertials; long primary projection; throat pale grey to whitish in centre, breast and flanks dull grey (forming darker "vest"), belly yellow-tinged whitish, undertail-coverts whitish with pale grey centres, sometimes tinged yellow; underwing-coverts whitish; iris dark brown; upper mandible black, lower mandible pale orange with dark tip; legs blackish. Distinguished with difficulty from *C. sordidulus* by being on average slightly more olive above, paler below, especially on throat and belly, paler underwing-coverts, more extensive pale orange on lower mandible. Sexes similar, female slightly smaller than male. Juvenile has browner upperparts than adult, broader buffy wingbars, slightly darker below. VOICE. Song, by male, consists of slurred "pee-ah-wee", second note lower, and alternating "peeeur", "wee-oo" or "wee-ur", often in different combinations; sometimes followed by rapid rolled "hew-di-lit". Dawn song similar, with "ah di dee" added. Also short "chip", twittering flight songs, and shrill "pe-e-e-e-e" when disturbed.
Habitat. Breeds in variety of coniferous and deciduous forest habitats, often near clearings or edges; often near riparian areas in Midwest USA, less frequently near streams in E. Variety of forest and successional habitats during migration, including scrub in Yucatán Peninsula, cloudforest in S Mexico (Chiapas), dry to moist forest in Panama. Winters in forested habitats, including gallery forest, secondary growth, shrubby areas; in Peru, in successional forest, treefall gaps, edges of flooded forest, *Cecropia* and young *Ficus* stands; in gallery forest with many wild cashews (*Anacardium*) in Venezuela. Sea-level to 1500 m, but on passage up to 2850 m in Colombia; usually winters below 1300 m.
Food and Feeding. Insects less than 15 mm long, including dipterans, homopteran bugs, lepidopterans, hymenopterans, coleopterans; rarely, fruit. Searches for prey from dead branch or other perch in subcanopy or canopy; perches upright. Sallies to hawk insects from air or to glean prey from foliage or ground, then continuing on to new perch, occasionally returning to original perch.
Breeding. May-Sept. Nest a shallow woven cup of grass, bark strips, twigs, roots, moss, pine needles and leaves, outside covered with lichen, lined with animal hair, grass, moss, lichen and plant fibres, average external diameter 7·5-8·5 cm, height 3-4·5 cm, internal diameter 4·5-5 cm, depth 1·5-3 cm; placed 5-20 m up on outer horizontal branch. Clutch 2-4 eggs, usually 3; incubation probably 12-13 days; fledging probably 16-18 days. Breeds at 1 year. Longevity record greater than 7 years.
Movements. Long-distance migrant, wintering in South America. Migrates at night. Departs breeding grounds mid-Aug to Sept, passing through Mexico Aug-Nov; some cross Caribbean. Leaves wintering areas Apr, migrating via similar routes as in autumn (or perhaps on more W route through Mexico), passing through Mexico late Mar to early Jun; arrival in extreme S USA first half Apr, in most of breeding range by mid-May. Vagrants recorded in W USA, Barbados, Bermuda, and NE Canada.
Status and Conservation. Not globally threatened. Fairly common to common; common over much of breeding range. Global population estimated at 6,000,000 individuals. Locally common migrant in Venezuela. Survey data indicate significant population decline of 35·6% between 1965 and 1993 (13·4% from 1984 to 1993), although increases noted in some areas; declines stronger in C USA than in E. Loss and alteration of wooded habitats in both breeding and wintering ranges may have a negative effect; nevertheless, given the species' use of edge and semi-open habitats, and apparent tolerance of forest fragmentation, reasons for the overall decline remain unclear; heavy browsing by artificially high numbers of white-tailed deer (*Odocoileus virginianus*) implicated in an experimental study.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bendire (1895), Bent (1942), Burns (1915), Clapp *et al.* (1983), Cory & Hellmayr (1927), Cyr & Larivée (1995), DeGraaf & Rappole (1995), Fjeldså & Krabbe (1990), Fitzpatrick (1980a), Gómez & Aguilar (1998), Hilty (2003), Howell & Webb (1995a), Johnsgard (1979), Kaufman (1996), Knight (1908), McCarty (1996b), Paynter (1995), Peck & James (1987, 1997), Price *et al.* (1995), Pyle (1997b), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Sick (1993, 1997), Smith, W.J. (2001), Staicer *et al.* (1996), Stiles & Skutch (1989), Udvardy (1963), Wetmore (1972), Wiedenfeld *et al.* (1992).

250. **Tropical Pewee**

Contopus cinereus

French: Moucherolle cendré **Spanish**: Pibí Tropical
German: Südlicher Waldschnäppertyrann

Taxonomy. *Platyrhynchus cinereus* Spix, 1825, "in sylvis flum. Amazonum"; error = Rio de Janeiro, Brazil.
Thought by some possibly to form a superspecies with *C. sordidulus* and *C. virens*. Formerly included race *canescens* of *C. nigrescens*. Races possibly represent more than one species; nominate differs from others in plumage, and *punensis* differs vocally. Eight subspecies recognized.
Subspecies and Distribution.
C. c. brachytarsus (P. L. Sclater, 1859) - S Mexico (from N Oaxaca, S Veracruz and Yucatán, including Cozumel I) S to Panama (W of Darién Gap).
C. c. rhizophorus (Dwight & Griscom, 1924) - Guanacaste, in NW Costa Rica.
C. c. aithalodes Wetmore, 1957 - Coiba I, off S Panama.
C. c. bogotensis (Bonaparte, 1850) - N & E Colombia, N Venezuela, Trinidad and NW Brazil.
C. c. surinamensis F. P. Penard & A. P. Penard, 1910 - SE Venezuela, the Guianas and NE Brazil.
C. c. punensis Lawrence, 1869 - W Ecuador and W & C Peru.
C. c. pallescens (Hellmayr, 1927) - SC & E Brazil S to NE Paraguay, Bolivia and NW Argentina.
C. c. cinereus (Spix, 1825) - SE Paraguay, SE Brazil and NE Argentina.



Descriptive notes. 13-14·5 cm; 12-12·5 g. Nominate race has peaked crown with slight crest; is dark sooty grey above and below; two indistinct paler wingbars, grey throat, tiny area of white on central belly and undertail-coverts; iris dark; upper mandible black, lower mandible yellowish, rarely with dark tip; legs blackish. Sexes similar. Juvenile is browner above than adult, head and back feathers narrowly fringed whitish, wingbars and margins of remiges yellowish to bright buff, paler underparts. Races vary in plumage and size, nominate distinctive, others rather similar with paler lores, brownish-grey or olive-grey above, usually stronger wingbars, whitish throat sometimes tinged yellow, breast and sides washed grey or olive-grey, whitish belly and undertail-coverts sometimes tinged pale yellow: *aithalodes* has greyer throat, darker breastband, juvenile with buff feather fringes above; *brachytarsus* resembles previous, but darker on crown; *rhizophorus* is like last, but no olive tinge above, grey below with yellow tinge restricted to flanks; *surinamensis* is paler grey overall, crown contrasts little with back, juvenile with cinnamon fringes above; *pallescens* differs from previous in darker blackish-grey crown; *bogotensis* is slightly darker overall, also larger; *punensis* is darker, has more contrasting dark crown and darker grey back, is also larger and larger-billed than previous. VOICE. Calls vary geographically: in Venezuela and most of range a short trilled "seerip", "tre'e'e'e" or "tir'r'r'ip"; in E Brazil a more typical "pip-pip-pip" or "bit-bit-bit"; metallic "peet" or "fweet" in Costa Rica; trilled "ti-i-i-i-il" or "tree-ee-ee-eet" in Mexico. Song, too, may vary geographically: a repeated "tzee-zée" in Andes; upslurred "psee-eep" or "pee-eep" in Mexico; clear "pee, pidit" in W Ecuador; "wítjew" in E Brazil. Dawn song in Mexico upslurred "s-iep" or "w-iep", repeated every 2-3 seconds; in Costa Rica "wee tweet weet" interspersed with more musical "we-ye" notes.
Habitat. Borders of dry to moist forest, woodland, gallery forest, and plantations; shrubby clearings, dry bushy slopes with *Carica* and balsa trees, and locally mangroves. Sea-level to 1200 m in Mexico; up to 1500 m in much of South America, to 1900 m in Venezuela, occasionally to 2600 m in Andes.
Food and Feeding. Insects, including small hymenopterans, coleopterans, lepidopterans, dipterans. Searches from exposed perch at low to middle levels in open areas or along forest border; sallies for prey, often returning to same perch.
Breeding. Mar-Jun in Costa Rica, Mar and May-Jul in Trinidad; nests (two) found in Oct and Nov in Argentina. Male display involves squatting, jumping, and flicking of wings and tail, reminiscent of *Pipra* manakins. Nest a broad and neat shallow cup made of grey lichens, tendrils, seed down, weed stems and green moss, bound with spiderweb, placed 2-14 m up on exposed horizontal branch or upright fork in shrub or tree. Clutch 2-3 eggs; in Costa Rica, incubation by female, fed by male, period 15-16 days; no information on fledging period.
Movements. Mainly resident; migratory in extreme N and extreme S. In Mexico, most birds breeding from Chiapas to S Veracruz move S in winter, Sept-Feb; *pallescens* moves N during austral winter.
Status and Conservation. Not globally threatened. Uncommon to locally common. Occurs in many national parks and other protected areas throughout its large range. Adaptable; tolerant of converted and secondary habitats.
Bibliography. dos Anjos (1990), Anon. (1998a), Binford (1989), Brooks *et al.* (1993), Canevari *et al.* (1991), Clements & Shany (2001), ffrench (1991), Fjeldså & Krabbe (1990), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hilty (2003), Hilty & Brown (1986), Hinojosa *et al.* (1998), Howell & Webb (1995a), Lee Jones (2004), Lowen *et al.* (1996), Monroe (1968), Narosky & Salvador (1998), Olson (1997), de la Peña (1988), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994).

do Rosário (1996), Short (1975), Sick (1993, 1997), Skutch (1985), Slud (1964), Stiles & Skutch (1989), Stotz *et al.* (1996), Temple (2002), Tostain *et al.* (1992), Wetmore (1972), Williams & Tobias (1994), Zimmer (1930).

251. Cuban Pewee

Contopus caribaeus

French: Moucherolle tête-fou **German**: Kubaschnäppertyrann **Spanish**: Pibí Cubano
Other common names: Greater Antillean Pewee (if lumped with *C. pallidus* and *C. hispaniolensis*)

Taxonomy. *Muscipeta caribaea* d'Orbigny, 1839, Cuba.
Formerly treated as conspecific with *C. pallidus* and *C. hispaniolensis*. Four subspecies recognized.
Subspecies and Distribution.
C. c. bahamensis (H. Bryant, 1859) - Bahamas.
C. c. caribaeus (d'Orbigny, 1839) - Cuba and I of Pines.
C. c. morenoi Burleigh & Duvall, 1948 - mangroves on S coast of Cuba and nearby cays.
C. c. nerlyi Garrido, 1978 - Archipiélago de los Jardines de la Reina and nearby islands, off S Cuba.



Descriptive notes. 15-16·5 cm. Nominate race has dark olive-grey crown, tufted crest; slightly paler loral area, whitish crescent around rear of eye (extending to slight tip posteriorly); ear-coverts, nape and upperparts olive-brown; wings dusky brown, median and greater wing-coverts tipped pale brown to whitish-grey (two thin indistinct wingbars), outer secondaries and tertials edged whitish; short primary projection; tail dusky; throat pale grey, slightly tinged buff; breast beige-grey, washed olive on side of upper breast, belly and undertail-coverts more buffy mustard-yellow; iris dark; bill broad, flat, upper mandible black, lower mandible orange-yellow; legs black. Sexes similar. Juvenile resembles adult, but wingbars broader and buffy white, lower mandible paler. Race *bahamensis* is duller and greyer than nominate, paler above, less contrast between crown and back, paler below, only slight yellow tinge on belly; *nerlyi* is intermediate between previous and nominate, largely buffish below; *morenoi* resembles last. Voice. Generally rather vocal, often throughout day. Song a prolonged descending "weeeooooo". Call a repeated "weet" or "dee"; also softer "dep" or "vi-vi" note, reminiscent of *Myiarchus sagrae*. Dawn song (nominate race) a high squeaky whistle, "eeah, ooweeah", usually given sequentially; in Bahamas (*bahamensis*), a "dee-dee" phrase is added to the "eeah, ooweeah" series.
Habitat. Broadleaf and pine (*Pinus*) forests, forest edge, swamps, mangroves, brushy scrub, and tree plantations. Sea-level to 1800 m; rarer at high elevations.
Food and Feeding. Mainly insects; some fruit. Searches from low perch; sallies out to capture prey in the air (sometimes with loud snap of bill), often returning to same perch; shakes or flicks tail upon landing.
Breeding. Feb-Mar in Bahamas, Mar-Jun in Cuba. Nest a cup made of fine rootlets and hair, covered by lichen and moss, typically placed in fork of tree or shrub or on branch. Clutch 2-4 eggs; no other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Common. Widespread from coast to moderate elevations. Occurs in Güira National Park, in Cuba.
Bibliography. Anon. (1998a, 2002f), Barbour (1943), Bond (1985), Brudenell-Bruce (1975), Buden (1987b), Cory & Hellmayr (1927), Emlen (1977), Faaborg (1985), Garrido (1978), Garrido & Kirkconnell (2000), Gundlach (1873), Kirwan & Kirkconnell (2000), Raffaele *et al.* (1998, 2003), Reynard *et al.* (1993), Ridgway (1907), Socarrás (2001), Stotz *et al.* (1996), White (1998).

252. Jamaican Pewee

Contopus pallidus

French: Moucherolle de Jamaïque **German**: Jamaikaschnäppertyrann **Spanish**: Pibí Jamaicano
Other common names: Greater Antillean Pewee (if lumped with *C. caribaeus* and *C. hispaniolensis*)

Taxonomy. *Myiobius pallidus* Gosse, 1847, Jamaica.
Formerly treated as conspecific with *C. caribaeus* and *C. hispaniolensis*. Monotypic.
Distribution. Jamaica.



Descriptive notes. 15 cm. Has dark olive-brown head and upperparts, darkest on crown; wings dark brown, indistinct narrow buff wingbars (sometimes absent); long tail dusky brown, slightly notched; buff mixed with grey below, throat greyer, breast and sides washed with olive, undertail-coverts buffier; iris dark brown; bill broad, upper mandible black, lower mandible orange-yellow; legs blackish-brown. Sexes similar. Juvenile is greyer on underparts, paler chest, paler lower mandible, cinnamon wingbars. Voice. Call a plaintive "pee", rarely "pee-wee". Song a rising and then falling "oéeoh". Dawn song two alternating phrases, "paléet, weeléah".
Habitat. Forest, less often at edge, in openings beneath canopy. Mid-elevations to montane, to 2000 m.
Food and Feeding. Insects. Searches in erect posture from exposed perch 2-9 m up; makes long horizontal sallies to capture prey from the air, returning to same or new perch; flicks tail upon landing.
Breeding. Apr-Jun; possibly nests twice yearly. Nest a cup made of finely woven plant fibres, grass and Spanish moss (*Tillandsia*), placed in fork of tree. No other information.
Movements. Descends to lower elevations, and occasionally to lowlands, during non-breeding season.
Status and Conservation. Not globally threatened. Restricted-range species: present in Jamaica EBA. Common and widespread. In Jamaica, 75% of original forest cover already cleared, and remaining forest largely second growth. Undisturbed forest survives only on high steep mountain slopes, some of which protected in the Blue Mountain and John Crow National Park, but hunting and habitat destruction continue because of lack of funds for protection and management. Resurgence in coffee cultivation during last 20 years led to clearance of much second growth; other problems include hurricane damage, widespread pesticide use, planting with pines (*Pinus*), timber removal, deliberate fires, and continuing conversion for small-scale farming and urbanization.
Bibliography. Anon. (1994, 1998a), Bond (1985), Cory & Hellmayr (1927), Downer & Sutton (1990), Faaborg (1985), Raffaele *et al.* (1998, 2003), Reynard *et al.* (1993), Ridgway (1907), Stotz *et al.* (1996).

253. Hispaniolan Pewee

Contopus hispaniolensis

French: Moucherolle d'Hispaniola **Spanish**: Pibí de la Española
German: Hispaniolaschnäppertyrann
Other common names: Greater Antillean Pewee (if lumped with *C. caribaeus* and *C. pallidus*)

Taxonomy. *Tyrannula carriboea* [sic] (var. *hispaniolensis*) H. Bryant, 1867, Santo Domingo, Dominican Republic, Hispaniola.
Formerly treated as conspecific with *C. caribaeus* and *C. pallidus*. Two subspecies recognized.
Subspecies and Distribution.
C. h. hispaniolensis (H. Bryant, 1867) - Hispaniola.
C. h. tacitus (Wetmore, 1928) - Gonâve I, off W Haiti.



Descriptive notes. 15-16 cm. Head and upperparts are greyish-olive, darkest on crown; wings and tail dusky, inconspicuous pale wingbars (often absent); throat grey, olive-brown wash across breast; belly and undertail-coverts yellowish-buff mixed with grey; iris dark; bill broad, blackish, lower mandible pale at base; legs blackish. Sexes alike. Juvenile has pale feather fringes on crown, back and wing-coverts. Race *tacitus* similar to nominate. Voice. Call "purr, pip-pip-pip-pip". Dawn song a loud, rapid series of paired notes rising in pitch, "shurr, pet-pit, pit-pit, peet-peet".
Habitat. Various wooded habitats, including pine (*Pinus*) and broadleaf forests, shade coffee plantations, orchards, forest edges. Sea-level to at least 1800 m.
Food and Feeding. Insects; also small fruits. Searches from low perch, sallying out to capture insects in the air; flicks tail upon landing. Reported as joining mixed-species flocks in pine forests.
Breeding. May-Jun. Nest constructed by female, a cup of rootlets, lichen and moss, placed 3-5 m up in fork of twig. Clutch 2-4 eggs; incubation by female, chicks fed by both parents; no other information.
Movements. Resident. Vagrant on Mona I, between Hispaniola and Puerto Rico; recorded in Bahamas (Providenciales) in Sept after hurricane.
Status and Conservation. Not globally threatened. Restricted-range species: present in Hispaniola EBA. Common and widespread. Haiti is one of the world's most environmentally degraded countries, with remaining forests covering less than 1·5% of its surface area, while c. 10% of forests remain in Dominican Republic; forests continue to be destroyed by logging, slash-and-burn agriculture, charcoal production, and replacement with pine plantations. Only two small national parks exist in Haiti, and c. 22 protected areas (and 15 new areas proposed) covering c. 16% of the area of Dominican Republic, but lack of funds for protection and management threaten their long-term survival.
Bibliography. Anon. (1998a), Bond (1928a), Cory & Hellmayr (1927), Dod (1987), Faaborg (1985), Keith *et al.* (2003), Raffaele *et al.* (1998, 2003), Reynard *et al.* (1993), Rimmer *et al.* (2003), Ridgway (1907), Stotz *et al.* (1996), Wetmore & Swales (1931).

254. Lesser Antillean Pewee

Contopus latirostris

French: Moucherolle gobemouche **Spanish**: Pibí Puertorriqueño
German: Kleinantillen-Schnäppertyrann
Other common names: Puerto Rican Pewee (*blancoi*); St Lucia Pewee (*latirostris*)

Taxonomy. *Myiobius latirostris* J. Verreaux, 1866, St Lucia, Lesser Antilles.
Races sometimes treated as three separate species; nominate, *blancoi* and *brunneicapillus* have occasionally been referred to as, respectively, *oberi*, *portoricensis* and *latirostris*, presumably in error. Three subspecies recognized.
Subspecies and Distribution.
C. l. blancoi (Cabanis, 1875) - Puerto Rico.
C. l. brunneicapillus (Lawrence, 1878) - Guadeloupe, Dominica and Martinique.
C. l. latirostris (J. Verreaux, 1866) - St Lucia.



Descriptive notes. 15 cm. Nominate race has head and upperparts dark olive-brown, paler lores; wings and tail blackish-brown; chin pale, throat and entire underparts rufous-cinnamon; iris dark; bill broad and flat, upper mandible black, lower mandible pale at base; legs black. Sexes alike. Juvenile has pale feather fringes above, also broad cinnamon to brown wingbars, perhaps paler and greyer throat and breast. Race *blancoi* has throat and breast dull ochre tinged greyish-olive, becoming buffier on undertail-coverts; *brunneicapillus* is palest below, pale yellow-brown throat shading to ochre-buff on breast and undertail-coverts. Voice. Song a rising "pree-e-e"; on Puerto Rico described as high-pitched trill rising up the scale (like water filling a glass). Dawn song a repetitive trill. Call a repeated "peet-peet-peet".
Habitat. Mainly montane forest; less frequently drier forest, scrub and mangroves at lower elevations.
Food and Feeding. Insects. Searches from perch low to ground and usually in open area beneath forest canopy; sits erect; sallies from perch to capture prey.
Breeding. Mar-Jun on Puerto Rico and May-Jun on St Lucia. Nest a cup made of leaves, lichen and moss, placed on branch or twig of tree or bush. Clutch 2 eggs; no other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Puerto Rico and the Virgin Islands EBA and Lesser Antilles EBA. Fairly common, but rather local. In 1978, Puerto Rico was covered by 1% virgin forest, 5% shaded coffee plantations, and c. 32% second growth due to natural succession following its conversion from an agricultural country to a more industrial one; over 20 protected areas exist on the island, and private lands also contain large

tracts of mature second growth. The Lesser Antilles have suffered large-scale destruction of forests through agricultural and tourist development, with less destruction on the mountainous islands with inaccessible areas; several reserves exist, but most are relatively small.
Bibliography. Anon. (1998a), Benito-Espinal & Hautcastel (1988), Biaggi (1983), Bond (1985), Cory & Hellmayr (1927), Faaborg (1985), Keith (1997), Raffaele (1989), Raffaele *et al.* (1998, 2003), Ridgway (1907), Tossas & Delannoy (2001).

255. **White-throated Pewee**

Contopus albogularis

French: Moucherolle à bavette blanche **Spanish**: Pibí Gorgiblanco
German: Weißkehl-Schnäppertyrann

Taxonomy. *Myiochanes albogularis* Berlioz, 1962, Maripasoula, Maroni Basin, French Guiana. Monotypic.
Distribution. Locally in Surinam, French Guiana and extreme NE Brazil (Amapá).



Descriptive notes. 13 cm. Small, dark pewee. Has crown dark blackish-grey, slightly paler grey lores, narrow indistinct whitish eyering (more distinct at rear); head side, nape and upperparts uniform dark sooty grey; wings blackish-brown, tail blackish; throat white, underparts sooty grey; iris dark; bill broad, flat, upper mandible black, lower mandible yellow; legs black. Differs from *C. nigrescens* in having white throat. Sexes similar. Juvenile undescribed. Voice. Call "pip-pip-pip".
Habitat. Edge of humid forest and adjacent small clearings; 400-700 m.
Food and Feeding. Insects. Searches for prey from high exposed snag or other perch; sits erect; sallies out to capture aerial prey, returns to same perch repeatedly, shivers tail upon landing.
Breeding. No information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon and very local. In Surinam, common in Brownsberg Nature Park, particularly along roads on the plateau; rare in Lely Gebergte.
Bibliography. Cracraft (1985), Forrester (1993), Haverschmidt & Mees (1994), Meyer de Schauensee (1982), Novaes (1978a), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992).

256. **Blackish Pewee**

Contopus nigrescens

French: Moucherolle noirâtre **German**: Dunkelschnäppertyrann **Spanish**: Pibí Negruzco

Taxonomy. *Myiochanes nigrescens* P. L. Sclater and Salvin, 1880, Sarayacu, Pastaza, Ecuador. Race *canescens* formerly included in *C. cinereus*. Two subspecies recognized.
Subspecies and Distribution.
C. n. nigrescens (P. L. Sclater & Salvin, 1880) - locally on E slope of Andes in Ecuador and N & S Peru; possibly also extreme S Colombia.
C. n. canescens (Chapman, 1926) - disjunctly in S Guyana and E Amazonian Brazil.



Descriptive notes. 13 cm. Small, all-dark pewee. Has dark blackish-grey crown, slightly paler grey lores, narrow indistinct whitish eyering (more distinct at rear); rest of head, nape and upperparts uniform dark sooty-grey; wings blackish-brown, tail blackish; sooty grey below, slightly paler on throat; iris dark; bill broad, flat, upper mandible black, lower mandible yellow; legs black. Sexes similar. Juvenile is like adult, but with narrow whitish wingbars. Race *canescens* has slightly less dark crown, back, throat and upper breast than nominate. Voice. "Pip" or "peep" call, sometimes doubled. Male song a snappy, burry "chí-bew", repeated at intervals of 3-4 seconds, less frequently a hoarse "zur-zur-zur-zur-zur".
Habitat. High canopy and margins of humid forest in foothills, often along streams or near natural forest gaps. At 400-900 m in Ecuador; mainly 800-1050 m in Peru, but 400-1200 in Madre de Dios and recorded to 3000 m at Machu Picchu.
Food and Feeding. Insects. Usually in pairs in Ecuador. Sits erect on high perch in canopy; sallies to catch aerial prey, often returning repeatedly to same perch. Often found in same area, even on same perch, for many days.
Breeding. No information.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare to locally fairly common; probably often overlooked. Fairly common near Taisha (Morona-Santiago) and near Campococha, in Ecuador; rare in San Martín, Huánuco and Amazonas, in Peru.
Bibliography. Blake (1950), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Forrester (1993), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Walker (2002).

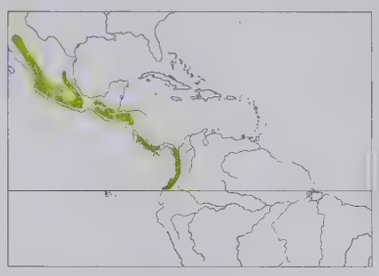
Genus *MITREPHANES* Coues, 1882

257. **Tufted Flycatcher**

Mitrephanes phaeocercus

French: Moucherolle huppé **Spanish**: Mosquero Moñudo Común
German: Gelbbauch-Schnäppertyrann
Other common names: Common Tufted Flycatcher

Taxonomy. *Mitrephorus phaeocercus* P. L. Sclater, 1859, Córdoba, Veracruz, Mexico.
Closely related to *M. olivaceus*, and formerly considered conspecific. Other described races are *burleighi* (Mexican mountains from C Jalisco and W Zacatecas S to W Oaxaca) and *nicaraguae* (Chiapas, in Mexico, S to Nicaragua), both merged with nominate; *vividus* (C & E Panama), merged with *aurantiiventris*; and *eminulus* (Cerro Pirre, in E Panama, and adjoining Chocó, in Colombia), merged with *berlepschi*. Four subspecies recognized.
Subspecies and Distribution.
M. p. tenuirostris Brewster, 1888 - W Mexico, from Sonora and Chihuahua S to Jalisco.
M. p. phaeocercus (P. L. Sclater, 1859) - mountains of E & C Mexico S to El Salvador and NE Nicaragua.
M. p. aurantiiventris (Lawrence, 1865) - Costa Rica and Panama.
M. p. berlepschi Hartert, 1902 - extreme E Panama (Cerro Pirre) and NW Colombia S to NW Ecuador.



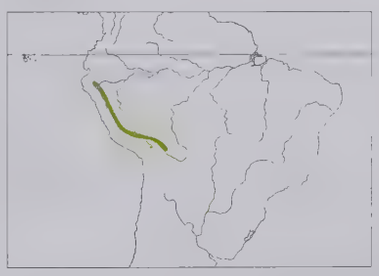
Descriptive notes. 12-13·5 cm; 8·5 g. Nominate race has brown-tinged olive crown, distinct pointed crest; pale loral spot and thin buff-white eyering set against cinnamon face and side of head, contrasted by narrow brownish-olive stripe down nape; upperparts brownish, tinged olive; wings dusky, two buff wingbars, buff margins of secondaries, whitish or pale yellow tertial margins; tail dusky; throat and breast bright ochre to cinnamon, belly ochre-yellow; iris dark; upper mandible black, lower mandible orange-yellow; legs blackish. Sexes similar. Juvenile has crown dark brown, cinnamon-buff feather fringes on crown and upperparts to tail-coverts, perhaps broader cinnamon-orange wingbars. Race *tenuirostris* is paler and duller overall than nominate; *berlepschi* has darker olive crown, yellowish lores, olive back, olive margins of wing-coverts and secondaries, tertials edged more whitish, olive breast with very slight ochre tinge, bright yellow belly; *aurantiiventris* is intermediate, has upperparts and wing margins similar to previous but olive on back perhaps not quite so bright, underparts similar to nominate but perhaps more ochre than cinnamon. Voice. Song single or repeated "tchwee" or "turee" notes; also a "pseeu", "seeeu" or "seer" during breeding season. Call "pik" or "beek". Dawn song in Costa Rica described as a rapid series of high notes, "bip-bip-bip-dididi-up-bip-bip-bibibiseer".
Habitat. Borders, treefall gaps, clearings and broken canopy of montane forests, including pine (*Pinus*), broadleaf and second-growth forests, as well as plantations; also more arid semi-open areas and riparian zones in winter. At 700-3500 m; in Costa Rica most abundant at 1200-2150 m, rare down to 450 m; mainly in foothills, 100-1200 m, in South America.
Food and Feeding. Insects. Usually found in pairs. Sits upright on exposed perch in low to upper levels of forest; sallies to capture prey, often returning to same perch, often shivers tail upon landing.
Breeding. Apr-Jun in Costa Rica and Feb in Colombia (Chocó). Nest a shallow cup of dark rootlets and green moss, liverworts and lichens, lined with foliaceous lichens, placed 4-27 m up saddled in dangling vine, or on upright or horizontal branch hidden in epiphytic vegetation. Clutch 2 eggs; no other information.
Movements. Resident. Altitudinal migrant in parts of Mexico N of isthmus; locally, descends to Sinaloa and Jalisco (NW Mexico) in winter.
Status and Conservation. Not globally threatened. Uncommon to common or fairly common, and local. Fairly common along lower Buenaventura road in Valle, in Colombia; in Ecuador, fairly common near Salto del Tigre bridge over R Guaillabamba, but uncommon at Playa del Oro. Occurs in Rancho Naturalista and Tapantí National Park, in Costa Rica.
Bibliography. Anon. (1998a), Binford (1989), Blake (1958), Cory & Hellmayr (1927), Cracraft (1985), Fleming & Baker (1963), Haffer (1975), Henderson (2002), Hilty (1997), Hilty & Brown (1986), Howell & Webb (1995a), Land (1970), Meyer de Schauensee (1982), Monroe (1968), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Salaman (1994), Schaldach (1963), Skutch (1967), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Thurber *et al.* (1987), Wetmore (1941, 1972).

258. **Olive Flycatcher**

Mitrephanes olivaceus

French: Moucherolle olive **Spanish**: Mosquero Moñudo Oliváceo
German: Olivbauch-Schnäppertyrann
Other common names: Olive Tufted Flycatcher

Taxonomy. *Mitrephanes olivaceus* Berlepsch and Stolzmann, 1894, Garita del Sol, Peru.
Closely related to *M. phaeocercus*, and formerly considered conspecific. Monotypic.
Distribution. C Andes of Peru (S from Cerro Chinguela, in Piura) S to NW Bolivia (La Paz, Cochabamba).



Descriptive notes. 13 cm; 8·5 g. Has olive crown, distinct pointed crest; pale loral spot and thin buff-white eyering; face, nape and upperparts olive; wings and tail dusky, two greyish-olive wingbars, faint pale margins of secondaries and tertials; throat, breast and flanks olive, slight ochre tinge on breast, yellower on central belly; iris dark; upper mandible black, lower mandible orange-yellow; legs blackish. Sexes similar. Juvenile undescribed. Voice. No information.
Habitat. Lower and middle levels of montane forest and borders, at 1000-2000 m.
Food and Feeding. Insects. Usually found in pairs; joins mixed-species flocks. Searches in erect posture from exposed perch in low to upper levels of forest; sallies to capture prey, often returning to same perch, shivers tail upon landing.
Breeding. No information.
Movements. No information.
Status and Conservation. Not globally threatened. Rare to uncommon. Poorly known. Uncommon in Machu Picchu Historical Sanctuary and along Shintuya-Paucartambo road (Cuzco), in Peru. Occurs in Madidi National Park, in Bolivia. Range possibly extends N into S Ecuador.
Bibliography. Chapman (1921), Cory & Hellmayr (1927), Davies *et al.* (1994), Hennessey, Herzog & Sagot (2003), Hornbuckle (1999), Ridgely & Tudor (1994), Stotz *et al.* (1996), Walker (2001, 2002), Zimmer (1930, 1938).



PLATE 34

inches 3
cm 8

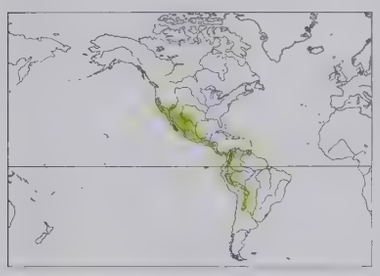
Genus *SAYORNIS* Bonaparte, 1854

259. Black Phoebe

Sayornis nigricans

French: Moucherolle noir **German**: Schwarzkopf-Phoebetyrann **Spanish**: Mosquero Negro
Other common names: White-winged Phoebe (*angustirostris* and *latirostis*)

Taxonomy. *Tyrannula nigricans* Swainson, 1827, Mexico.
Races *latirostis* and *angustirostris* (sometimes synonymized with former) considered a separate species by some authors. Variation clinal: extent of white in wings and on belly generally decreasing N to S; white in wings abruptly increasing S of Isthmus of Panama, thence extent of white, and size, increasing towards S. Six subspecies recognized.
Subspecies and Distribution.
S. n. semiatra (Vigors, 1839) - W USA (S from coastal Oregon, SE to W & C Texas) and W Mexico (Baja California, and S in interior to Isthmus of Tehuantepec).
S. n. nigricans (Swainson, 1827) - NE, C & S Mexico.
S. n. aquatica P. L. Sclater & Salvin, 1859 - Mexico (S of Isthmus of Tehuantepec) S to C Honduras and NW Nicaragua.
S. n. amnicola Bangs, 1902 - Costa Rica and W Panama.
S. n. angustirostris Berlepsch & Stolzmann, 1896 - C & E Panama and N Venezuela S through Andes to C Bolivia.
S. n. latirostris (Cabanis & Heine, 1859) - mountains and foothills of C & S Bolivia and NW Argentina.



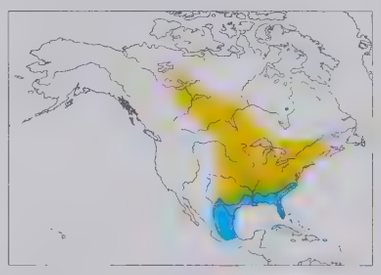
Descriptive notes. 15-18 cm; 18 g. Nominate race has head, upperparts and breast sooty black; wings sooty black, paler margins on wing-coverts (two faint wingbars) and on secondaries (whitish panel); tail long, slightly notched, sooty black, outer web of outer rectrix white; belly and undertail-coverts white; iris dark brown; bill black; legs black. Sexes similar, female duller than male. Juvenile has cinnamon fringes on tips of body feathers, buff-cinnamon wingbars. Race *semiatra* is very like nominate, but more white on belly (extending as inverted V-shape into lower breast), more developed white wing and tail markings; *aquatica* has less white than nominate below, restricted to mid-belly, undertail-coverts sometimes sooty; *amnicola* is darkest, with least white on belly, white edging in wings nearly absent, sooty undertail-coverts; *angustirostris* has extensive white edgings on wings, sooty undertail-coverts; *latirostris* is slightly larger than previous, has slightly broader white edging in tail and wings (white occupying half of outer web of tertials), sooty undertail-coverts. Voice. Typical song of two elements, "tee-hee, tee-hoo", alone or in combination, occasionally accompanied by "tieur"; also described as "pidl-ee, pi-ts-lee" and a thin, buzzy "pi-tsee", usually repeated. Dawn song in Jan-Apr (Panama) described as repeated "peep-feebreew". Typical call a rather sharp, downslurred "tsip". Male also has soft, wheezy chatter, used near female during breeding, and trilled series during flight display (Venezuela) described as "t't't't-esk-u,t't't't, esk-u, psip, esk-u, t't't't". A bi-peaked "tweedle-deedle-eek" used while chasing mate and conspecific intruders. Sometimes loud snaps of bill during aggressive encounters.
Habitat. Semi-open and shaded areas near water, including streams, rivers, lakes, coastal cliffs; also riparian vegetation composed of willow (*Salix*), baccharis (*Baccharis*) and mesquite (*Prosopis*) amid desert scrub in Texas. Also uses man-made canals, city parks, cattle troughs, bridges, buildings and other structures for foraging and nesting. Mainly foothill and montane regions with fast-flowing streams from Mexico S to Argentina. Sea-level to 3000 m.
Food and Feeding. Diet mainly insects and other arthropods, including bees and wasps (Hymenoptera), flies (Diptera), termites (Isoptera), beetles (Coleoptera), dragonflies and damselflies (Odonata), true bugs (Hemiptera), spiders (Arachnida), and grasshoppers (Orthoptera). Most frequent prey type varies regionally and seasonally in some areas. Some individuals adapt to capturing small fish, e.g. mosquito fish (*Gambusia affinis*). Small berries, e.g. elderberry (*Sambucus gluaca*), occasionally consumed. Searches from low perch 1-2 m up, occasionally from the ground; typically jerks or wags tail up and down while perched. Pursues prey in direct aerial sallies (usually less than 2 m); most prey captured in flight, but some caught on the ground, buildings, foliage and other substrates; prey usually eaten on the wing, but larger items brought back to a perch and beaten before swallowing. Typically, changes perch after sallies.
Breeding. Breeds Mar-Jun (pairing Jan-Feb) in SW USA (California); Apr-May in N Colombia (Santa Marta), Jul-Oct in Andes, and Sept-Nov in Argentina. Monogamous, rarely polygynous. Male performs nest-site-showing display by hovering vertically and fanning tail for 5-10 seconds. Nest constructed by female, a hemispherical cup made from mud, grass, plant fibres, sometimes animal hair, lined with woven plant fibres, average external height 13 cm, width 10 cm, depth 12·5 cm, internal diameter 6·5 cm, depth 3·1 cm; cemented to vertical wall, near or over water, typically 1-3 m up and 3-7 cm beneath protective ceiling, sites include dirt ledge, large rock, broken tree limb, bridge or other man-made structure; old nests often reused. Clutch 1-6 eggs, usually 3-6; incubation primarily by female, period on average 15-17 days, longer in colder climates; chicks leave nest together after 14-21 days. Estimated lifetime reproductive success 4·13 male fledglings/male, 5·14 female fledglings/female. Sexually mature at 1 year. Lifespan unknown; average yearly survival rates 71·8% (74·9% for females, 67·4% for males); 31·5% of females and 20·6% of males survive to fifth breeding season; 7·4% of females and 2·9% of males survive to tenth breeding season.
Movements. Resident over most of range; some populations at least partially migratory. Movement patterns, timing and routes poorly known, but differ regionally. Populations in extreme S migrate N to Colombia. N birds often leave breeding range in winter months. Altitudinal movements in some areas (e.g. California, Costa Rica), with movement upslope during breeding season and downslope afterwards.
Status and Conservation. Not globally threatened. Fairly common. Global population estimated at 970,000 individuals. Survey data for USA indicate that this species increased by 1·8% annually between 1966 and 1994, but declines noted in many states after 1980. Artificial structures have greatly increased potential nest-site abundance in many areas; on the other hand, continued water diversion and destruction of riparian habitat in arid SW USA reduce amount of suitable habitat. Habitat conversion and pollution of rivers and streams also of concern in other parts of range. This species' large range and its utilization of artificial habitats should, however, ensure its survival.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bent (1942), Binford (1989), Canevari *et al.* (1991), Contreras (1997), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Fitzpatrick (1980a), Haffer (1975), Henderson (2002), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Kaufman (1996), Lee Jones (2004), Monroe (1968), Narosky & Salvador (1998), de la Peña (1987, 1988), Perry *et al.* (1997), Price *et al.* (1995), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Root (1988), Salaman (1994), Short (1975), Sibley (2000), Skutch (1985), Slud (1964), Small (1994), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Udvardy (1963), Wetmore (1972), Wolf (1997), Zimmer (1930, 1939b).

260. Eastern Phoebe

Sayornis phoebe

French: Moucherolle phébi **German**: Weißbauch-Phoebetyrann **Spanish**: Mosquero Fibí

Taxonomy. [*Muscicapa*] *Phoebe* Latham, 1790, New York, USA.
Monotypic.
Distribution. Breeds mostly in E & C North America, from NW Canada locally E to Maritime Provinces, and from N Great Plains S in USA to C Texas and E to Atlantic coast (S to Georgia). Winters SE and CS USA (locally also NE & SW) S to S Mexico.



Descriptive notes. Male 12·4-16·8 cm, 19·7 g; female 14·2-16·5 cm, 16·9 g. Plumage is greyish-olive above, crown darkest and contrasting with back; wings duskier greyish-olive, feather margins paler, whitish margins of secondaries (sometimes form pale panel on closed wing); throat white, greyish-olive wash across breast, whitish belly and vent sometimes tinged pale yellow; iris dark; bill black; legs black. Sexes similar, female on average slightly smaller than male. Juvenile has pale whitish-buff tips of wing-coverts forming two wingbars. Voice. Common call "chip", "chik" or "piik". Male has two song forms, "fee-bee" and "fee-b-be-bee", both sung in combination, "fee-bee" being more frequent; female rarely sings. Other less frequently used calls include "twee-t", "t-t" or "cheese-it", "t-yooh" or "t-yee", and "t-keet" notes. Also harsh nasal "tree-tree-tree-tree-tree" chatter by male while displaying nest-site to female. Bill-snapping recorded during aggressive encounters.
Habitat. Breeds mainly in forest and forest edge, especially open woodland and frequently deciduous woodland, often near water. Similar habitats during migration, with perhaps stronger preference for riparian vegetation on spring passage. In winter, uses deciduous forest, forest edge, and open and semi-open brushy areas with scattered trees, often near water. Sea-level to 2500 m in winter.
Food and Feeding. Mainly flying insects; occasionally fruit during poor weather in autumn, winter and spring. Diet includes hymenopterans, coleopterans, orthopterans, hemipterans, lepidopterans, dipterans, spiders (Araneae), ticks (Acarina), millipedes (Diplopoda). Recorded also as taking small fish. Searches from low perch less than 10 m up along woodland edge or on lower limbs within closed forest, frequently moving between perches; typically wags tail while perched, by rapidly depressing it, then more slowly raising it with lateral movement (instead of straight back). Prey captured mostly in aerial sallies, also taken from leaves, twigs and the ground by using sally-glean, hover-glean and pouncing manoeuvres. Fruits swallowed whole.
Breeding. Mid-Mar to early Aug, later, from Apr, in N of range; double-brooded. Male displays nest-site to female, female chooses site. Nest, built by female, made of mud, green moss and leaves, lined with fine grass and animal hair, placed 1-5 m up in site often protected by overhead cover, including natural rock outcropping or human structure such as bridge, building or culvert. Clutch 2-6 eggs, usually 5; incubation period c. 16 days, frequently shorter for second broods; fledging period 15-18 days. Success variable, lower in areas with higher brood parasitism by Brown-headed Cowbird (*Molothrus ater*); in E Kansas (USA) nesting success improved from 39·8%-47·1% early in breeding season to 57·1% later in season as brood parasitism decreased; in Indiana (USA) females produced on average 5·97 young per year. Capable of breeding in first season after hatching. Longevity record 9 years; adults 3-4 years old not uncommon.
Movements. Partial migrant. N populations migrate S to S USA and Mexico; present throughout year in some parts of SE & CS USA. Leaves breeding grounds late, following frost-induced insect-prey declines; departure begins Sept in extreme N, Oct over most of range, Nov in more S portions; winters in Mexico late Sept to Apr; arrival on breeding grounds early, following frost-line N, arriving in Mar over much of range, early May in N limits. Casual visitor along Pacific coast and in N Caribbean and Bermuda; vagrant in Europe (England).
Status and Conservation. Not globally threatened. Fairly common to common. Estimated global population 16,000,000 individuals. Survey data for USA indicate no significant decline or increase since 1966, although severe winters (e.g. 1976-1977) can depress populations for several years; in Canada, populations have declined significantly in several provinces. This species' habit of using artificial structures for nesting has contributed to increased regional densities and breeding-range expansion; changing design of such structures and clearing of riparian vegetation, however, have recently had some negative impacts.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Beal (1912), Beheler & Rhodes (2003), Beheler *et al.* (2003), Bent (1942), Binford (1989), Campbell *et al.* (1997), Conrad *et al.* (1998), Cory & Hellmayr (1927), Cuthbert (1962), Cyr & Larivée (1995), DeGraaf & Rappole (1995), Faanes (1980), Farrand (1983), Fitzpatrick (1980a), Graber *et al.* (1974), Hill & Gates (1988), Howell & Webb (1995a), Johnsgard (1979), Kaufman (1996), Klaas (1970), Mengel (1965), Murphy (1994), Peck & James (1987, 1997), Price *et al.* (1995), Raffaele *et al.* (1998), Rappole (1992), Ridgway (1907), Root (1988), Shalaway (1998), Sibley (2000), Small (1994), Smith, W.J. (1969, 2001), Staicer *et al.* (1996), Udvardy (1963), Via (1979), Weeks (1979, 1994), Witham & Hunter (1992).

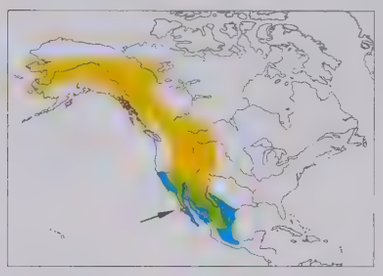
On following pages: 261. Say's Phoebe (*Sayornis saya*); 262. Vermilion Flycatcher (*Pyrocephalus rubinus*); 263. Austral Negrito (*Lessonia rufa*); 264. Andean Negrito (*Lessonia oreas*); 265. Spectacled Tyrant (*Hymenops perspicillatus*).

261. Say's Phoebe

Sayornis saya

French: Moucherolle à ventre roux **Spanish**: Mosquero Llanero
German: Zimtbauch-Phoebetyrann

Taxonomy. *Muscicapa saya* Bonaparte, 1825, Arkansaw River, near Pueblo, Colorado, USA.
Taxonomy yet to be fully resolved, and analysis confounded by problems of wear and fading in museum specimens. Geographical variation in colour weak, perhaps clinal, with paler coloration in arid environments. Birds from Alaska and NW Canada described as race *yukonensis* and those of Mexican Plateau as *pallida*; both merged with nominate, although further research may indicate that one or both should be upheld. Two subspecies currently recognized.
Subspecies and Distribution.
S. s. saya (Bonaparte, 1825) - N Alaska S through W & WC USA to C Mexico; winters from S USA (California E to Texas) S to C & S Mexico.
S. s. quiescens Grinnell, 1926 - NW Mexico (N Baja California and Cedros I).



Descriptive notes. 17-19·5 cm. Slender and relatively small-headed. Nominate race is pale brown-grey above, forehead slightly paler, shading to darker grey crown and nape, lores darker; wings brown-grey, slightly paler margins on wing-coverts and remiges (remiges pale and almost translucent in flight); tail brownish-black, outer rectrix more or less edged whitish; throat and breast grey (paler than upperparts), belly, flanks and undertail-coverts cinnamon; iris dark; bill black; legs black. Sexes similar. Juvenile is slightly browner above than adult, median and greater wing-coverts tipped cinnamon-buff, forming two wingbars. Race *quiescens* is paler grey and less brown than nominate, throat whiter, narrow grey breastband, longer and wider bill. Voice. Most common vocalization "phee-eur", sometimes described as slurred "peeu" or "pu-weet". Song of rapidly repeated "pit-tsee-eur" and "pit eet" notes. Dawn song in Mexico a rapidly repeated series of "p'dew" or "pi'di-hew", with burry rolled "pi-rrep" or "prriip" and "pi-di-reep" phrases mixed in. Also gives chatter call. Bill-snapping reported during aggressive encounters.
Habitat. Breeds in open dry habitats, including prairie, sagebrush, badlands, arid and subtropical scrub, riverbanks, canyons, barren foothills, desert borders. Similar and additional more diverse habitats during migration and winter, including cultivated and riparian areas. Generally sea-level to 2500 m; in USA, breeds as high as 2850 m in Colorado and as low as 60 m below sea-level in California.
Food and Feeding. Mainly arthropods, occasionally some fruit. Diet includes bees and wasps (Hymenoptera), house flies (Muscidae), robber flies (Asilidae), craneflies (Tipulidae), grasshoppers and crickets (Orthoptera), ground beetles (Carabidae), lepidopterans, true bugs (Hemiptera), dragonflies (Odonata), spiders (Arachnida), millipedes (Diplopoda). Fruits consumed include those of elderberry (*Sambucus*), black nightshade (*Solanum*), tarweed (*Madia*) and fig (*Ficus*). Perches on ground, near ground or in low vegetation; frequently wags tail up and down. Uses aerial-sallying, hover-gleaning and pouncing manoeuvres to capture prey from the air, vegetation or ground, returning to same perch or new one.
Breeding. Mid-Apr to early Aug in much of USA and Canada and Mar-Sept in Mexico; commonly double-brooded. Hovering nest-site-showing display by male or female. Nest, built by female, a cup made of rocks, stems, wood pieces, dry grass, moss, plant fibres, dry sage bloom, wool, cocoons, spiderwebs, animal hair, infrequently also mud, often lined with animal hair or wool, average external height 7·9 cm, width 15·8 cm, length 18·6 cm, internal diameter 11·2 cm, depth 2·3 cm; placed in site protected by overhead cover on ledge of cliff face, cave, embankment, rarely in tree cavity, or artificial structure such as bridge, barn, abandoned mine, ranch building; nest often reused, enlarging base; old nest of other species, including *S. phoebe* and *S. nigricans*, Cliff Swallow (*Petrochelidon pyrrhonota*), Collared Sand Martin (*Riparia riparia*), Barn Swallow (*Hirundo rustica*) and American Robin (*Turdus migratorius*), also used. Clutch 3-7 eggs, typically 4-5; incubation period 14-17 days, in Alaska 18 days; fledging period 17-21 days. In Kansas (USA), 53% of pairs fledge more than one young per season and successful pairs fledged average of 6·13 young. Capable of breeding in first year.
Movements. Partial short-distance to long-distance migrant; present all year in much of SW USA and Mexico. Departs breeding grounds in N part of range late Aug to mid-Sept, as late as Oct in Texas; in Mexico, winters on N plateau Nov-Mar, and in Baja California. Pacific slope of Sonora and interior from C region S to Oaxaca Oct-Mar (rarely to Chiapas, Feb); arrival on breeding grounds mid-Feb to Apr in NW California, mid-Mar in Texas, Apr in Kansas, first half May in Alaska. Migration routes little known. Casual in E Canada and C & E USA. Race *quiescens* wanders to SW USA and S to Sonora.
Status and Conservation. Not globally threatened. Fairly common to common. Estimated global population 3,700,000 individuals. Survey data from 1966 to 1996 indicate annual increase of 1·9% across range, with higher rates of increase in Canada. Has probably benefited from use of human structures as nesting sites. In SE Idaho (USA), livestock grazing had no impact on populations, but other habitat alterations due to changing agricultural practices and urbanization may adversely affect this species.
Bibliography. Anon. (1998a), Armstrong (1983), Baicich & Harrison (1997), Bent (1942), Binford (1989), Campbell *et al.* (1997), Contreras (1997), Cory & Hellmayr (1927), DeGraaf & Rappole (1995), DeSante & George (1994), Fitzpatrick (1980a), García *et al.* (1997), González *et al.* (1997), Grinnell & Linsdale (1936), Howell & Webb (1995a), Johnsgard (1979), Kaufman (1996), Oberholser (1974), Phillips *et al.* (1964), Price *et al.* (1995), Ridgway (1907), Rosenberg *et al.* (1991), Root (1988), Ryser (1985), Sauer *et al.* (1997), Schukman (1976), Schukman & Wolf (1998), Sibley (2000), Small (1994), Stotz *et al.* (1996), Udvardy (1963), Unitt (1984), Wauer (1973).

Tribe FLUVICOLINI

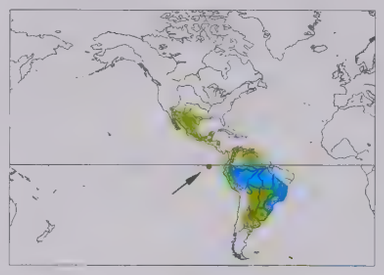
Genus *PYROCEPHALUS* Gould, 1839

262. Vermilion Flycatcher

Pyrocephalus rubinus

French: Moucherolle vermillon **German**: Rubintyrann **Spanish**: Mosquero Cardenal

Taxonomy. *Muscicapa rubinus* Boddaert, 1783, Tefé, Amazonas, Brazil.
Racial boundaries poorly delineated in some cases; further research needed to clarify limits. Galapagos races (*nanus*, *dubius*) sometimes treated as one or two separate species. Birds from SE Peru (Huiro and Chaquimayo) described as race *major*, but validity has repeatedly been questioned; breeding grounds of this purported race unknown. Twelve subspecies recognized.
Subspecies and Distribution.
P. r. flammeus van Rossem, 1934 - breeds SW USA (SE California E locally to Oklahoma and Texas) S to NW Mexico; N populations winter in S of breeding range and S to Central America.
P. r. mexicanus P. L. Sclater, 1859 - S USA (S Texas) S locally to C & S Mexico.
P. r. blatteus Bangs, 1911 - SE Mexico, Belize and N Guatemala.
P. r. pinicola T. R. Howell, 1965 - E Honduras (Mosquitia) and NE Nicaragua.
P. r. nanus Gould, 1839 - Galapagos Archipelago (except San Cristóbal).
P. r. dubius Gould, 1839 - San Cristóbal I (Chatham), in Galapagos.
P. r. saturatus Berlepsch & Hartert, 1902 - NE Colombia, W & N Venezuela, Guyana and N Brazil.
P. r. piurae J. T. Zimmer, 1941 - W Colombia S to NW Peru.
P. r. ardens J. T. Zimmer, 1941- N Peru (extreme E Piura, Cajamarca, Amazonas).
P. r. obscurus Gould, 1839 - W Peru (Lima region).
P. r. cocachacrae J. T. Zimmer, 1941 - SW Peru S to extreme N Chile.
P. r. rubinus (Boddaert, 1783) - breeds SE Bolivia, Paraguay and SE Brazil S to Argentina (S to Río Negro) and Uruguay; winters mostly E of Andes N to E Ecuador and SE Colombia and E through Amazonia and S Brazil.



Descriptive notes. 13-14 cm; 11-14 g. Adult male perhaps most vibrantly coloured of family. Male nominate race has crown bright red, somewhat bushy-crested; lores, ear-coverts and nape sooty black, forming mask; upperparts sooty black; wings sooty black to blackish-brown, sometimes paler tips of median and greater wing-coverts (1-2 faint narrow wingbars); tail sooty-black, slightly darker than rump, narrow whitish tip of outer rectrix; chin, throat, head side (beneath ear-coverts) and underparts bright red; iris dark; bill black; legs black. Female differs dramatically from male: crown pale greyish-brown, dark lores contrasted by greyish-white forehead and supercilium; ear-coverts, nape and back pale greyish-brown, like crown, wings grey with pale margins on wing-coverts and remiges, rump greyish-brown, shading to blackish on uppertail-coverts, short tail blackish with whitish outer web of outer rectrix; throat white, breast white with fine grey streaks extending to flanks; lower flanks, belly and undertail-coverts sometimes tinged yellow or pink. Juvenile resembles female, but broader and whiter wing edges, pale whitish feather tips above back, whitish lower belly and undertail-coverts without yellow or pink tinge; immature male is similar to female, but with variable amounts of pink, orange or red mottling on crown and underparts. Races vary mainly in brightness of red areas and darkness of blackish parts of male, and in colour of lower underparts (ranging from whitish to yellow, pink, salmon and vermilion) and extent of streaking below of female: *mexicanus* has blackest upperparts of N races, but less dark than nominate; *flammeus* has slightly paler and greyer back than previous, red areas more orange-red, female perhaps slightly less streaked; *blatteus* is smaller than last two, red parts brighter; *pinicola* has shorter wings and tail than previous, especially female, female also more heavily streaked across breast and with underparts tinged pink (more of an orange or salmon tinge in N populations); *saturatus* similar to nominate, female is rosy pink on belly; *ardens* has crown and underparts deep orange-red, female distinctive, has pinkish tinge on forecrown, vermilion belly as bright as male's; *piurae* has very dark back, like previous; *obscurus* is very similar to nominate, back slightly less dark, up to 50% of individuals of both sexes melanistic (mainly sooty, male sometimes with variable amounts of red flecking on crown or underparts, female with pinkish lower belly), whereas (as in several other races) pale-morph females have yellow-bellied and pink-bellied forms, in addition to typical whitish-bellied form; *cocachacrae* has back slightly less dark and red areas slightly less bright than previous, both sexes also occur as melanistic morph (sooty black, male sometimes with variable amounts of red flecking on crown or underparts); *nanus* is very small, with smaller bill, has very dark back, perhaps duller rosy red underparts than mainland races, female very different from latter, has white tail tips, white throat, buffy or tawny-yellow breast and belly, faint fine grey-brown streaks on breast and flanks; *dubius* is also small, has back marginally less dark than last, female distinctive, with brown upperparts, buffish-yellow supercilium, greyish-buff throat, buffy yellow below, no streaking on breast or flanks, juvenile male like female but with short streaks on breast and buffy feather tips on back. Voice. Call a high, sharp "peent", "pisk" or "peep", by both sexes while foraging and in aggressive interactions. Song, by male at dawn, during flight display, throughout day and evening (perhaps also at night), a high tinkling "ching-tink-a-le-tink", "p-p-pik-zee" or "pit-a-zee", repeated many times; flight song also described as "titi'tr'e'e'é", "t-t-ti-ti-tee-teeur" or "pt-pt-pre-ee-see". Female gives "tjee-tjee-tjee" call to invite copulation, also during aggressive encounters with males. Other chatters similar to song but often slower. Wing-whirs may also be associated with flight display or flights between perches. Bill-snapping also recorded. Austral migrants wintering in Ecuador usually quiet.
Habitat. Variety of open, dry or moist habitats, often near water, including open woodland, clearings, arid scrub and desert scrub, *cerrado*, savanna, agricultural land; lowland pine (*Pinus*) savanna in E Honduras and NE Nicaragua (race *pinicola*). Sea-level to 3050 m.
Food and Feeding. Arthropods, including butterflies (Lepidoptera), grasshoppers and crickets (Orthoptera), beetles (Coleoptera), termites (Isoptera), bees (Hymenoptera), spiders (Araneae). Searches from low perch, from near ground to 10 m up; perches with fairly erect posture, frequently wagging tail up and down. Once located, prey pursued in aerial or perch-to-ground sallies, often returning to same perch.
Breeding. Mid-Mar to Jul in SW USA (Arizona) and Mexico; Mar-Nov in Venezuela and Oct-Jan in Argentina; fledglings in Jun in Ecuador; 1-2 broods per season. In courtship display, male, in vertical posture, crest raised, breast feathers fluffed, flutters upwards to 20-30 m up while singing, finally descending to perch. Nest a shallow open cup, appearing frail or loosely constructed, of twigs, grass, rootlets and other fibres, lichens and cocoons, bound together by spiderwebs, lined with down, feathers and hair, external diameter 6·4-7·6 cm (rarely, 9 cm), height 2·5-5·1 cm, internal diameter 4·4-5·1 cm, depth less than 2·5 cm; placed 2·4-6 m up, occasionally higher, to 18 m, in bare horizontal fork of bush or tree, sometimes near human habitation. Clutch 2-3 eggs; incubation by female, period 13-15 days; fledging period c. 13-15 days, in Argentina usually 16-18 days; both parents tend nestlings, although female spends more time at nest, whereas male spends much of time provisioning female. Of 188 nests in SW Ecuador, 93 fledged at least one young; nests sometimes parasitized by Shiny Cowbird (*Molothrus bonariensis*). Breeds in first season.
Movements. Mostly resident. Populations in S USA and NW Mexico (Sonora) mostly migrate S as far as Central America; leave breeding grounds late Aug/Sept-Oct, return Mar. S breeders migrate

N to as far as SE Colombia during austral winter. Altitudinal movements by some populations, moving downslope in non-breeding season. Occurs casually N & E of breeding range in USA.
Status and Conservation. Not globally threatened. Uncommon to locally common. Estimated global population 2,000,000 individuals. Population declines reported in SW USA, resulting probably from habitat destruction, cattle grazing, and water-management policies that threaten desert riparian habitats. On the other hand, often adapts to new habitats, such as golf courses and parks; local increases noted in Arizona and Mexico.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bent (1942), Binford (1989), Canevari *et al.* (1991), Carothers (1974), Chesser (1997), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Contreras (1997), Cory & Hellmayr (1927), DeGraaf & Rappole (1995), Di Giacomo (2004), Fiorini & Rabuffetti (2003), Fjeldså & Krabbe (1990), Fitzpatrick (1980a), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Jaramillo (2003), Johnsgard (1979), Johnson (1967), Joseph (1996), Kaufman (1996), Klimaitis & Moschione (1987), Koepcke (1963), Lee Jones (2004), Lowen *et al.* (1996), Marchant (1960), Mason (1985), Mezquida (2002), Miller (1963), Miserendino (1998), Monroe (1968), Narosky & Salvador (1998), Oren & Parker (1997), de la Peña (1987, 1988, 1996), Perry *et al.* (1997), Price *et al.* (1995), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson *et al.* (1988), Root (1988), do Rosário (1996), Rowley (1984), Short (1975), Sibley (2000), Sick (1993, 1997), Small (1994), Smith (1967), Stotz *et al.* (1996), Taylor & Hanson (1970), Williams & Tobias (1994), Wolf & Jones (2000), Zimmer (1930, 1941c).

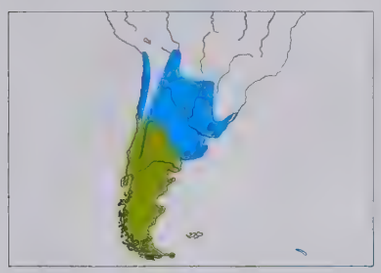
Genus *LESSONIA* Swainson, 1832

263. **Austral Negrito**

Lessonia rufa

French: Lessonie noire **German**: Patagoniensporntyrann **Spanish**: Negrito Austral
Other common names: Patagonian/(Southern) Rufous-backed Negrito

Taxonomy. [*Alauda*] *rufa* J. F. Gmelin, 1789, Buenos Aires, Argentina.
Genus considered closely related to *Knipolegus* and allies on basis of external and internal morphology. Formerly treated as conspecific with *L. oreas*. Monotypic.
Distribution. Breeds from C Chile and C Argentina S to Tierra del Fuego. Winters N Chile, S & E Bolivia, Argentina, Paraguay, SE Brazil and Uruguay.



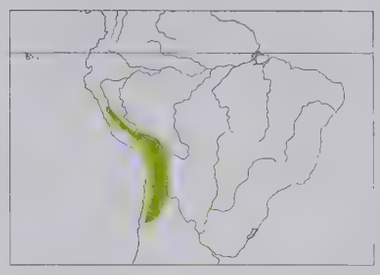
Descriptive notes. 11·5-12·5 cm. Male is black with contrasting rufous-chestnut back; iris dark; bill short, black; legs black; hindclaw exceptionally long, like that of a pipit (*Anthus*). Differs from very similar *L. oreas* in slightly smaller size, slightly darker rufous back, dark (not whitish) inner webs of flight-feathers. Female is very different, has brownish-grey crown, dark brown nuchal collar, white eyestripe and cheek, dull rufous-brown back and scapulars; wings and tail black, outer web of outermost rectrix whitish; buffy white below, breast and sides streaked greyish-brown, flanks and belly buff, vent whitish, small cinnamon underwing patch. Juvenile resembles female, but back more rufescent; moults into immature plumage after two months, adult plumage six months later. Voice. Usually silent; alarm a repeated "tjit-tjit", contact note a short twitter.
Habitat. Open areas with short grass, usually near marshes, coasts, lagoons and beaches; also pastures. Mostly below 1000 m; locally to 2000 m.
Food and Feeding. Small insects. Basically terrestrial, usually rather active. Often perches on low bushes and fences, frequently stands on rocks and small mounds; nervously flicks tail and wings. Runs in pursuit of prey, making short sallies. May follow livestock or humans in grassy field, taking insects flushed by them. Frequently forms small, loose flocks outside breeding season.
Breeding. Breeds Sept-Nov in Chile (but Oct-Jan on Tierra del Fuego), Oct-Jan in Argentina and Dec in Bolivia; probably two broods. Displaying male flutters upwards 10-15 m. Nest a small open cup of grass, small branches or roots, lined with feathers, external diameter 6-12 cm, internal diameter 5 cm, depth 3-5 cm; frequently placed on ground or on cliff ledge, often covered by or beneath overhanging vegetation. Clutch 2-4 eggs; young attended by female only; no other information.
Movements. Migrates N after breeding, dispersing along coasts and then spreading inland across lowlands; possibly some range overlap with *L. oreas* in N Chile and Bolivia during austral winter. Males leave breeding grounds while females still caring for fledglings; on Tierra del Fuego, males depart Dec-Jan and return mid-Sept, females depart with young Feb-Mar and return early Oct. Many migrant flocks apparently made up entirely of one sex. Vagrant in Falkland Is.
Status and Conservation. Not globally threatened. Fairly common to locally abundant. Becoming increasingly common in S part of range. Occurs in all national parks along Patagonian Andes.
Bibliography. Araya & Chester (1993), Babarskas *et al.* (2003), Canevari *et al.* (1991), Chebez & Bertonatti (1994), Chesser (1997), Clark (1986), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2000, 2003), Di Giacomo (2004), Fjeldså & Krabbe (1990), Harris (1998), Hayes (1995), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967), Joseph (1996), Klimaitis & Moschione (1987), Lanyon (1986a), Marín (2004), Meyer de Schauensee (1966, 1982), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Nores *et al.* (1983), de la Peña (1987, 1988), Rey (2001), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Wetmore (1926), Woods (1988).

264. **Andean Negrito**

Lessonia oreas

French: Lessonie des Andes **German**: Andensporntyrann **Spanish**: Negrito Andino
Other common names: Salvin's/White-winged Negrito, (Andean) Rufous-backed Negrito

Taxonomy. *Centrites oreas* P. L. Sclater and Salvin, 1869, Tinta, Cuzco, Peru.
Genus considered closely related to *Knipolegus* and allies on basis of external and internal morphology. Formerly treated as conspecific with *L. rufa*. Monotypic.
Distribution. Andes of C & S Peru, N Chile, W & SW Bolivia and NW Argentina.
Descriptive notes. 12·5 cm. Male is black with pale rufous back; inner webs of flight-feathers silvery white (usually visible only in flight); iris dark; bill short, black; legs black; hindclaw exceptionally long, like that of a pipit (*Anthus*). Differs from very similar *L. rufa* in slightly smaller size, slightly paler rufous back, whitish inner webs of remiges. Female is smaller than male, blackish-brown above, back dull rufous, chin whitish, sooty below, breast side dull rufous, crissum blackish; much darker below than female *L. rufa*. Juvenile is like female, but much paler overall. Voice. Contact call a short, rather faint "tyt", repeated at c. 0·5-second intervals; alarm a very high-pitched "zi".



Habitat. Montane lakes, streams and bogs with short vegetation and muddy areas, heavily grazed lakeshores, also seasonally flooded plains. Mostly 3000-4000 m; occasionally above 4000 m (Peru) or below 1000 m (Chile). Replaces *L. rufa* in Altiplano.
Food and Feeding. Small insects. Usually occurs in pairs or family groups. Basically terrestrial. Frequently perches on tussocks or other slightly elevated perches. Makes short sallies and flights to catch insects close to or on ground; also pursues prey by running on ground in short quick bursts.
Breeding. Oct-Jan in N Chile. Displaying male flutters upwards 10-15 m. Nest usually an open cup similar to that of *L. rufa*, concealed in tussock or grass. Clutch 3-4 eggs; no other information.
Movements. Resident. May overlap with *L. rufa* in N Chile and Bolivia, during austral winter.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Becomes more numerous towards N of range. Occurs in Lauca National Park, in Chile, and common around Junín National Reserve, in Peru.
Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chapman (1921), Chesser (1997), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Jaramillo (2003), Johnson (1967), Kent *et al.* (1999), Koepcke (1970), Lanyon (1986a), Marín (2004), Meyer de Schauensee (1966, 1982), Narosky & Salvador (1998), Ridgely & Tudor (1994), Rocha & Peñaranda (1995), Rocha & Quiroga (1996, 1998), Ridgely & Greenfield (2001), Sick (1993), Stotz *et al.* (1996), Traylor (1977), Walker (2001), Zimmer (1930).

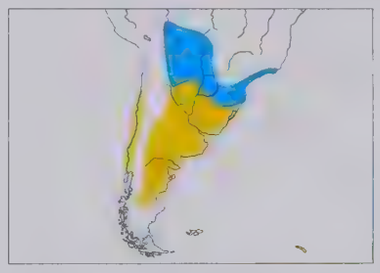
Genus *HYMENOPS* Lesson, 1828

265. **Spectacled Tyrant**

Hymenops perspicillatus

French: Ada clignot **German**: Brillendunkeltyrann **Spanish**: Viudita Picoplata

Taxonomy. *Motacilla perspicillata* J. F. Gmelin, 1789, Montevideo, Uruguay.
Name formerly used for genus was *Lichenops*, but present name has priority. Appears closely allied to *Knipolegus*. Two subspecies recognized.
Subspecies and Distribution.
H. p. perspicillatus (J. F. Gmelin, 1789) - extreme SE Brazil, Paraguay and Uruguay S in lowlands to CS Argentina (Río Negro); winters in Paraguay, C Bolivia and S Brazil.
H. p. andinus (Ridgway, 1879) - breeds C Chile (Atacama S to Aisén) and S Argentina (W Río Negro, Chubut, N Santa Cruz); winters in N Argentina.



Descriptive notes. 13-16 cm. Distinctive, with prominent greenish-tinged yellow fleshy wattle around eye. Male is black overall; primaries mostly white with black base and tips (visible at rest, conspicuous in flight); iris yellow; bill pale yellow, appearing almost white at distance; legs black. Female is dark brown above, buffy or buff-white supercilium and pale lores, wattle reduced and duller; back streaked black with pale brown edges; two buffy wingbars, distinctive rufous remiges (visible in flight); tail dark; pale dusky or whitish below, dusky streaking across chest; bare parts as male, but bill dusky with brown lower mandible. Both sexes have wattle reduced in non-breeding season. Juvenile is similar to female. Race *andinus* is slightly larger than nominate, white area of outer five primaries somewhat reduced, wing slightly shorter, female has breast less boldly streaked. Voice. Usually silent. Male utters a series of thin, squeaky notes; during display, male utters "zheeeee", also "buzz" produced by primaries.
Habitat. Marshes, grassy or shrubby areas, rivers, open lands, and fields and pastures near water; sea-level to c. 2000 m, locally to 3350 m.
Food and Feeding. Insects. Usually solitary. Prey pursued and captured on the ground, or during sallies from posts, bushes or reeds.
Breeding. Oct-Jan in Argentina and Nov-Jan in Chile. During spectacular display, male rises up to 10 m above perch, making loud bill-snap at peak, then drops straight down, wings half-closed, uttering loud cry; primaries produce buzzy whistle throughout flight; male often perches on fence posts or other exposed lookouts. Nest an open but small, deep cup, hidden in or at base of shrub near ground, usually in clump of grass or reeds, sometimes attached to reeds; for three nests in Argentina, external diameter 4·4-10 cm, internal diameter 3·5-6·5 cm, depth 3·7-6 cm. Clutch 2-4 eggs; no information on incubation and fledging periods. Nests sometimes parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Partial migrant; some populations in S Paraguay apparently resident. After breeding, nominate race migrates N to Paraguay, C Bolivia and S Brazil; *andinus* migrates E across Andes from Chile to lowland Argentina. Accidental in Peru, e.g. Tambopata-Candamo Reserved Zone (Cuzco).
Status and Conservation. Not globally threatened. Fairly common to common. Abundant near coastal marshes in S Buenos Aires (Argentina) in Apr. Fairly common in Los Glaciares National Park, in Argentina; occurs also in several other national parks and protected areas, especially in non-breeding season.
Bibliography. Babarskas *et al.* (2003), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Di Giacomo (2004), Fjeldså & Krabbe (1990), Friedmann (1927), Harris (1998), Hayes (1995), Jaramillo (2003), Johnson (1967), Klimaitis & Moschione (1987), Joseph (1996), Lowen *et al.* (1996), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1987, 1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Wetmore (1926).


266
267
268
ssp signatus
269
270
271
ssp salvini
ssp poecilurus
ssp cabanisi
ssp orenocensis
ssp xinguensis
272
ssp sclateri
ssp aterrimus
ssp anthracinus
273
275
ssp franciscanus
ssp heterogyna
274
PLATE 35
inches 3
cm 8

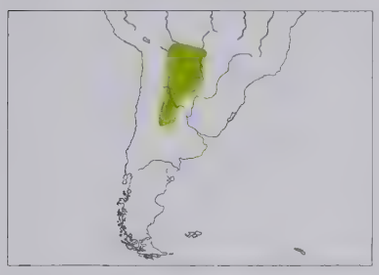
Genus *KNIPOLEGUS* Boie, 1826

266. Cinereous Tyrant

Knipolegus striaticeps

French: Ada cendré **German**: Schwarzmasken-Dunkeltyrann **Spanish**: Viudita Chaqueña

Taxonomy. *M[uscisaxicola] striaticeps* d'Orbigny and Lafresnaye, 1837, "La Paz" = Chiquitos, Bolivia.
Formerly placed in a monotypic genus, *Entotriccus*, on basis of uniformly narrow primaries of both sexes. Monotypic.
Distribution. E & S Bolivia (Santa Cruz, Tarija), S Brazil (Mato Grosso), W Paraguay (W of R Paraguay) and NW Argentina (Jujuy and Formosa S to Córdoba and La Rioja).



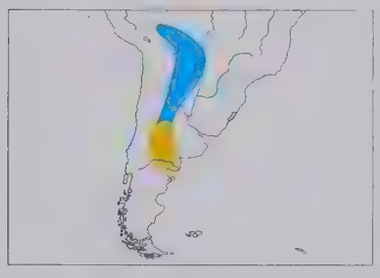
Descriptive notes. 13-13·5 cm. Male is mostly dark grey, darker head imparting distinctly hooded effect; face blackish-grey; wings dusky grey or blackish-grey, two narrow pale grey wingbars, inner remiges edged greyish; tail dusky, outer web of outer rectrices pale; throat and chest duskier; lower underparts greyish-white or whitish with fine dusky streaks; iris bright scarlet-red; bill black; legs black. Differs from congeners in smaller size, no concealed white in wings. Female is olive-brown above, rufous on crown, lores whitish, nape with dusky streaking; wingbars white, uppertail-coverts rufous, tail with rufous inner webs, iris pale brown; smaller and with less deep rufous tail-coverts than female *K. hudsoni*. Voice. Quiet; displaying male gives "ts-ip" call while perched, and staccato "skidi-ik" (possibly wing noise) at bottom of display-flight.
Habitat. Chaco woodland, borders and openings; also dense groves of forest in *campo* regions in Brazil. Mostly below 1000 m, locally to 1900 m.
Food and Feeding. Insects. Usually found singly, occasionally in pairs. Perches on exposed bushes or low trees, erect and alert, frequently twitching tail; sallies for prey.
Breeding. Recorded in Nov-Feb in Argentina. Displaying male flies up from exposed perch to 8-15 m, folds wings and drops to new perch. In Argentina, nest an open cup made from grass, horsehair and feathers, placed in cactus; clutch 2 eggs. No other information.
Movements. Not well known. Reportedly migratory in S part of range, but details unknown; single specimen in Paraguay E of R Paraguay suggests some movement.
Status and Conservation. Not globally threatened. Fairly common to locally common. Chaco woodland is increasingly being cleared for cattle grazing and agriculture, putting this species at some risk.
Bibliography. Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Di Giacomo (2004), Dubs (1992), Hayes (1995), Lanyon (1986a), López (1997), Meyer de Schauensee (1966, 1982), Miserendino (1998), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), Olrog (1979b), de la Peña (1988), Ridgely & Tudor (1994), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Wetmore (1926).

267. Hudson's Black-tyrant

Knipolegus hudsoni

French: Ada de Hudson **German**: Weißflanken-Dunkeltyrann **Spanish**: Viudita Patagona

Taxonomy. *Cnipolegus hudsoni* P. L. Sclater, 1872, Río Negro, Patagonia.
Formerly placed with *K. poecilocercus* in defunct genus *Phaeotriccus* on basis of shape of outer primaries. Monotypic.
Distribution. Breeds C Argentina from Córdoba S to Neuquén, Río Negro and SW Buenos Aires; migrates N to Bolivia and S Brazil.



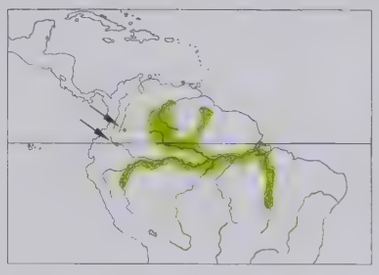
Descriptive notes. 15·5 cm. Male plumage is shiny black, underwing with large white patch across inner webs of primaries (conspicuous in flight, not visible when perched); some whitish on lower flanks; outer three primaries strongly narrowed; iris red; bill blue-grey, tipped black; legs black. Distinguished from very similar *K. aterrimus* by much smaller size; from similar *K. poecilocercus* by larger size, white on underwing. Female is greyish-brown above, becoming rufous on rump and basal half of tail, terminal tailband blackish, wings dusky with two buff wingbars, outer primaries as male, buffy below with mottled dusky-olive streaking across breast, fewer streaks on belly; similar to female *K. atterimus* but smaller, with heavy streaking below. Voice. Irregular "ric-tic-titireetic" and snapping sounds.
Habitat. Low woodland and scrub; also Chaco and overgrown pastures and gardens in non-breeding season. Mostly below 500 m.
Food and Feeding. Little known. Insects eaten. Usually inconspicuous, preferring dense cover close to ground.
Breeding. Male displays from emergent, usually dead tree, jumping restlessly from branch to branch, occasionally flying up and vocalizing. Nest an open cup, usually placed in small tree or bush. No other information.
Movements. Migrates N in Aug-Sept to Paraguay, Bolivia and S Brazil; recorded as far N in Mato Grosso as Serra do Roncador.
Status and Conservation. Not globally threatened. Generally rare to locally uncommon. Fairly common to common during breeding season in Lihué Calel National Park (La Pampa); has been recorded during migration in Beni Biosphere Reserve, in Bolivia. N limit of breeding uncertain; possibly extends farther N than currently known.
Bibliography. Brace *et al.* (1996, 1997), Canevari *et al.* (1991), Chebez (1994), Chesser (1997), Collar *et al.* (1994), Cory & Hellmayr (1927), Davis (1993), Fjeldså & Maijer (1996), Joseph (1996), Lanyon (1986a), Meyer de Schauensee (1966, 1982), Narosky & Di Giacomo (1993), Narosky & Yzurieta (1993), Nores *et al.* (1983), Hayes (1995), de la Peña (1988), Ridgely & Tudor (1994), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Veiga *et al.* (2002), Wetmore (1926).

268. Amazonian Black-tyrant

Knipolegus poecilocercus

French: Ada d'Amazonie **German**: Várzeadunkeltyrann **Spanish**: Viudita Amazónica

Taxonomy. *Empidochanes poecilocercus* Pelzeln, 1868, River Amajaú, Rio Negro, Brazil.
Formerly placed with *K. hudsoni* in defunct genus *Phaeotriccus* on basis of shape of outer primaries. Monotypic.
Distribution. S Venezuela (W Apure, Amazonas), N Brazil (R Negro S to N bank of Amazon and to R Nhamundá, also E on S bank to R Tocantins) and NE Peru (Sarayacu, R Ucayali); also locally in Guyana, E Colombia (W Meta) and NE Ecuador.



Descriptive notes. 12·7-13·5 cm; 14 g. Large eyes, long rictal bristles. Male is glossy black with slight bluish sheen; primaries tinged brownish, outer three short, narrow and pointed (visible in hand); iris dark; bill stout, bluish or bluish-grey, tipped black; legs black. Distinguished from similar *K. orenocensis* by considerably smaller size, glossier plumage. Female is olive-brown above, lores and eyering greyish-white, uppertail-coverts rufous, wings dusky with two cinnamon-buff wingbars and buff edgings, outer primaries as male, short tail dusky, edged cinnamon, pale buff below, lower throat, breast and flanks streaked brownish-olive (forming chestband), underwing-coverts white, large eyes dark brown, bill dusky brown; differs from similar *Myiophobus fasciatus* in more olive plumage, rufous tail-coverts, stronger streaking below. Voice. Unusually quiet. Displaying male has faint clicking "tic-dik" or vaguely trebled "see-sa'lick" or more buzzy "bzzéa", also high "tsik" while opening wings slightly; female a louder "pit-pit".
Habitat. *Várzea* forests, prefers dark vine tangles near open water; also damp thickets and seasonally flooded areas. To 350 m.
Food and Feeding. Insects. Usually solitary or in pairs, inconspicuous unless displaying; female sometimes associated loosely with mixed-species flocks. Often perches at or below eye level. Sallies to foliage, occasionally to surface of shallow water or to the ground; movements often sudden and reminiscent of those of a manakin (Pipridae).
Breeding. Nest-building in Feb in Venezuela (Hato Cedral) and Jul in Brazil. Displaying male, usually from thick vine, jumps vertically, calls, and returns to original perch, sometimes makes soft snapping sound; in presumed aggressive display follows other males, holding head and tail lowered and wings fanned. Nest (Brazil) an untidy ball of moss and grass, 1 m up in branch fork at edge of small forest stream. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare or uncommon to locally common; probably often overlooked. Occurs in Alto Orinoco-Casiquiare Biosphere Reserve, in Venezuela, and Anavilhanas Ecological Station and Jaú and Tapajós National Parks, in Brazil.
Bibliography. Cory & Hellmayr (1927), Cracraft (1985), Hilty (1999, 2003), Hilty & Brown (1986), Lanyon (1986a), Meyer de Schauensee (1966, 1982), Oren & Parker (1997), Peres & Whittaker (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schubart *et al.* (1965), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Traylor (1977), Zimmer (1937a, 1937b).

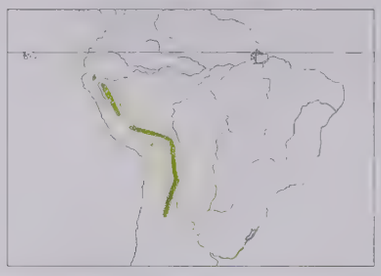
269. Andean Tyrant

Knipolegus signatus

French: Ada de Jelski **German**: Andendunkeltyrann **Spanish**: Viudita Andina
Other common names: Jelski's Bush-tyrant (*signatus*); Plumbeous (Andean) Tyrant (*cabanisi*)

Taxonomy. *Ochthodiaeta signatus* Taczanowski, 1875, Auquimarca and Ninabamba, Peru.
Taxonomic history complex. Races earlier treated as two distinct species in separate genera, nominate being placed in *Ochthodiaeta* (now *Myiotheretes*) and *cabanisi* in present genus; subsequent authors generally considered them conspecific, and moved nominate to current genus, although with suggestion by some that they may be separate species. More recently, various authors have treated races either as conspecific or as representing two distinct species forming a superspecies. Two subspecies recognized.
Subspecies and Distribution.
K. s. signatus (Taczanowski, 1875) - extreme S Ecuador, N & C Peru (Amazonas to Huánuco, Junín).
K. s. cabanisi Schulz, 1882 - SE Peru (E Cuzco, N Puno), SE Bolivia (Cochabamba, Santa Cruz, Tarija) and NW Argentina (Jujuy S to Catamarca and Tucumán).
Descriptive notes. 14·5-16·5 cm. Male nominate race has plumage uniform sooty black; iris dark red or chestnut; bill blackish; legs black. Differs from *K. aterrimus* in less shiny black plumage, no white in wing. Female is dark dull olive-brown above, more rufous on uppertail-coverts, two whitish to buff wingbars, dusky tail narrowly edged cinnamon-rufous, broadly streaked dark greyish-olive below, especially on breast (often uniform-looking), dark buffy crissum. Juvenile is like female, upperparts washed rusty, wingbars white, pale yellow panel on wing, pale streaks below more extensive, tinged pale yellow. Race *cabanisi* is smaller than nominate, overall more dark slate-grey, wings and tail dusky, inner webs of remiges edged white, paler below, especially lower belly, bill blue-grey with black tip and paler lower mandible; female dull brown above, becoming bright rufous on tail-coverts and edges of tail feathers, two buffy-white wingbars and ochraceous

On following pages: 270. Blue-billed Black-tyrant (*Knipolegus cyanirostris*); 271. Rufous-tailed Tyrant (*Knipolegus poecilurus*); 272. Riverside Tyrant (*Knipolegus orenocensis*); 273. White-winged Black-tyrant (*Knipolegus aterrimus*); 274. Crested Black-tyrant (*Knipolegus lophotes*); 275. Velvety Black-tyrant (*Knipolegus nigerrimus*).



wing panel, buffy white below, broadly streaked greyish-olive, especially on breast (sometimes uniform), bill blackish. Voice. Male (race *cabanisi*) utters "tec" call, also makes wing-whirring noise, during display.

Habitat. Interior of lower growth of humid montane forest and woodland, less often at borders; also along paths, edges, clearings in patchy woods, and in alder (*Alnus*) thickets and second growth on slopes along streams. At 1900-3050 m in N of range (nominate); 700-2500 m in S (*cabanisi*).

Food and Feeding. Little known. Insects. Usually inconspicuous and quiet; also generally solitary, and does not follow mixed-species flocks. Perches upright, with head tucked between shoulders, breast feathers puffed, and tail constantly vibrating or shivering from side to side.

Breeding. Eggs in Oct-Jan in Argentina. Displaying male flies straight up for 2-10 m with wing-whirring, glides at top and makes "tec" sound, then drops, wings closed, back to perch. Nest an open cup made of grasses and moss, lined with feathers, external diameter c. 14 cm, height 7·5-12 cm, internal diameter 4-6 cm, depth 3-4 cm, usually up to 4 m above ground on horizontal branch in small tree or bush. Clutch 1-3 eggs. Nest parasitism by Shiny Cowbird (*Molothrus bonariensis*) recorded. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Rare and very poorly known in Peru; fairly common in Argentina. Occurs in Machu Picchu Historical Sanctuary, in Peru, Pilón Lajas Biosphere Reserve and Iñao, Tarija and Madidi National Parks, in Bolivia, and Baritú and Calilegua National Parks, in Argentina. Readily found in alder woodland in the Yala Valley above city of Jujuy, in N Argentina.

Bibliography. Babarskas *et al.* (1995), Canevari *et al.* (1991), Cracraft (1985), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Hennessey & Gómez (2003), Hennessey, Herzog & Sagot (2003), Mayr (1971), Meyer de Schauensee (1966, 1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (2000), de la Peña (1988, 2001a), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1982), Walker (2001).

270. **Blue-billed Black-tyrant**

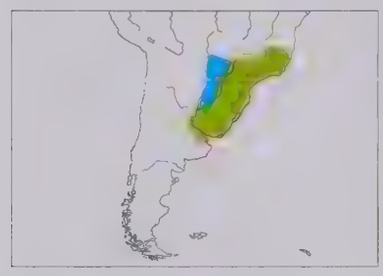
Knipolegus cyanirostris

French: Ada à bec bleu **German**: Einfarbdunkeltyrann **Spanish**: Viudita Picoceleste

Taxonomy. *Muscicapa cyanirostris* Vieillot, 1818, Paraguay.

Monotypic.

Distribution. SE Brazil (N to Minas Gerais and Espírito Santo), Uruguay and NE Argentina (Misiones S to Buenos Aires); S populations winter N to SC Brazil (S Mato Grosso) and E Paraguay.



Descriptive notes. 14·5-15 cm. Male plumage is all glossy black, except for faint white edges on underwing (remiges); iris bright red; bill pale blue bill with black tip; legs black. Female is rufous-brown above, crown brighter rufous, rump rufous, tail-coverts bright cinnamon, blackish wings with two buff to cinnamon wingbars, dusky tail edged rufous, whitish to yellowish-white below, heavily streaked blackish-brown and dirty white, crissum cinnamon-rufous, iris pale red to orange, bill blackish, usually with bluish lower mandible; distinguished from *K. striaticeps* by larger size and darker overall coloration, from similar *Myiophobus fasciatus* by much larger size, more prominent streaking below. Voice. Generally quiet; barely audible "it" call while perched.

Habitat. Borders of humid forest and gallery woodland, less often venturing out into shrubby semi-open areas, usually near water; usually not found in interior of forest. Below 2200 m.

Food and Feeding. Insects. Usually in pairs, often inconspicuous. Generally perches at low levels; occasionally takes high exposed perch for protracted periods. Hunts in short, rapid sallies or gleans from foliage, often remaining low.

Breeding. Little known. Nov-Dec in Argentina. Male, with wings raised, glides silently down in front of female. Nest an open cup made of small sticks and grass, lined with soft material and feathers, placed on tree branch, sometimes at outer end; one nest with external diameter 11·5 cm, height 6 cm, internal diameter 5 cm, depth 4 cm. Clutch 1-3 eggs. Nest parasitism by Shiny Cowbird (*Molothrus bonariensis*) recorded. No other information.

Movements. Austral migrant; those breeding in S of range mainly migrate N as far as Paraguay and SC Brazil (Mato Grosso) during austral winter.

Status and Conservation. Not globally threatened. Uncommon to locally common or abundant. Appears to be most numerous in SE Brazil, e.g. Rio Grande do Sul. Recorded in Mata dos Godoy State Park (Paraná), Patrimônio Natural do Caraça Special Reserve and Aparados da Serra, Caparaó and Itatiaia National Parks, all in Brazil, and San Juan de Poriahú Private Reserve (in Iberá Provincial Reserve), in Argentina.

Bibliography. Babarskas *et al.* (2003), Belton (1985), Blake, E.R. (1953), Canevari *et al.* (1991), Cory & Hellmayr (1927), Di Giacomo (2004), Dubs (1992), Guix (1995), Hayes (1995), Joseph (1996), Klimaitis & Moschione (1987), López (1997), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Wetmore (1926), Willis (1988).

271. **Rufous-tailed Tyrant**

Knipolegus poecilurus

French: Ada à queue rousse **German**: Fahlbauch-Dunkeltyrann **Spanish**: Viudita Colirrufa

Taxonomy. *Empidochanes poecilurus* P. L. Sclater, 1862, "Bogotá", Colombia.

Formerly placed in genus *Cnemotriccus*, and later in a newly erected monotypic genus, *Eumyiobius*; appears, however, to be closely related to members of present genus, despite lack of marked sexual plumage dimorphism. Races generally poorly differentiated, and individual variation often greater than variation among taxa; further evaluation needed. Five subspecies currently recognized.

Subspecies and Distribution.

K. p. poecilurus (P. L. Sclater, 1862) - mountains of Colombia (except Santa Marta) and extreme NW Venezuela (Sierra de Perijá).

K. p. venezuelanus (Hellmayr, 1927) - W & N Venezuela (Táchira, Mérida, Distrito Federal).

K. p. paraquensis Phelps, Sr & Phelps, Jr, 1949 - Cerro Sipapo (Paraque), in NW Amazonas (Venezuela).

K. p. salvini (P. L. Sclater, 1888) - S Venezuela (cerros of C & S Amazonas and S Bolívar) and immediately adjoining N Brazil and W Guyana.

K. p. peruanus (Berlepsch & Stolzmann, 1896) - Andes from E Ecuador S to SE Peru (Cuzco) and C Bolivia.



Descriptive notes. 14·5-15 cm; 13-15 g. Male nominate race is greyish to brownish-grey above; wings dusky, two broad buffy-grey wingbars (often absent), buff edges of inner remiges; tail dusky, inner webs broadly edged cinnamon (conspicuous in flight); throat whitish, underparts mostly dull buffy grey or cinnamon-buff, washed with grey across breast; underwing-coverts cinnamon; iris red (not conspicuous); bill fairly long, black; legs black. Female is slightly browner than male. Juvenile is washed with rufous, has iris brown, more extensive rufous in tail webs, cinnamon wingbars often present. Race *peruanus* is similar to nominate, on average darker, highly variable (depending on age, also degree of wear); *salvini* is grey above, contrasting white belly and rufous vent, no wingbars, adult male with very little rufous in tail; *venezuelanus* is intermediate between previous and more cinnamon-tinged nominate; *paraquensis* is smaller and darker overall, with plain wings and no rufous in tail. Voice. Usually quiet; call a short, metallic trill, "tzteeer" or "triiit".

Habitat. Borders of humid and wet montane or second-growth forest, pastures with scattered trees, and grassy slopes with some scrub; also dense, stunted second growth dominated by melastomes (Melastomataceae) on white sandy soils. At 650-3100 m; 900-2400 m in N (Venezuela).

Food and Feeding. Insects. Usually singly or in pairs, seldom with mixed-species flocks. Perches upright, sometimes in the open, but sometimes shy; often lifts tail and then slowly lowers it, or cocks tail; recalls *Sayornis*. Makes short sallies for flying prey from low bushes, or drops to the ground.

Breeding. Birds with enlarged gonads in Mar-Sept in Colombia. No other information.

Movements. Resident; probably wanders more often than reported, frequently appearing at fresh landslides where previously not present. Worn specimen from Bolivia identified as of race *venezuelanus*, although in range of quite different *peruanus*.

Status and Conservation. Not globally threatened. Generally rare to uncommon, locally more common. Common at La Planada Nature Reserve (Nariño), in Colombia; uncommon around treefalls and in stunted ridgecrest forest (from 1300 m upwards) on Mt Roraima, in Guyana. Also occurs in Podocarpus National Park, in Ecuador, and Machu Picchu Historical Sanctuary, in Peru.

Bibliography. Barrowclough *et al.* (1997), Chapman (1917c, 1921, 1931), Cory & Hellmayr (1927), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Mayr & Phelps (1967), Meyer de Schauensee (1982), Miller (1963), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Stotz *et al.* (1996), Strewe (2000a), Walker (2001), Willard *et al.* (1991).

272. **Riverside Tyrant**

Knipolegus orenocensis

French: Ada de l'Orénoque **German**: Flussufer-Dunkeltyrann **Spanish**: Viudita Ribereña

Taxonomy. *Cnipolegus orenocensis* Berlepsch, 1884, Angostura [= Ciudad Bolívar], River Orinoco, Venezuela.

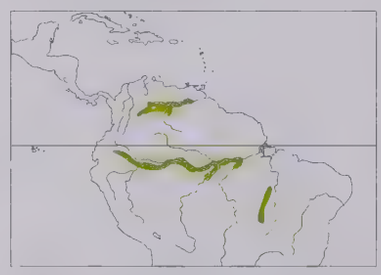
Race *sclateri* possibly a separate species, exhibits marked sexual plumage dimorphism whereas nominate and *xinguensis* do not; insufficient information currently available to enable full assessment of taxonomy. Three subspecies recognized.

Subspecies and Distribution.

K. o. orenocensis Berlepsch, 1884 - E Colombia (NE Meta) and C Venezuela (lower R Apure and upper R Orinoco E to Ciudad Bolívar).

K. o. sclateri Hellmayr, 1906 - NE Ecuador (R Napo) through NE Peru (E Loreto) to NC Brazil (R Madeira E to R Tapajós).

K. o. xinguensis Berlepsch, 1912 - E Brazil (lower R Xingu and R Araguaya).



Descriptive notes. 15-15·5 cm; 19 g. Male nominate race is uniform slate-grey or blackish-grey, head blackest with slight crest, giving slight "puff-headed" appearance; iris dark; bill thickish, pale blue-grey, black tip; legs black. Female is slightly paler than male, slate-grey with olive tinge. Juvenile resembles female, underparts with blurry buff streaking. Race *xinguensis* is very like nominate, but slightly larger, female somewhat paler; *sclateri* male is uniformly dull black, female very different, dull olive-grey above, rump washed rufescent, pale below, coarse olive-greyish streaks on throat, chest (especially) and flanks, juvenile brownish-grey with rufous rump, rufous edging and tips on wing-coverts (faint wingbars), rufous edges of rectrices, buff-tinged underparts with diffuse streaking. Voice. Soft, musical "peéeo" with downward inflection; "tuk" contact note during foraging; call a soft stuttering "pi-weet" or "pi-piweet". Displaying male produces mechanical snaps.

Habitat. Semi-open scrub along rivers and near lakes; most often in early-successional growth (especially among *Tessaria* and *Cecropia* saplings) on seasonally flooded river islands. Occurs below 300 m.

Food and Feeding. Insects. Usually singly or in pairs. Sometimes perches conspicuously on bushes or low trees (though usually in partial cover), especially in morning; at other times, however, wary and difficult to approach. Frequently drops to the ground in pursuit of prey; less often sallies to grass or aerially.

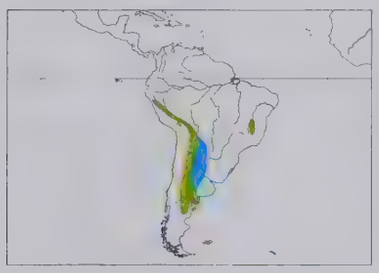
Breeding. Mar in E Colombia (NE Meta); juvenile in Apr in Venezuela; family party seen in Sept in Ecuador. Male has display typical of genus, repeatedly flies straight up and then drops. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon and local; restricted to Orinoco and Amazon rivers and some of their tributaries. Regularly found on river islands near Puerto Ayacucho, in Venezuela; few records from Ecuador, along R Napo near La Selva Lodge.
Bibliography. Cherrie (1916), Cory & Hellmayr (1927), Friedmann (1948), Hilty (1999, 2003), Hilty & Brown (1986), Forrester (1993), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Zimmer (1937a).

273. White-winged Black-tyrant

Knipolegus aterrimus

French: Ada à ailes blanches **German**: Weißspiegel-Dunkeltyrann **Spanish**: Viudita Aliblanca
Other common names: Caatinga Black-tyrant (*franciscanus*)

Taxonomy. *Cnipolegus aterrimus*, Kaup, 1853, Cochabamba, Bolivia.
Geographically isolated race *franscianus* has been considered to be a separate species, but field data and museum specimens generally lacking; current treatment maintained pending further information. Four subspecies recognized.
Subspecies and Distribution.
K. a. heterogyna Berlepsch, 1907 - N Peru (Marañón Valley from Cajamarca S to Ancash).
K. a. anthracinus Heine, 1859 - S Peru (Ayacucho, Cuzco, N Puno) and NW Bolivia (La Paz).
K. a. aterrimus Kaup, 1853 - S Bolivia (Cochabamba and Santa Cruz S to Potosí and Tarija) and W Argentina (S to Chubut); also Paraguay and NE Argentina in non-breeding season.
K. a. franciscanus E. Snethlage, 1928 - E Brazil (São Francisco Valley in SW Bahia and N Minas Gerais, also Distrito Federal).



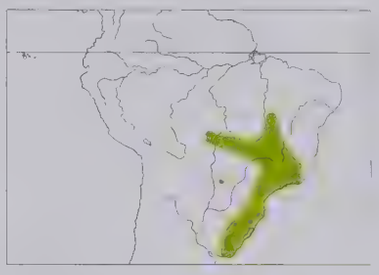
Descriptive notes. 16-18 cm. Male nominate race is shiny black overall, with large white band across inner webs of primaries (usually hidden at rest, conspicuous in flight); iris dark brown; bill blue-grey, black tip; legs black. Female is greyish-brown above, crown slightly darker, face and lores freckled or mottled whitish, two whitish-buff or cinnamon-buff wingbars, remiges edged rufous or whitish, rump and basal half of tail bright cinnamon-rufous, rest of tail dark brown with darker terminal band; buffy ochraceous below, strongest on chest, whiter on throat and mid-belly, bill black, lower mandible with bluish base. Races differ mainly in plumage of female: *anthracinus* male is duller black than nominate, female is smaller, with mottled dusky streaks on breast, less rufous on tail; *heterogyna* male is like previous, female is darker above and paler below, pale buff at base of tail; *franciscanus* smaller, female is whitish below, chest washed buffish and heavily streaked. Voice. A female-plumaged bird uttered "trrie rrhi rrhi, trrie rrhie rrhie, trrhie rrhit" while foraging near ground; also, a thin, wiry "chit-tzzzr"; migrants give faint "tseet". During male display, weak series of mechanical buzzing and clicking sounds, along with "toc-tek".
Habitat. Light scrub, woodland, and forest borders, mostly in arid regions. Race *anthracinus* in second growth on forest clearings and landslides, humid open shrubby forest; nominate race in dense thickets of thorny trees, riparian willow (*Salix*) thickets in arid zone. During migration occurs also in open brush on gravelly hillsides. Mostly 1500-3000 m, occasionally down to 250 m or as high as 3700 m.
Food and Feeding. Insects. Generally solitary, though usually not shy. Usually perches with erect posture in the open, occasionally inside canopy; flicks tail. Sallies from exposed branches or rocky outcrops, gleans from foliage, or drops to the ground.
Breeding. Oct-Feb; eggs in Oct-Nov and fledgling in Nov in Bolivia; display observed in Dec-Feb. Male displays with short flight upwards from perch, followed by stalling and plummeting backwards, then pulls out of dive back to perch, sometimes with faint vocalization; display can include clicking and buzzing at peak. Nest an open cup made of twigs, lined with feathers and hair, placed low in tree or bush, occasionally on ground; in Argentina, one nest elipse, 11 × 13 cm, height 4·5 cm, internal diameter 6·5 cm, depth 2·5 cm, another with external diameter 12 cm, internal diameter 6 cm, depth 3·5 cm. Clutch 2-3 eggs; no information on incubation and fledging periods. Male may apparently breed while still in immature plumage.
Movements. S race (nominate) moves N in Mar-Apr, returns in Nov; recorded during austral winter in Paraguay, e.g. in Teniente Enciso National Park and Chaco of Fortín General Díaz; recent record also from SC Brazil (W Mato Grosso do Sul). Possibly also performs some elevational movements.
Status and Conservation. Not globally threatened. Race *franciscanus* (sometimes treated as separate species) a Restricted-range taxon: present in Deciduous Forests of Minas Gerais and Goiás EBA. Fairly common to common; abundant in NW Argentina. Found typically in inhabited areas in montane basins, and occurs also in Madidi National Park, in Bolivia; in Machu Picchu Historical Sanctuary, in Peru, can be found all along the road from train station to the ruins.
Bibliography. Bornschein *et al.* (2003), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Cracraft (1985), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Flores & Capriles (1998), Friedmann (1927), Hayes (1995), Kirwan *et al.* (2004), Joseph (1996), de Lima (1999), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1988), Perry *et al.* (1997), Quiroga *et al.* (1998), Ridgely & Tudor (1994), Rocha & Quiroga (1996), Schulenberg *et al.* (2001), Short (1975), Sick (1993, 1997), da Silva & Oren (1992), Stotz *et al.* (1996), Straneck & Carrizo (1983), Walker (2001), Wetmore (1926), Willis & Oniki (1991).

274. Crested Black-tyrant

Knipolegus lophotes

French: Ada huppé **German**: Haubendunkeltyrann **Spanish**: Viudita Copetona

Taxonomy. *Knipolegus lophotes* Boie, 1828, São Paulo, Brazil.
Monotypic.
Distribution. S Brazil (S Mato Grosso E to W Bahia and Espírito Santo, S to Rio Grande do Sul), NE Paraguay (Cerro Amambay) and Uruguay.



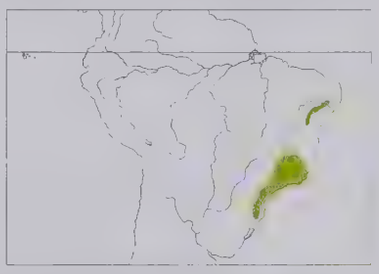
Descriptive notes. 20-21 cm. Large and conspicuously black-crested. Plumage is glossy blue-black, head with long, slender, pointed crest; base of remiges white (hidden or mostly so at rest, conspicuous in flight); iris dark red or reddish-brown; bill black; legs black. Sexes similar, female slightly smaller than male. Voice. Usually silent; night song reported to be modulated, ascending and descending notes with short trill, "dewéé-kwirr".
Habitat. Savannas, open grassy or shrubby areas, often near groves of trees; mostly below 1100 m.
Food and Feeding. Insects, occasionally small fruit; at one site in Minas Gerais, berries of *Miconia albicans* (Melastomataceae) were apparently an important component. Generally conspicuous, though usually in highly dispersed pairs. Sallies for prey.
Breeding. Little information. Apparently breeds Sept-Nov in Brazil. Two neighbouring territories in Minas Gerais were of 6·5 ha and 7·7 ha. Nest on small ledge, c. 3·5 m above ground level, in a damp, shaded, concealed site; open, circular nest made of twigs, roots and lichens.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Poorly known. Appears to have large home ranges. In Brazil, locally common below Itatiaia National Park, and occurs also in Caparaó and Serra da Canastra National Parks and Patrimônio Natural do Caraça Special Reserve.
Bibliography. Arballo (1990), Bauer & Pacheco (2000), Blake, E.R. (1953), Claramunt (1999), Cory & Hellmayr (1927), Cracraft (1985), Develey (2004), Dubs (1992), Forrester (1993), Hayes (1995), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Ribeiro *et al.* (2002), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Stotz *et al.* (1996), Venturini *et al.* (2001), Willis & Oniki (1990).

275. Velvety Black-tyrant

Knipolegus nigerrimus

French: Ada noir **German**: Kurzschopf-Dunkeltyrann **Spanish**: Viudita Aterciopelada

Taxonomy. *Muscicapa nigerrima* Vieillot, 1818, Brazil.
Two subspecies recognized.
Subspecies and Distribution.
K. n. hoflingi Lencioni, 1996 - NE Brazil, from W Pernambuco to C Bahia (Chapada Diamantina).
K. n. nigerrimus (Vieillot, 1818) - CE & SE Brazil, from Minas Gerais and Espírito Santo to Paraná and Rio Grande do Sul, including hills of Rio de Janeiro (Corcovado, Pico da Tijuca, Pico da Gavea).



Descriptive notes. 17·5-18 cm. Male plumage is glossy blue-black, head with small bushy crest; base of primaries white (hidden or mostly so at rest, conspicuous in flight); iris dark red; bill pale bluish-grey; legs black. Female is similar to male but lacks crest, and has throat chestnut, streaked black. Race *hoflingi* is somewhat smaller, with brown (not black) primaries, female with narrower throat patch. Voice. Unknown.
Habitat. Grassy or rocky areas, usually near trees or shrubby cover; mostly 1800-2700 m, locally down to 700 m.
Food and Feeding. Insects. Generally in pairs, and often conspicuous. Usually forages near ground, sallying for prey.
Breeding. No information. Believed to nest in burrows among rocks near streams.
Movements. Reportedly an altitudinal migrant during austral winter in Itatiaia; probably resident elsewhere.
Status and Conservation. Not globally threatened. Uncommon to fairly common, locally common. Common near the Corcovado Statue above Rio de Janeiro; numerous in high grasslands of Serra do Itatiaia. Poorly known. Occurs in Aparados da Serra, Caparaó, Itatiaia, Serra da Canastra and Tijuca National Parks, and in Patrimônio Natural do Caraça Special Reserve.
Bibliography. Bauer & Pacheco (2000), Cory & Hellmayr (1927), Cracraft (1985), Forrester (1993), Lencioni (1996), Meyer de Schauensee (1982), Pichorim *et al.* (1996), Ridgely & Tudor (1994), do Rosário (1996), Sick (1993, 1997), Souza (1999), Stotz *et al.* (1996), Teixeira *et al.* (1989).


PLATE 36
inches 3
cm 8
276
ssp albidiadema
ssp spodionota
277
ssp frontalis
278
ssp boliviana
279
ssp gratiosa
ssp diadema
280
ssp cinnamomeiventris
281
ssp angustifasciata
ssp thoracica
ssp nigrita
ssp poliogastra
ssp obfuscata
282
ssp rufipectoralis
ssp superciliosa
ssp fumicolor
283
ssp berlepschi
typical
Cochabamba
284
ssp oenanthoides
ssp polionota
285
ssp leucophrys
ssp leucometopa
286
287

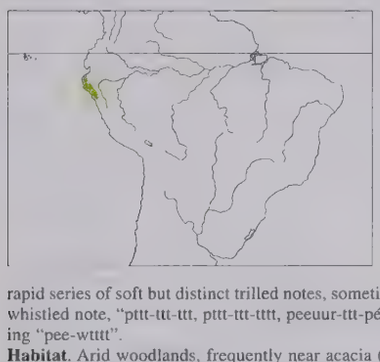
Genus *TUMBEZIA* Chapman, 1925

276. Tumbes Tyrant

Tumbezia salvini

French: Pitajo de Tumbes **German**: Gelbstirntyrann **Spanish**: Pitajo de Tumbes

Taxonomy. *Ochthoeca salvini* Taczanowski, 1877, Tumbes, Peru.
Affinities uncertain. Sometimes placed near similarly plumaged *Satrapa*; sometimes included in genus *Ochthoeca* on basis partly of similar syringeal characters, nesting habits and egg coloration. Monotypic.
Distribution. NW Peru, from Tumbes S to La Libertad.



Descriptive notes. 13·5 cm. Crown, lores and ear-coverts are dark grey; bold yellow frontal band and supercilium becoming paler and more whitish towards nape; generally grey or greyish-olive upperparts; wings dusky black, two broad white wingbars, secondaries and tertials edged white; tail blackish, outer rectrices edged white; throat and underparts entirely lemon-yellow; iris dark brown; bill short, black; legs black. Sexes alike. Voice. Call a mournful soft, somewhat musical, descending trill, "pitt-tit-tit-ttrrr" or "pttt-tiit-tiit-trrr-té", sometimes rising on final emphatic note; also a repeated "piit-tii-peeuur"; when excited, a repeated and rapid series of soft but distinct trilled notes, sometimes accentuated with higher-pitched and louder whistled note, "pttt-ttt-ttt, pttt-ttt-tttt, peeuur-ttt-péééü-pt-ttt-tttt-te" (Lambayeque); also, descending "pee-wtttt".
Habitat. Arid woodlands, frequently near acacia (*Acacia*) and mesquite (*Prosopis*) groves; often near dry watercourses. Usually below 200 m, locally at 540-800 m, and occasionally to 1000 m.
Food and Feeding. Insects. Frequently found in pairs. Fairly confiding. Perches at middle level, usually fairly erect, occasionally more horizontally; sometimes wags tail, with tail spread or fanned slightly. Often forages within 1-2 m of the ground, making short sallies to glean prey and to capture insects in air.
Breeding. No information.
Movements. Resident; occasional records at higher altitudes suggest possibly some seasonal elevational movement.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Tumbesian Region EBA. Uncommon; uncommon to fairly common in El Angolo Hunting Reserve (at 540-800 m), within the Northwest Biosphere Reserve. Has been recorded in about seven localities, all except aforementioned site unprotected, but may also occur in Cerros de Amotape National Park (also within Northwest Biosphere Reserve). These two protected areas are so far little threatened, with some subsistence logging, livestock grazing and agriculture around local settlements. Within remainder of Tumbesian region, however, forest and riparian and scrub habitats are being rapidly destroyed, degraded and fragmented as a result of timber extraction, livestock grazing and agricultural conversion, and it is feared that virtually all lowland forest outside protected areas will soon be eliminated.
Bibliography. Barrio (1997), Best & Kessler (1995), Clements & Shany (2001), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), García *et al.* (1998), Lanyon (1986a), Meyer de Schauensee (1982), Parker *et al.* (1996), Ridgely & Tudor (1994), Smith & Vuilleumier (1971), Stattersfield & Capper (2000), Stotz *et al.* (1996), Traylor (1977).

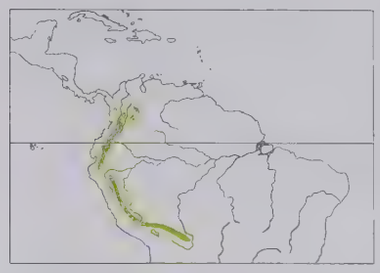
Genus *OCHTHOECA* Cabanis, 1847

277. Crowned Chat-tyrant

Ochthoeca frontalis

French: Pitajo couronné **German**: Kronenschmätzertyrann **Spanish**: Pitajo Coronado

Taxonomy. *Tyrannula frontalis* Lafresnaye, 1847, Pasto, Colombia.
Sometimes placed with *O. pulchella*, *O. diadema* and *O. jelskii* in a separate genus, *Silvicultrix*, but genetic and anatomical data indicate that this would make present genus paraphyletic. All four form a superspecies. *O. pulchella* and *O. jelskii* previously considered races of present species. Described race *orientalis* (from Ecuador) synonymized with nominate. Four subspecies recognized.
Subspecies and Distribution.
O. f. albidiadema (Lafresnaye,1848) - E Andes of Colombia (Bogotá).
O. f. frontalis (Lafresnaye, 1847) - W & C Andes of Colombia and both slopes in Ecuador.
O. f. boliviana Carriker, 1935 - Andes of C & S Peru (San Martín S to Huánuco, and Urubamba Valley in S Cuzco) and Bolivia (E slope from La Paz SE to Santa Cruz).
O. f. spodionota Berlepsch & Stolzmann, 1896 - Junín, W Cuzco (in Cordillera Vilcabamba) and adjoining Ayacucho, in C Peru.
Descriptive notes. 12·5-13 cm. Male nominate race has crown dark brown, bright yellow frontal band and long supercilium becoming white toward back of head; dark brown upperparts, dusky wings and tail with feathers edged dusky brown; throat whitish-grey, dark grey below, lower belly becoming whitish-grey, crissum and lower flanks dull cinnamon or dull rufous-buff; iris dark; bill black; legs black. Differs from *O. pulchella* in whiter supercilium, no wingbars, from *O. jelskii* in lack of rufous wingbars. Female has lighter crown, more extensive cinnamon-buff below. Juvenile is brighter overall, with brownish wash on flanks and belly, supercilium with buffy tinge, buffy wingbars.



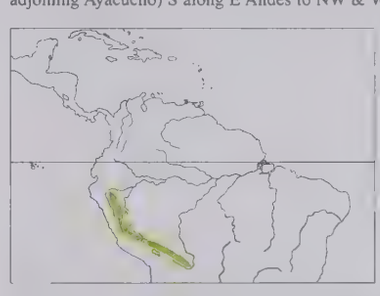
Race *albidiadema* has forehead and supercilium all white; *boliviana* is greyer above, crissum whitish, usually one or two rufous wingbars; *spodionota* is like previous but supercilium shorter. Voice. Usually silent; occasionally a thin, high-pitched, descending trill, "te-tirrrrrrrrrr," often lasting several seconds.
Habitat. Elfin forest, montane forest borders, and scrubby thickets, usually in elevational zone 100-200 m below tree-line; also *Polylepis* woodland (Ecuador) and in dead bamboo on mossy ground. At 2800-4000 m, occasionally down to 1600 m, rarely to 1300 m.
Food and Feeding. Insects. Usually solitary, and rarely with mixed-species flocks. Inconspicuous and easily overlooked, usually perching low to the ground in undergrowth. Sallies to foliage and branches for flying insects; often flits to mossy limbs and trunks, rather than to foliage.
Breeding. Fledglings in Sept in Colombia and Jan in Bolivia (Cochabamba); juveniles in Apr in NW Ecuador and Nov in Peru (Huánuco). Nest an open cup, placed in cavity on cliff, among roots projecting from bank, in *Espeletia* shrub or in bush. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Occurs in all Andean protected areas in Ecuador and Peru and in the La Paz and Cochabamba provinces in Bolivia.
Bibliography. Carriker (1935), Chapman (1917c, 1921), Clements & Shany (2001), Cory & Hellmayr (1927), Fitzpatrick (1973), Fjeldså & Krabbe (1990), García *et al.* (1998), Hennessey & Gómez (2003), Hilty (2003), Hilty & Brown (1986), Lanyon (1986a), Meyer de Schauensee (1982), Remsen (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996), Traylor (1985), Walker (2001).

278. Golden-browed Chat-tyrant

Ochthoeca pulchella

French: Pitajo à sourcils d'or **Spanish**: Pitajo Cejidorado
German: Gelbbrauen-Schmätzertyrann
Other common names: Yellow-browed Chat-tyrant

Taxonomy. *Ochthoeca pulchella* P. L. Sclater and Salvin, 1876, Tilotilo, Yungas of La Paz, Bolivia.
Sometimes placed with *O. frontalis*, *O. diadema* and *O. jelskii* in a separate genus, *Silvicultrix*, but genetic and anatomical data indicate that this would make present genus paraphyletic. All four form a superspecies. Formerly considered conspecific with *O. frontalis* and, later, with *O. jelskii*. Two subspecies recognized.
Subspecies and Distribution.
O. p. similis Carriker, 1933 - E Andes of Peru (S Amazonas S to Junín).
O. p. pulchella P. L. Sclater & Salvin, 1876 - S Peru (Cordillera Vilcabamba, in W Cuzco and adjoining Ayacucho) S along E Andes to NW & WC Bolivia.



Descriptive notes. 12 cm. Nominate race has dark grey-brown head and neck, darkest on crown, frontal band and long, narrow supercilium golden-yellow, paler behind eye; dark brown back, more rufescent on lower back and rump; wings and tail dark brown, two broad bright rufous wingbars; dark grey below, whiter on mid-belly, some rufous-buff on lower flanks, grey crissum; iris dark; bill black; legs black. Sexes alike. Juvenile has crown brown, buffy posterior supercilium, breast washed with olivaceous, belly and flanks ochraceous-buff. Race *similis* has ochraceous crissum. Differs from *O. jelskii* in having all-yellow supercilium, from *O. frontalis* also in rufous wingbars. Voice. Call a distinctive "te-tirrrr"; descending whine, "treeeee"; also "trrrr-rr-eeh-eh-errh-eehr-eeee", rising at end, or "trrr-rrr-rr-rrr-rrrr-eeee-rrr-rrr", especially at dawn. Occasionally clicks or snaps bill.
Habitat. Humid montane and scrubby forest borders; shady ravines, dark thickets, bamboo, and mossy forest. At 1700-2800 m.
Food and Feeding. Insects, including small beetles (Coleoptera). Usually occurs singly, occasionally in pairs, and most often not associated with mixed-species flocks. Often unobtrusive; perches low, flicks wings and tail. Sallies and gleans items, fluttering to strike prey from leaves or small branches; usually flies only short distances.
Breeding. Juvenile in Mar in Peru (Junín). No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common; probably often overlooked, as inconspicuous and not often seen. Present in all protected areas in its range, e.g. Machu Picchu Historical Sanctuary, in Peru, and Madidi National Park, in Bolivia.
Bibliography. Clements & Shany (2001), Cory & Hellmayr (1927), Davies *et al.* (1994), Fitzpatrick (1973), Fjeldså & Krabbe (1990), García *et al.* (1998), Hennessey & Gómez (2003), Hennessey, Herzog & Sagot (2003), Hinojosa *et al.* (1998), Koepcke (1970), Lanyon (1986a), Meyer de Schauensee (1982), Remsen (1985), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1985), Walker (2001), Zimmer (1937a).

279. Yellow-bellied Chat-tyrant

Ochthoeca diadema

French: Pitajo diadème **German**: Gelbbauch-Schmätzertyrann **Spanish**: Pitajo Diademado

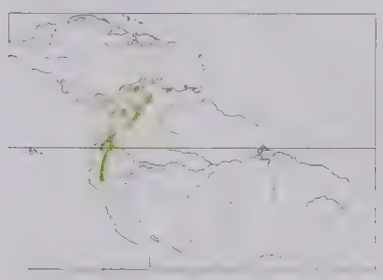
Taxonomy. *Myiobius diadema* Hartlaub, 1843, Bogotá, Colombia.

On following pages: 280. Jelski's Chat-tyrant (*Ochthoeca jelskii*); 281. Slaty-backed Chat-tyrant (*Ochthoeca cinnamomeiventris*); 282. Rufous-breasted Chat-tyrant (*Ochthoeca rufipectoralis*); 283. Brown-backed Chat-tyrant (*Ochthoeca fumicolor*); 284. D'Orbigny's Chat-tyrant (*Ochthoeca oenanthoides*); 285. White-browed Chat-tyrant (*Ochthoeca leucophrys*); 286. Piura Chat-tyrant (*Ochthoeca piurae*); 287. Patagonian Tyrant (*Colorhamphus parvirostris*).

Sometimes placed with *O. frontalis*, *O. pulchella* and *O. jelskii* in a separate genus, *Silvicultrix*, but genetic and anatomical data indicate that this would make present genus paraphyletic. All four form a superspecies. Described race *meridana* (from Mérida, in Venezuela) considered indistinguishable from nominate; *cajamarcae* (from Cajamarca, in Peru) synonymized with *gratiosa*. Five subspecies recognized.

Subspecies and Distribution.

O. d. jesupi J. A. Allen, 1900 - Santa Marta Mts, in N Colombia.
O. d. rubellula Wetmore, 1946 - Sierra de Perijá, on Colombia-Venezuela border.
O. d. tovarensis Gilliard, 1940 - coastal range in N Venezuela (Aragua, Distrito Federal).
O. d. diadema (Hartlaub, 1843) - E Andes in W Venezuela and Colombia.
O. d. gratiosa (P. L. Sclater, 1862) - W & C Andes and W slope of E Andes of Colombia S to N Peru (Piura, Cajamarca).



Descriptive notes. 12-12·5 cm. Large-headed appearance, long rictal bristles. Nominate race has crown dark olive, yellow forehead and long supercilium becoming narrower and paler behind eye, lores blackish; upperparts olivaceous or brownish-olive, wings and tail dusky; yellow-olive below, light yellow on throat and belly, more olive on breast; iris dark brown, bill and legs black. Sexes alike. Juvenile has supercilium tinged ochraceous posteriorly, rufous wash on back, ochraceous vent. Race *jesupi* is virtually indistinguishable from nominate in field; *tovarensis* is also similar, but brighter yellow wash below; *gratiosa* has upperwing-coverts tipped dull rufous, flight-feathers edged rufous; *rubellula* has rufescent brown back and broad rufous edgings on wings. Voice. Call an accelerating trill, ending with separate lower note; song a thin rapid trill, e.g. "chiiiiiaaaaaiiiii", also much longer trill, c. 4-4·5 seconds, that slowly rises before dropping slightly at end; dawn song a fast, ascending trill, "prrrreeee" or "preeeeeee'sku`u`u`u", repeated at intervals of several seconds.

Habitat. Dense interior and undergrowth of humid montane forest, less often along shrubby forest borders near streams; generally not found in areas with bamboo. Mostly 1700-3100 m, rarely down to 800-900 m.

Food and Feeding. Insects, mostly small beetles (Coleoptera). Generally inconspicuous and infrequently seen; usually in pairs in dense undergrowth close to ground; sometimes forages near mixed flocks, but usually not joining them. Perches fairly erect, usually up to 5 m above ground in mossy understorey; frequent wing-flicking and tail-flicking, and aggressive behaviour. Frequently sallies, and gleans from low foliage or near ground, usually taking prey from foliage with audible snap of mandibles; items occasionally taken from twigs or the ground.

Breeding. Jan-Oct in Colombia and Mar-Dec in Ecuador. Nest details unclear, but reported as a mossy cup placed on bank. Clutch 4 eggs. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to locally fairly common; inconspicuous and often overlooked, possibly more common than it appears to be. Occurs in all protected areas in Andes of Ecuador except Cajas; also found in Sierra Nevada National Park, in Venezuela, and many localities in Colombia, e.g. Tambito Nature Reserve and Cueva de los Guácharos National Park.

Bibliography. Allen (1998), Baez *et al.* (1997), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fitzpatrick (1973), Fjeldså & Krabbe (1990), García *et al.* (1998), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Sclater & Salvin (1879), Stotz *et al.* (1996), Traylor (1985), Williams & Tobias (1994).

280. Jelski's Chat-tyrant

Ochthoeca jelskii

French: Pitajo de Jelski **German**: Rostbürzel-Schmätzertyrann **Spanish**: Pitajo de Jelski

Taxonomy. *Ochthoeca jelskii* Taczanowski, 1883, Montaña de Nancho, Peru.

Sometimes placed with *O. frontalis*, *O. pulchella* and *O. diadema* in a separate genus, *Silvicultrix*, but genetic and anatomical data indicate that this would make present genus paraphyletic. All four form a superspecies. Formerly considered conspecific with *O. frontalis* and, later, with *O. pulchella*; possibly closest to former. Monotypic.

Distribution. SW Ecuador and NW Peru (S to Lima, in La Libertad crossing to E side of R Marañón W of C Andes).



Descriptive notes. 12-12·5 cm. Male has blackish-brown head, yellow frontal area and white supercilium; upperparts more rufous-brown than head; wings dusky, two strong rufous wingbars; tail dusky or brownish; grey below, paler belly tinged pale rufous, buffy crissum; iris dark; bill black; legs black. Differs from *O. frontalis* in having prominent rufous wingbars, and plumage generally browner above and paler grey below; from *O. pulchella* in white (not yellow) supercilium. Female is buffier below, especially on lower belly. Voice. Usually quiet; song a high-pitched and sharp "tseeeee", sometimes varied to "tseee-krrrr" or "tse-tsirrekerrr".

Habitat. Borders of montane forest and secondary woodland and adjacent shrubby stream borders; 1300-3400 m, generally at higher elevations towards S of range.

Food and Feeding. Insects. Usually found singly; occasionally follows mixed-species flocks. Usually sallies from low perch in vegetation, occasionally from ground.

Breeding. No information.

Movements. Resident.

Status and Conservation. Not globally threatened. Rare to uncommon and local; often overlooked, possibly more common. In Ecuador, appears more abundant in Sozoranga, Cariamanga and Utuana regions than elsewhere, e.g. fairly common near Utuana (Loja) in "Bosque de Hanne" Forest Reserve, which was recently afforded protection by Fundación Arcoiris and Fundación Jocotoco. Occurs also along entrance road at W edge of Podocarpus National Park, in Ecuador, and in Cutervo, in NW Peru.

Bibliography. Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fitzpatrick (1973), Fjeldså & Krabbe (1990), García *et al.* (1998), Koepcke (1970), Lanyon (1986a), Rasmussen *et al.* (1996), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Traylor (1985), Zimmer (1937a).

281. Slaty-backed Chat-tyrant

Ochthoeca cinnamomeiventris

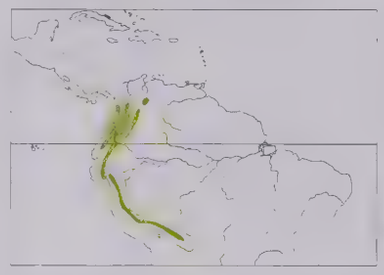
French: Pitajo noir **German**: Schiefermantel-Schmätzertyrann **Spanish**: Pitajo Negro
Other common names: Blackish Chat-tyrant (*nigrita*); Chestnut-belted/Maroon-belted Chat-tyrant (*angustifasciata* and *thoracica*)

Taxonomy. *Muscicapa cinnamomeiventris* Lafresnaye, 1843, Colombia, restricted to "Bogotá".

N race *nigrita*, nominate and S races (*angustifasciata* and *thoracica*) sometimes treated as three separate species, differing in plumage and vocalizations, apparently also with genetic differences between nominate and S races; treatment as conspecific based largely on constancy of plumage pattern. Further research required. Four subspecies recognized.

Subspecies and Distribution.

O. c. nigrita P. L. Sclater & Salvin, 1871 - Andes of Venezuela (Mérida, Táchira).
O. c. cinnamomeiventris (Lafresnaye, 1843) - Andes of SW Venezuela (W Táchira) and Colombia (from Antioquia and Santander) S to Ecuador (on W slope S to Chimborazo) and extreme N Peru.
O. c. angustifasciata Chapman 1926 - N Peru, from S Amazonas S to R Marañón, also E Cajamarca S to SW San Martín.
O. c. thoracica Taczanowski, 1874 - C & SE Peru (S from Pasco) S to N Bolivia (S to Cochabamba).



Descriptive notes. 12-13 cm; 11·9 g. Small and short-tailed, with short, thin bill, long rictal bristles. Nominate race has largely slaty or blackish head, short white supercilium; upperparts largely slaty or blackish-grey, wings perhaps slightly brown-tinged; tail narrow, blackish; throat and upper chest blackish, breast and belly deep chestnut, lower belly and crissum blackish; iris, bill and legs black. Sexes alike. Juvenile resembles adult. Races vary mainly in underpart coloration: *nigrita* has no chestnut below; in *thoracica* supercilium does not reach base of bill, wide band of deep chestnut across chest; *angustifasciata* is similar but with somewhat narrower chestband. Voice. Persistent and loud calls often audible above rushing torrents; common vocalization a sharp "dzzweee-yew", often repeated, also high-pitched "chew"; dawn song consists of same note followed by 3-4 "tseet" notes. Call of *thoracica* higher-pitched "tseeeeeyeeee", reminiscent of a *Pipreola* fruiteater; *nigrita* infrequently gives rather loud, buzzy, slightly descending whistle.

Habitat. Montane forest and edge and second growth, most often in shrubs and other dense vegetation in stream ravines; 1600-3000 m, locally to 3300 m, rarely down to 900 m.

Food and Feeding. Insects. Usually singly or in close pair, notably sedentary; does not accompany mixed-species flocks. Perches upright and low in edge of dense or shady understorey vegetation, usually by streams; inconspicuous (because of dark plumage), but voice often betrays its presence. Sallies, usually a short distance, and gleans, frequently returning to same perch.

Breeding. Jan-Aug in Colombia, where eggs in Feb (Huila) and juveniles Feb-Aug and birds with enlarged gonads in Oct (Boyaca); Feb-Aug in Peru, fledglings in Mar (Junín). Nest a mossy cup, placed among roots in crevice, bank, cliff or occasionally bush. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Fairly common. Very numerous in vicinity of Cerro Las Copas, in Venezuela. Occurs in all national parks in Andes of Ecuador; probably also in all national parks and other reserves in its range in Peru and Bolivia, e.g. Finca Merenberg, Tambito Nature Reserve and Cueva de los Guácharos National Park, all in Colombia, Guandera Biological Reserve and Podocarpus National Park, both in Ecuador, and Madidi National Park, in Bolivia.

Bibliography. Baez *et al.* (1997), Chapman (1917c), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Fitzpatrick (1973), Fjeldså & Krabbe (1990), García *et al.* (1998), Hilty (2003), Hilty & Brown (1986), Krabbe *et al.* (1997), Lanyon (1986a), Meyer de Schauensee (1982), Olivares (1971), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Sclater & Salvin (1879), Stotz *et al.* (1996), Walker (2001), Williams & Tobias (1994), Zimmer (1937a).

282. Rufous-breasted Chat-tyrant

Ochthoeca rufipectoralis

French: Pitajo à poitrine rousse **Spanish**: Pitajo Pechirrufo
German: Orangebrust-Schmätzertyrann

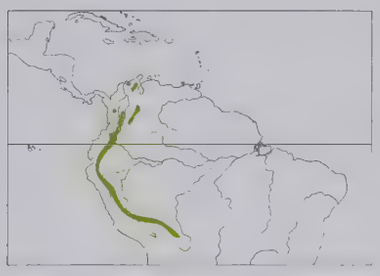
Taxonomy. *F[luvicola] rufi-pectoralis* d'Orbigny and Lafresnaye, 1837, Ayopayo, Cochabamba, Bolivia.

Taxonomy within this species uncertain, owing to isolation of Andean valleys in which races occur, and inadequate documentation of extent and frequency of intermediates; in S of range, variation from *centralis* to *tectricialis* and nominate apparently clinal; current treatment maintained pending further study. Seven subspecies recognized.

Subspecies and Distribution.

O. r. poliogastra Salvin & Godman, 1880 - Santa Marta Mts, in N Colombia.
O. r. rubicundula Wetmore, 1946 - Sierra de Perijá, on Colombia-Venezuela border.
O. r. rufopectus (Lesson, 1844) - E Andes of Colombia.
O. r. obfuscata J. T. Zimmer, 1942 - C & W Andes of Colombia S to N Peru (Piura, Cajamarca, Amazonas, possibly NW San Martín).
O. r. centralis Hellmayr, 1927 - NC Peru (S La Libertad, Ancash, Huánuco).
O. r. tectricialis Chapman, 1921 - SC Peru (Pasco S to Cuzco).
O. r. rufipectoralis (d'Orbigny & Lafresnaye, 1837) - SE Peru (Cuzco, N Puno) and W Bolivia (La Paz, Cochabamba).

Descriptive notes. 13-14 cm; 13 g. Distinctive. Nominate race has head sooty brown, conspicuous white frontal band and long broad supercilium; upperparts brown or sooty brown; wings and tail blackish, faint rufous or cinnamon-buff edgings on tertials and secondaries, outermost rectrices narrowly edged white; chin and throat greyish, lower throat and chest dark orange-rufous, belly white; iris dark brown; bill short, thin, black; legs black. Sexes alike. Juvenile is similar to adult. Races vary mainly in wing markings, also coloration of underparts: *obfuscata* has rufous wingbar



(occasionally two), pale edges of tertials more prominent; *centralis* is like previous, chestband darker; *tectricialis* is variable, largely intermediate between previous and nominate in respective contact zones; *poliogastra* has crown brown, hardly differing from back, broad rufous on wing, narrow and paler breastband, greyer below; *rubicundula* and *rufipectus* both very similar to last. Voice. Song an abrupt "tjrt-tjrrrrt-tjt-trrrt", "chic-chic-chica" or "ch-brrr, ch-brrr, ch-brrr", usually doubled; also, faint "cleeoo" and rapid series of "pt" notes ending with two "cleeoo" notes; dawn song "tirip, wee-eeuww, tirip, weeeeuw" and so on; some trilled vocalizations recall voice of Neblina Tapaculo (*Scytalopus altirostris*). Occasionally gives clucking sound. Wings produce whirring sound.

Habitat. Borders of open cloudforest and humid montane and *Polylepis* forests, often along roads; occasionally stunted forest and shrubby slopes near tree-line, and riparian thickets in semi-arid zone. Mostly 2000-3600 m, rarely to 4100 m.

Food and Feeding. Insects. Usually found singly or in pairs, and sometimes accompanies mixed flocks; often highly territorial. Perches conspicuously in alert and upright manner, usually less so when actively foraging; frequently jerks, appearing perky. Makes short sallies into air, though more frequently to foliage where adroitly hover-gleans prey mostly from upper leaf surfaces.

Breeding. Jan-Sept in Colombia; juvenile in Apr in Ecuador; nest in Oct (Puno) and juvenile in Nov (Huánuco) in Peru. Nest a moss cup on rock ledge, often sheltered by stunted trees. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Fairly common. In Ecuador, less abundant on W Andean slopes than on E ones. Occurs in most national parks within its range, but not in wettest zones; present in e.g. Guandera Biological Reserve, Podocarpus National Park and Utuana forests (recently protected by Fundación Arcoiris and Fundación Jocotoco), all in Ecuador, Machu Picchu Historical Sanctuary, in Peru, and Madidi National Park, in Bolivia.

Bibliography. Baez *et al.* (1997), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Davies *et al.* (1994), Fitzpatrick (1973), Fjeldså & Krabbe (1990), García *et al.* (1998), Hennessey, Herzog & Sagot (2003), Hilty (2003), Hilty & Brown (1986), Hinojosa *et al.* (1998), Meyer de Schauensee (1982), Moynihan (1979), Remsen (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Schulenberg & Servat (2001), Stotz *et al.* (1996), Todd & Carriker (1922), Walker (2001), Williams & Tobias (1994), Zimmer (1930, 1937a).

283. Brown-backed Chat-tyrant

Ochthoeca fumicolor

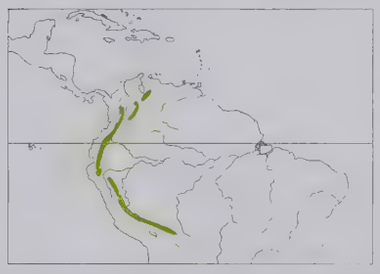
French: Pitajo à dos brun **German**: Fahlbrauen-Schmätzertyrann **Spanish**: Pitajo Dorsipardo

Taxonomy. *Ochthoeca fumicolor* P. L. Sclater, 1856, Bogotá, Colombia.

It has been suggested that brighter race *superciliosa*, occurring adjacent to dark nominate race (but apparently separated by Táchira Depression), may be a separate species. Birds from Cochabamba may represent a separate race, as yet undescribed. Five subspecies currently recognized.

Subspecies and Distribution.

O. f. superciliosa P. L. Sclater & Salvin, 1871 - Andes of W Venezuela (Trujillo, Mérida, E Táchira).
O. f. fumicolor P. L. Sclater, 1856 - Andes of SW Venezuela (S Táchira) and N part of E cordillera in Colombia.
O. f. ferruginea J. T. Zimmer, 1937 - N part of C & W Andes of Colombia.
O. f. brunneifrons Berlepsch & Stolzmann, 1896 - C & W Andes of Colombia S to N & C Peru.
O. f. berlepschi Hellmayr, 1914 - SE Peru (Cuzco, Puno) and W & C Bolivia (La Paz, Cochabamba).



Descriptive notes. 14·5-16 cm; 17 g. Flat-headed appearance. Nominate race has frontal area and supercilium whitish, becoming more ochraceous behind eye; crown warm brown; back rufescent brown, becoming more rufous-brown towards rump; wings dusky or blackish, two prominent rufous wingbars, lower one more conspicuous; tail dusky to blackish, white outer webs of outer rectrices; throat and lower face greyish; underparts cinnamon-rufous, crissum buff; iris dark; bill black; legs black. Female is somewhat paler below. Juvenile is warmer brown, lacks grey on chin. Races vary mainly in cinnamon tones of breast and supercilium: *superciliosa* is brightest, with rufous supercilium and breast, fading to buff on belly centre; *brunneifrons* has long, conspicuous buff supercilium, strong wingbars; *berlepschi* has rather short, narrow, dirty whitish supercilium, birds from Cochabamba have browner crown; *ferruginea* resembles previous but more white in outer tail. Voice. Usually quiet, but call a high-pitched "tsiu"or soft "prip"; clear whistled "kleeeip" when foraging or perched; at dawn, partners sing a rhythmic duet "plee, pliter'ter, phl'ter'tew", chattery, up to 12 phrases, slowing at end; when excited a sharp "keek-kee-keek" or "keek-tede-keek" repeated from perch, or sometimes at night with accompanying wing-whirring.

Habitat. Shrub-bordered pastures, montane forest and semi-humid *Polylepis* woodland at or above tree-line, and open *páramo* with *Espeletia*. At 2200-4200 m, rarely down to 1800 m and up to 4400 m.

Food and Feeding. Insects. Usually singly, or pair-members widely scattered; often territorial. Perches on thick branches, usually near main stem, or clings to main stem, also prominent perches on bushtops and fence posts; generally conspicuous, often confiding. Sallies varying distances to ground, foliage or air, sometimes returning to same perch sometimes changing perch and moving considerable distance; occasionally hover-gleans; spreads wings and tail widely and for long periods upon landing.

Breeding. Season Feb-Sept in C & E Andes of Colombia, and nest in Dec (Boyaca); nest and eggs in Mar in Venezuela; moult (presumed post-breeding) in Nov in Peru (Huanuco) and Jan in Bolivia (Cochabamba). During territorial disputes makes short wobbling flights and wing-whirring. Nest a fur-lined cup, placed low down in *Espeletia* shrub. No other information.

Movements. Resident; some seasonal or local altitudinal movement suspected because of records at lower elevations.

Status and Conservation. Not globally threatened. Fairly common to common. Occurs in all national parks at appropriate elevations in Colombia and Ecuador (except Cotacachi-Cayapas), Río Abiseo National Park in N Peru, and all national parks in S Peru and in La Paz and Cochabamba provinces in Bolivia.

Bibliography. Baez *et al.* (1997), Butler (1979), Chapman (1917c, 1921), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fitzpatrick (1973), Fjeldså & Krabbe (1990), García *et al.* (1998), Hilty (2003), Hilty & Brown (1986), Kessler & Herzog (1998), Koepcke (1970), Meyer de Schauensee (1982), Olivares (1963), Remsen (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Schulenberg & Servat (2001), Sclater & Salvin (1879), Smith & Vuilleumier (1971), Stotz *et al.* (1996), Varty *et al.* (1986), Vuilleumier & Ewert (1978), Walker (2001), Williams & Tobias (1994), Zimmer (1930, 1937a).

284. D'Orbigny's Chat-tyrant

Ochthoeca oenanthoides

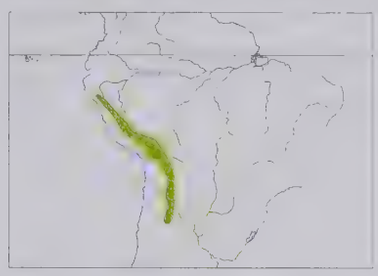
French: Pitajo d'Orbigny **German**: Graurücken-Schmätzertyrann **Spanish**: Pitajo Canela

Taxonomy. *F[luvicola] OEnanthoides* d'Orbigny and Lafresnaye, 1837, La Paz, Bolivia.

Races overlap, with birds tending to exhibit intermediate characters, in extreme S Peru and N Chile. Two subspecies recognized.

Subspecies and Distribution.

O. o. polionota P. L. Sclater & Salvin, 1870 - Peru (from La Libertad S along W Andes to Cuzco and N Puno) and extreme N Chile (Arica).
O. o. oenanthoides (d'Orbigny & Lafresnaye, 1837) - S Peru (Titicaca Basin, in Tacna), N Chile (Arica), W Bolivia (S from La Paz) and NW Argentina (S to La Rioja).



Descriptive notes. 14·5-17 cm. Nominate race has white frontal band and very long, broad whitish-buff supercilium; crown greyish or greyish-brown, blackish mask; upperparts greyish-brown or greyish; wings and tail duskier, weak greyish-cinnamon wingbar, tertials edged greyish-cinnamon, secondaries narrowly edged white, outer web of outermost rectrix white; throat greyish, chest dusky cinnamon, becoming deep cinnamon on lower belly, vent white or greyish-white; iris dark brown; bill black; legs black. Differs from *O. fumicolor* in having less distinct wingbars, generally paler above, whiter supercilium, paler throat. Sexes alike. Juvenile has supercilium creamy white. Race *polionota* is generally darker, sooty grey above, with brighter white supercilium and blacker mask, weaker wingbars, darker underparts, vent washed cinnamon. Voice. Usually not very vocal; song a rhythmical loud "reek a teek a reek a teek a" lasting 1-3 seconds, and often gives excited song-like notes; call a sharp "kvee"; contact note "chit" or "chic-chit", repeated at intervals of 3-5 seconds.

Habitat. Arid montane forest and woodlands (e.g. *Puya*, *Gynoxys* and *Polylepis*), often on slopes and in ravines and near rushing streams; also on rocky slopes with bunch-grass and very scattered bushes and fence posts; usually tied to woodland. At 2800-4500 m; locally down to 2000 m (Argentina).

Food and Feeding. Insects. Usually alone or in pairs. Perches upright and conspicuously on dead branches, bushtops or fence posts; flies down to take insects from the ground, often returning to same perch.

Breeding. In Bolivia, eggs and fledglings in Dec (La Paz) and juveniles in Jan (La Paz), Nov (Cochabamba) and Feb (Chuquisaca); pair feeding two chicks in Feb in Argentina. Nest an open cup placed in cavity on cliff. No further information.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to fairly common. Occurs in Machu Picchu Historical Sanctuary and Huascarán National Park, in Peru, Madidi National Park, in Bolivia, and Los Cardones National Park, in Argentina.

Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chapman (1921), Clements & Shany (2001), Cory & Hellmayr (1927), Fitzpatrick (1973), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Flores & Capriles (1998), García *et al.* (1998), Jaramillo (2003), Johnson (1967), Koepcke (1970), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Ordano (1998a), de la Peña (1988), Quiroga *et al.* (1998), Ridgely & Tudor (1994), Rocha & Peñaranda (1995), Rocha & Quiroga (1998), Stotz *et al.* (1996), Walker (2001), Zimmer (1930, 1937a).

285. White-browed Chat-tyrant

Ochthoeca leucophrys

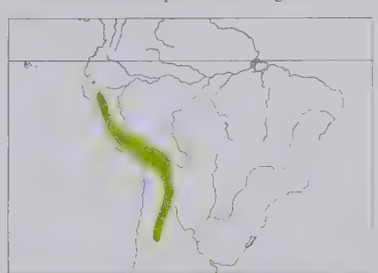
French: Pitajo à sourcils blancs **German**: Graubauch-Schmätzertyrann **Spanish**: Pitajo Gris

Taxonomy. *F[luvicola] leucophrys* d'Orbigny and Lafresnaye, 1837, Sicasica, La Paz, Bolivia.

Probably forms a superspecies with *O. piurae*, and these two are sometimes considered conspecific. Race *urubambae* possibly better merged with *interior*. Six subspecies currently recognized.

Subspecies and Distribution.

O. l. dissors J. T. Zimmer, 1940 - extreme S Ecuador and N Peru (upper Marañón Valley).
O. l. interior J. T. Zimmer, 1930 - highlands of C Peru (Huánuco, Pasco).
O. l. urubambae J. T. Zimmer, 1937 - highlands of C & S Peru (Junín S to NE Ayacucho and Cuzco).
O. l. leucometopa P. L. Sclater & Salvin, 1877 - W Peru (Ancash) S to N Chile (Arica, Tarapacá).
O. l. leucophrys (d'Orbigny & Lafresnaye, 1837) - highlands of Bolivia.
O. l. tucumana Berlepsch, 1906 - highlands of NW Argentina (Salta S to San Juan).



Descriptive notes. 14·5-15 cm. Overall the greyest chat-tyrant. Nominate race has conspicuous white frontal area and long and broad supercilium; blackish mask, dark grey or greyish-brown crown; upperparts slightly paler than crown, faint cinnamon tinge on lower back and rump; wings duskier, two indistinct cinnamon wingbars; tail dusky, outer web of outermost rectrices white; pale grey below, paler on belly, crissum whitish; iris dark; bill black; legs black. Sexes alike. Juvenile tinged brownish, with conspicuous wingbars. Race *tucumana* differs from nominate in more distinct cinnamon on wings, lower back and rump, slightly paler grey below; *leucometopa* is darker above, no cinnamon,

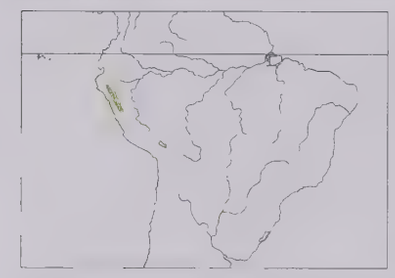
remiges edged whitish; *urubambae* resembles previous, but slightly less dark on crown; *interior* is on average slightly darker above than previous; *dissors* is similar to last, but not quite so dark.
Voice. Vocalizes frequently; call a piercing "queeuw", sometimes "keeu keukeukeukeu" in flight; "tee teeti" when alarmed.
Habitat. Arid montane forest, *Polylepis* woodland and shrubby stream borders, especially ravines, gorges or slopes with grasses and herbs; often found near water. Mainly 2000-3500 m, locally down to sea-level; occasionally to 4000 m in Peru.
Food and Feeding. Insects. Usually singly or in pairs. Usually conspicuous, with slender though upright posture; often jerks or flicks wings and tail. Sallies for insects from top of low bushes and herbs, returning to prominent perch, or from the ground.
Breeding. Probably Oct-Jan in Peru; Nov-Feb in Argentina. Nest found in Argentina, an open cup made of small twigs, lined with feathers (probably from bird itself), white hairs and tiny bits of wool, external diameter 11 cm, height 8 cm, internal diameter 6 cm, depth 6 cm; concealed within grass clump 1·7 m above small stream on side of ravine; contained 1 egg. No other information available.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Occurs in Machu Picchu Historical Sanctuary and Huascarán National Park, in Peru, and Madidi National Park, in Bolivia.
Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chapman (1921), Clements & Shany (2001), Cory & Hellmayr (1927), Fitzpatrick (1973), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Flores & Capriles (1998), García *et al.* (1998), Jaramillo (2003), Johnson (1967), Koepcke (1970), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Walker (2001), Zimmer (1930, 1937a).

286. **Piura Chat-tyrant**

Ochthoeca piurae

French: Pitajo de Piura **German**: Buntflügel-Schmätzertyrann **Spanish**: Pitajo de Piura

Taxonomy. *Ochthoeca piurae* Chapman, 1924, Piura, Peru.
Probably forms a superspecies with *O. leucophrys*, and sometimes considered conspecific. Monotypic.
Distribution. W slope of W Andes from Piura S to Ancash, in NW Peru.



Descriptive notes. 12 -12·5 cm. Has crown and face dark brown, conspicuous white frontal band and long supercilium; back brown, lower back and rump dusky brown; wings duskier blackish, two broad rufous wingbars, white edges of tertials and secondaries; tail dusky brown, outer web of outer rectrices edged white; throat white or whitish, breast and upper belly greyish, lower belly and vent whitish-grey, crissum white; iris dark brown; bill black; legs black. Differs from *O. leucophrys* in much smaller size. Sexes alike. Juvenile undescribed. Voice. Call a thin "tchiitt", sometimes extended into soft, descending trill lasting 1-3 seconds "tchiitt-chtt-t-t-t-t-t-t-t-t" (Lambayeque).
Habitat. Arid montane-forest edge and hillside scrub and riparian thickets, at 1200-3300 m.
Food and Feeding. Unknown. Diet presumably insects. Usually singly or in pairs.
Breeding. Unknown.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Tumbesian Region EBA. Recorded at five localities in NW Peru: Palambla (in Piura), Porculla (Lambayeque), Samne (La Libertad), and Colcabamba and San Damián (Ancash). Small numbers can be found along W side of Porculla Pass road. At present, no protected areas exist within this species' very small range; continuing habitat clearance and degradation of montane scrub and riparian thickets, in conjunction with overgrazing, probably represent the main current threats.
Bibliography. Best & Kessler (1995), Clements & Shany (2001), Collar *et al.* (1994), Cory & Hellmayr (1927), Fitzpatrick (1973), Fjeldså & Krabbe (1990), Meyer de Schauensee (1982), Parker *et al.* (1996), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996), Zimmer (1937a).

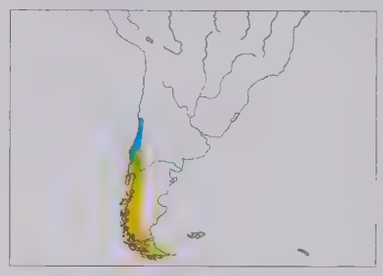
Genus *COLORHAMPHUS* Sundevall, 1872

287. **Patagonian Tyrant**

Colorhamphus parvirostris

French: Pitajo de Patagonie **German**: Patagonienschmätzertyrann **Spanish**: Peutrén
Other common names: Patagonian Chat-tyrant, Small-billed Tyrant

Taxonomy. *Myiobius parvirostris* Darwin, 1839, Santa Cruz, Chile.
Genus sometimes merged with *Ochthoeca*, to which appears most closely related according to morphological data. Formerly considered by some to be related to *Mecocerculus* or *Elaenia*. Monotypic.
Distribution. Breeds from SC Chile (from La Araucanía) and SW Argentina (from Neuquén and Río Negro) S to Tierra del Fuego; N to C Chile (Coquimbo) in non-breeding season.



Descriptive notes. 12-12·5 cm. Has head darkish grey with median band on crown blackish-grey fading to brownish-grey towards rear; rest of head medium grey, with slightly paler, whitish narrow eyering, blackish-grey ear patch; upperparts brownish-grey, more brownish on lower back and rump; wings and tail dusky brown, one or two cinnamon or cinnamon-rufous wingbars, secondaries narrowly edged rufous; throat and breast grey, gradually becoming buffy whitish on upper belly and whiter on lower belly, crissum buffy white or whitish; iris dark; bill short, black; legs black. Sexes alike. Juvenile is more rufous above without dark cap, darker below, abdomen more ochraceous. Voice. Distinctive call, frequent in breeding season, occasional at other times, a drawn-out, high, quavering and rather melancholy "pseeeuww"; song a long, high-pitched sibilant "seee".
Habitat. Borders of humid forest, including *Nothofagus*, *Quillaja saponaria* and *Maitenus boaria*, and shrubby openings; below 1000 m.
Food and Feeding. Insects. Frequently found singly or in pairs; generally inconspicuous; usually perches upright. Forages at varying levels, usually in treetops or quite high above ground during nesting period, generally lower (from low perches on herbs or bushes) in non-breeding season. Sallies for passing insects.
Breeding. Nov-Feb in Chile and Oct-Feb in Argentina. Nest cup-shaped, consisting of grass and moss, frequently attached to bamboo stem, usually low to ground inside *Nothofagus* forest; in Argentina, one nest had external diameter 13 cm, height 15 cm, internal diameter 5·1 cm, depth 3·5 cm, placed 4 m above ground in tree (hidden by leaves), another 1·5 cm from ground, with total diameter 11 cm, height 6 cm, internal diameter 6 cm, depth 3 cm. Clutch 3 eggs. No information on incubation and fledging periods.
Movements. Austral migrant. Post-breeding movement N, to as far as C Chile (Coquimbo); leaves breeding grounds in Mar, returns in Oct.
Status and Conservation. Not globally threatened. Rare to uncommon. Abundance decreases in extreme S parts of range. Occurs in all national parks within Chilean fjordlands, e.g. Puyehué National Park.
Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Casas *et al.* (1990), Chesser & Marín (1994), Clark (1986), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Cracraft (1985), Fjeldså & Krabbe (1990), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967), Joseph (1996), Marín (2004), Marín *et al.* (1989), Meyer de Schauensee (1982), Narosky & Salvador (1998), de la Peña (1988), Ridgely & Tudor (1994), Saibene (1988), Stotz *et al.* (1996), Vuilleumier (1985), Wetmore (1926).

PLATE 37 ➤



PLATE 37

inches 3
cm 8

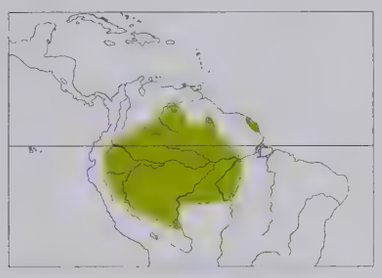
Genus *OCHTHORNIS* P. L. Sclater, 1888

288. Drab Water-tyrant

Ochthornis littoralis

French: Moucherolle riverain **German**: Weißbrauentyrann **Spanish**: Mosquerito Guardarríos

Taxonomy. *Elainea littoralis* Pelzeln, 1868, Borba, Rio Madeira, Brazil.
Genus merged with *Ochthoeca* by some authors, but separate generic status supported by morphological and anatomical evidence and differences in behaviour and habitat. Monotypic.
Distribution. Amazonian S Colombia, S Venezuela (Amazonas, Bolívar) and S Guyana to E Ecuador, E Peru, N Bolivia and NW & NC Brazil; also N French Guiana and extreme NC Brazil (NE Amapá).



Descriptive notes. 13-13·5 cm; 13·4 g. Generally rather nondescript. Plumage is sandy brown above, crown and lores darker, rump paler, faint whitish supercilium; wings and tail dusky brown; underparts generally paler sandy brown than upperparts; iris dark; bill and legs blackish. Sexes alike. Voice. Usually quiet; call a weak, whistled "fwoit" or "fweet"; pair-members duet with rapid and excited sputtered warbling "weechidle-chee", repeated 4-6 times, often accompanied by wing-fluttering.
Habitat. Along tropical rivers and margins, especially near steep banks, exposed roots, or piles of debris; invariably found near water, especially large rivers. Sea-level to 600 m.
Food and Feeding. Insects. Usually singly or in pairs; often confiding, sometimes repeatedly allowing close approach and then flying only to short distance. Sallies to air or drops to shore for prey, typically from low perch above water; moves vertically with changing water levels, usually maintaining typical perch height of up to 1 m above surface level.
Breeding. Apr-Oct (Peru). Nest an open cup of grass stems, rootlets and mud, placed 3 m above river edge or in steep riverbank, often on hard mud ledge under log or overhang. Clutch 3-4 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to common, but sometimes thinly spread along rivers. Occurs in Alto Orinoco-Casiquiare Biosphere Reserve, in Venezuela, Tinigua National Park, in Colombia, Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, Beni and Pilón Lajas Biosphere Reserves and Madidi National Park, all in Bolivia, and Rio Cristalino Forest Reserve and Tapajós National Park, both in Brazil.
Bibliography. Allen (1995), Alves & Soneghet (1999), Blake (1950, 1962), Chapman (1917c), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Fitzpatrick (1980c, 1981), Friedmann (1948), Hennessey, Herzog, Kessler & Robinson (2003), Hilty (2003), Hilty & Brown (1986), Lanyon (1986a), Meyer de Schauensee (1982), Novaes (1978a), Oren & Parker (1997), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Sick (1993, 1997), Schulenberg *et al.* (2001), Smith & Vuilleumier (1971), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977).

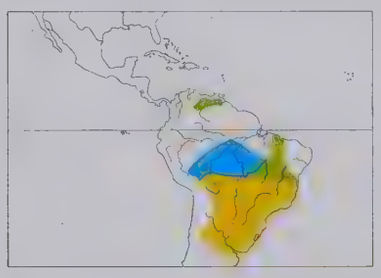
Genus *SATRAPA* Strickland, 1844

289. Yellow-browed Tyrant

Satrapa icterophrys

French: Moucherolle à sourcils jaunes **Spanish**: Mosquero Cejiamarillo
German: Goldbrauentyrann

Taxonomy. *Muscicapa icterophrys* Vieillot, 1818, Paraguay.
Affinities uncertain; has sometimes been grouped with *Tumbezia* and *Myiozetetes* on basis of plumage similarities, but nest type, egg coloration and syringeal morphology provide no obvious taxonomic clues. Monotypic.
Distribution. Breeds locally in C Venezuela, also N & E Bolivia and C & E Brazil S to N & E Argentina, Paraguay and Uruguay; S populations also move N to S part of Amazon Basin in non-breeding season.



Descriptive notes. 15-16·5 cm; 20 g. Has conspicuous and contrasting bright yellow supercilium and dark greyish-olive mask, crown and nape; upperparts dark olive; wings dusky black, two greyish-white wingbars, remiges (especially tertials) edged greyish-white; tail dusky, white outer web of outer rectrices, notched; bright yellow below, olive wash on side of breast; iris dark; bill rather short and narrow, black; legs short, blackish. Female is paler overall than male, notably on supercilium and throat; throat and breast mottled with olive. Juvenile has narrow upper wingbar, olive spots on breast. Voice. Normally silent; very mild but sharp "whee" heard, also very low double "cheep" during brood-feeding; song reported as rising laughter-like "whuee...whee whee whee whee whee".
Habitat. Semi-open edges of forests, lakes, fields and marshy areas. Mostly below 500 m N of R Orinoco; mostly below 2000 m elsewhere, locally to 2600 m (Bolivia).
Food and Feeding. Insects. Usually singly, less often in pairs. Perches with upright posture on bushes, hedgerows or trees; makes short sallies or, more often, gleans from foliage, trunks or branches.
Breeding. Jun-Sept in Venezuela (fledging period in Sept), Oct-Jan in Brazil and Bolivia and Aug-Feb in Argentina. Nest a shallow open cup of rootlets and twigs placed in bush or in fork of tree (e.g. *Ceiba*), one in Argentina with external diameter 12 cm, height 9 cm, internal diameter 7 cm, depth 5 cm, 1·5 m from the ground. Clutch normally 3 eggs, sometimes 2 or 4; incubation period 15-16 days; fledging period 15 -20 days. Nests parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Austral migrant. Post-breeding retreat from S breeding areas, generally wintering N closer to equator; e.g. uncommon during austral winter in Peru along river and forest edges in Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved zone. Sometimes roosts in large flocks with *Tyrannus tyrannus* and *Griseotyrannus aurantioatrocristatus* during migration.
Status and Conservation. Not globally threatened. Uncommon to fairly common; locally common. Typically breeds in habitats of human-populated areas, but occurs also in many national parks and other protected areas, especially in S of range; these include, among others, two national parks in Bolivia, two in Paraguay, Cerro Corá National Park, in Uruguay, and Costanera Sur Ecological Reserve and San Juan de Poriahú Private Reserve (in Iberá Provincial Reserve), both in Argentina.
Bibliography. Babarskas *et al.* (2003), Barrows (1883), Bates & Parker (1998), Belton (1985), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Cruz & Andrews (1989), Di Giacomo (2004), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Friedmann (1927), Hayes (1995), Hilty (2003), Joseph (1996), Klimaitis & Moschione (1987), Lanyon (1986a), López (1997), Lowen *et al.* (1996), Mason (1985), Meyer de Schauensee (1966, 1982), Miserendino (1998), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Navas & Bó (1993a), Nores *et al.* (1983), de la Peña (1987, 1988, 1995), Ridgely & Tudor (1994), do Rosário (1996), Sclater (1888), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1977), Traylor & Fitzpatrick (1982), Wetmore (1926).

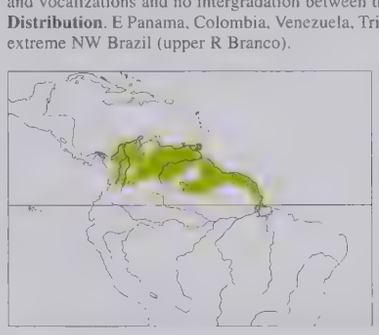
Genus *FLUVICOLA* Swainson, 1827

290. Pied Water-tyrant

Fluvicola pica

French: Moucherolle pie **German**: Elsterwassertyrann **Spanish**: Viudita Pía

Taxonomy. *Muscicapa pica* Boddaert, 1783, French Guiana.
May form a superspecies with *F. albiventer*; often considered conspecific, but differs in plumage and vocalizations and no intergradation between the two. Monotypic.
Distribution. E Panama, Colombia, Venezuela, Trinidad and the Guianas S to upper E Orinoco and extreme NW Brazil (upper R Branco).



Descriptive notes. 12·5-13·5 cm; 11-16 g. Prominent rictal bristles. Male has white head, contrasting black hindcrown and nape; upperparts mixed black and white, some white mottling on back, scapulars broadly white, entire rump white; wings black, tertials narrowly tipped white; tail black, narrowly tipped white; all white below; iris dark; bill sharply hooked at tip, black; legs black. Female is similar, but hindcrown and back mixed brownish. Juvenile has pattern of adult but much duller, with brown replacing black. Voice. Call a nasal, buzzy "zhweeoo" or "dreeap" (sometimes accompanied by vertical jump of c. 1 m), heard most often at dawn or dusk; also soft "pik", like sound of bubble bursting; song a repeated, buzzy "choo-wer".
Habitat. Around freshwater marshes, ponds and lakes, sometimes out into adjacent open areas, corrals and gardens. Mostly below 450 m, locally to 1000 m.
Food and Feeding. Insects. Usually singly or in scattered pairs. Conspicuous and tame. Usually forages in the open, gleaning prey from foliage and emergent vegetation over water; also flies to the ground or water to snatch items; occasionally runs short distances, or sallies from ground for flying prey. Frequently seen on floating vegetation.
Breeding. Apr-Nov in Venezuela and Colombia; Jun-Oct, once in Jan, in Trinidad. Nest, built by both sexes, a large oval or spherical ball, side entrance near top, made of dried grass, plant down and leaves, with feather lining, placed conspicously at end of branch, on stump or in small bush, often low over water. Clutch 2-3 eggs; incubation and brood-feeding by both parents; no information on incubation and nestling periods. Sometimes parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to locally common. May be slowly increasing its range in Panama and perhaps elsewhere. Occurs in Tinigua National Park, in Colombia.
Bibliography. Anon. (1998a), Bangs & Penard (1918), Butler (1979), Chapman (1894), Cory & Hellmayr (1927), Cruz & Andrews (1997), ffrench (1991), Friedmann (1948), Friedmann & Smith (1950), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Herklots (1961), Hilty (2003), Hilty & Brown (1986), Lefebvre *et al.* (1992), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Sick (1993, 1997), Skutch (1985), Smith, W.J. (2001), Snyder (1966), Stotz *et al.* (1996), Todd & Carriker (1922), Tostain (1980), Tostain *et al.* (1992), Varty *et al.* (1986), Wetmore (1939, 1972).

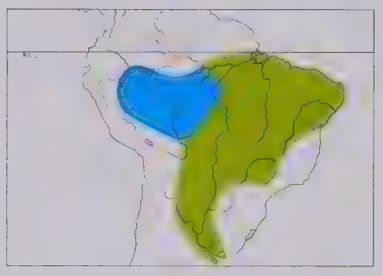
On following pages: 291.Black-backed Water-tyrant (*Fluvicola albiventer*); 292. Masked Water-tyrant (*Fluvicola nengeta*); 293. White-headed Marsh-tyrant (*Arundinicola leucocephala*); 294. Cock-tailed Tyrant (*Alectrurus tricolor*); 295. Strange-tailed Tyrant (*Alectrurus risora*); 296. Streak-throated Bush-tyrant (*Myiotheretes striaticollis*); 297. Santa Marta Bush-tyrant (*Myiotheretes pernix*); 298. Smoky Bush-tyrant (*Myiotheretes fumigatus*); 299. Rufous-bellied Bush-tyrant (*Myiotheretes fuscorufus*); 300. Red-rumped Bush-tyrant (*Cnemarchus erythropygius*); 301. Chocolate-vented Tyrant (*Neoxolmis rufiventris*); 302. Rufous-webbed Bush-tyrant (*Polioxolmis rufipennis*).

291. Black-backed Water-tyrant

Fluvicola albiventer

French: Moucherolle à dos noir **Spanish**: Viudita Dorsinegra
German: Schwarzrücken-Wassertyrann

Taxonomy. *Muscicapa albiventer* Spix, 1825, Bahia, Brazil.
May form a superspecies with *F. pica*; often considered conspecific, but differs in plumage and vocalizations and no intergradation between the two. Monotypic.
Distribution. Breeds from NC & E Brazil (lower Amazon region and Maranhão E to Rio Grande do Norte, S locally to Mato Grosso do Sul and W São Paulo) S to E Bolivia, Paraguay, N Argentina (S to La Rioja, Santa Fe and Buenos Aires) and W Uruguay; also occurs in W Amazonian Brazil, SE Peru and N Bolivia in non-breeding season.



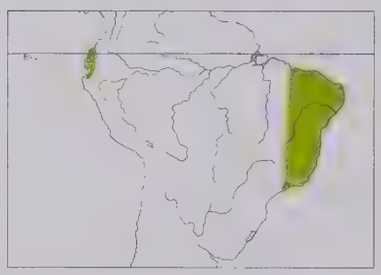
Descriptive notes. 14 cm. Male has very distinctive plumage, with black upperparts and white underparts: white head, and contrasting black hindcrown and nape; mostly black above, with variable narrow white wingbars, and narrow white band across rump; variable white feather tips and edges to tail; pure white below; iris dark; bill and legs black. Female similar to male. Voice. Call "tika".
Habitat. Marshes and nearby shrubby vegetation, and beside rivers and oxbow lakes; mostly below 1000 m.
Food and Feeding. Insects. Usually quite bold, sometimes even inquisitive. Forages on or near ground, often moving out on to floating and emergent vegetation, frequently cocking and fanning its tail; flight fast and low.
Breeding. Oct-Feb in Argentina. Performs prenuptial flights. Nest a sphere with side opening near top, entrance concealed by "porch", rather loosely constructed from small twigs 0·5-1 cm in thickness and small stems with leaves, lined with feathers and plant down, one in Argentina 11 cm tall and 7 cm wide, with entrance 6·5 × 5 cm; placed low down, near or over water. Clutch 2-3 eggs; incubation period 12-14 days, fledging period 10-15 days. Parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Partial migrant. Some post-breeding migration W into W Amazonian Brazil, SE Peru and N Bolivia, with a few records from NE Peru (N to Loreto); vagrant in Ecuador.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Occurs in a number of national parks and other protected areas; has been recorded in Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone in non-breeding season.
Bibliography. Babarskas *et al.* (2003), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Di Giacomo (2004), Dubs (1992), Fitzpatrick (1980c, 1985a), Friedmann (1927), Hayes (1995), Joseph (1996), Klimaitis & Moschione (1987), Maillard & Lindo (1998), Miserendino (1998), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), Oren & Parker (1997), de la Peña (1987, 1995, 1997), Ridgely & Tudor (1994), Robinson (1997), Schubart *et al.* (1965), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Terborgh *et al.* (1984), Wetmore (1926), Zimmer (1937a).

292. Masked Water-tyrant

Fluvicola nengeta

French: Moucherolle aquatique **Spanish**: Viudita Enmascarada
German: Graurücken-Wassertyrann
Other common names: Ecuadorian Water-tyrant (*atripennis*)

Taxonomy. [*Lanius*] *Nengeta* Linnaeus, 1766, Brazil.
Races geographically very remote from each other, sometimes suggested as representing two distinct species. Two subspecies recognized.
Subspecies and Distribution.
F. n. atripennis P. L. Sclater, 1860 - W Ecuador (S from Esmeraldas) S to extreme NW Peru.
F. n. nengeta (Linnaeus, 1766) - E Brazil from Maranhão E to Rio Grande do Norte, S to Minas Gerais, São Paulo and Rio de Janeiro.



Descriptive notes. 14·5-15 cm. Plumage is mostly white, with contrasting black eyestripe, black wings and white-tipped black tail; back tinged brownish-grey; iris dark, bill and legs black. Sexes similar. Race *atripennis* has blacker wings with tertials fringed white. Voice. Call a sharp "kirt!", often given in flight; song a repeated, soft "dewdelewdel-dewdel"; pair-members occasionally chatter together.
Habitat. Lowland semi-open shrubby areas near fresh water, especially in marshy areas and rice fields in lowlands; along shores of ponds, rivers and streams; occasionally in adjacent open areas. Mostly below 300 m; locally to 800 m, rarely to 1300 m.
Food and Feeding. Insects. Usually singly or in pairs, generally tame and conspicuous. Forages mainly on or near ground; runs on floating vegetation; makes short aerial sallies, quick dashes, and upward strikes to snap at insect prey along water's edge.
Breeding. Virtually unknown. Displaying birds face each other with tail spread and raised, bobbing up and down; male sometimes fans tail and spreads wings to display black underside. Nest is a messy ball of grasses and stems, with a side entrance.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common. Appears to be spreading S in Brazil as a result of deforestation; since 1950s recorded at a number of new localities (e.g. Rio Botanical Garden and, later, Zoological Garden, Catete Palace gardens, and Sernambetiba, Marambaia and other places). Tolerant of converted habitat and has relatively large range, within which it occurs in many national parks and other protected areas.
Bibliography. Alves & Pereira (1998), Butler (1979), Cracraft (1985), Develey (2004), Fitzpatrick (1980c, 1981, 1985a), Forrester (1993), Lo (1994), García *et al.* (1998), Ihering (1900), Marques & Alves (2000), Meyer de Schauensee (1982), Pacheco & Simon (1995), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rodrigues & Santos (2000), Schubart *et al.* (1965), Sick (1993, 1997), Silveira *et al.* (2003), Stotz *et al.* (1996), Willis (1991b).

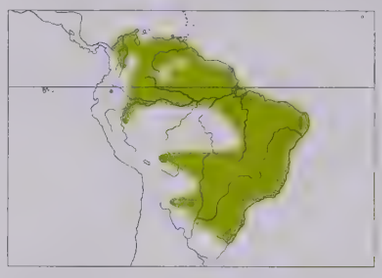
Genus *ARUNDINICOLA* d'Orbigny, 1840

293. White-headed Marsh-tyrant

Arundinicola leucocephala

French: Moucherolle à tête blanche **Spanish**: Viudita Cabeciblanca
German: Weißkopf-Wassertyrann

Taxonomy. *Pipra leucocephala* Linnaeus, 1764, Surinam.
Genus related to *Fluvicola* and sometimes merged with it; anatomical evidence and behaviour, however, suggest that separate generic treatment is more appropriate. Monotypic.
Distribution. N & E Colombia and N & C Venezuela E to Trinidad and the Guianas, S irregularly to E Ecuador, NE Peru, N & E Bolivia, N Argentina, Paraguay and SE Brazil.



Descriptive notes. 12·5-13 cm; 10-16·3 g. Male has white head (slightly bushy-crested) and throat contrasting sharply with blackish-brown or dark chocolate-brown rest of plumage; iris dark brown, eyes prominent; upper mandible blackish, lower mandible paler with yellow at base; legs black. Female has white forecrown, greyish-brown upperparts, darker wings and tail, whitish below, whitest on throat, mottled ashy brown across breast, sides and flanks; bare parts as male. Voice. Usually quiet, occasionally a high, sharp "sedik!"; low "dew-de-lewde" repeated at short intervals in courtship flight.
Habitat. Freshwater marshes, ponds and damp grass in *llanos*, also marshy areas along larger rivers and river islands; mostly below 500 m.
Food and Feeding. Insects. Generally conspicuous, especially male; perches erect. Sallies short distances from posts or low branches over water to air, or briefly to ground, for prey, immediately returning to elevated perch. Rarely descends to ground in manner of *Fluvicola*, and rarely fans or cocks tail.
Breeding. Jun-Nov in Venezuela and Jan-Apr and Jul-Oct in Trinidad; Jan-Mar in Colombia; Oct-Feb in Brazil and Oct-Jan in Argentina. Performs prenuptial flight. Nest, built by both sexes, a ball of grass with side opening near top, entrance concealed by "porch", placed low in bush or rushes near or over water. Clutch 2-4 eggs; incubation and chick-feeding by both sexes, no information on periods. Parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Resident; occasional wanderers reported from NE Peru and NE Ecuador (along R Napo), possibly associated with rapid turnover and succession in appropriate habitat of river islands.
Status and Conservation. Not globally threatened. Fairly common to locally common. Much of its habitat remains in relatively pristine condition within its large range, throughout which it occurs in many national parks and other protected areas.
Bibliography. Bangs & Penard (1918), Belcher & Smooker (1937), Canevari *et al.* (1991), Chapman (1894), Clements & Shany (2001), Cory & Hellmayr (1927), Descourtilz (1983), Di Giacomo (2004), Dubs (1992), ffrench (1991), Fitzpatrick (1980c, 1985a), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Herklots (1961), Hilty (2003), Hilty & Brown (1986), Ihering (1900, 1901), Lanyon (1986a), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1987, 1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), do Rosário (1996), Schubart *et al.* (1965), Short (1975), Sick (1993, 1997), Skutch (1985), Snethlage (1935), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Walker (2002), Wetmore (1926), Young (1929).

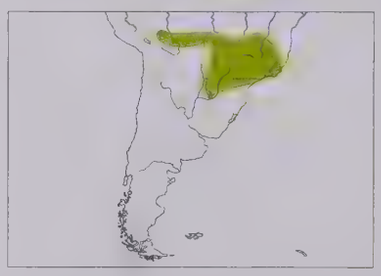
Genus *ALECTRURUS* Vieillot, 1816

294. Cock-tailed Tyrant

Alectrurus tricolor

French: Moucherolle petit-coq **German**: Hahnenschwanztyrann **Spanish**: Yetapá Chico

Taxonomy. *Gallita tricolor* Vieillot, 1816, Paraguay.
Genus appears to be most closely allied to *Fluvicola* and *Arundinicola*. Monotypic.
Distribution. N & E Bolivia (Santa Cruz), S Brazil (S Mato Grosso E to Minas Gerais and Rio de Janeiro, S to São Paulo), NE Paraguay and NE Argentina (Misiones, Corrientes).



Descriptive notes. 12 cm, breeding-plumaged male to 19 cm. Male has white or whitish face; mostly black above, with grey on rump (black feathers brown-fringed in fresh plumage), white shoulders and patch on secondaries; tail extraordinary, wide, stiff central rectrices twisted 90 degrees so that vanes in vertical position, remaining rectrices laterally compressed against central ones, mostly frayed near tip; mostly white below, black patch on each side of chest forming partial collar; iris dark brown; bill mostly yellowish, some dusky coloration on culmen, lower mandible generally paler; legs grey. Female is mottled brown above, wings darker brown, tail dark brown, short, and normal in shape; throat white, underparts whitish, often tinged buff, some brown on chest sides forming partial collar. Immature male resembles female. Voice. Mostly silent; weak "tic-tic-tic" by male during aerial courtship.
Habitat. Large expanses of open, grassy habitats, especially *campo*, *cerrado* and humid savanna; in tall grass that has not been recently burned or heavily grazed; occasionally occupies shrubby margins adjacent to open grass or near water. Mostly below 1100 m.
Food and Feeding. Arthropods. Often gregarious, even during breeding; large aggregations of female-plumaged birds sometimes seen. Conspicuous; while perched, often jerks tail upwards and

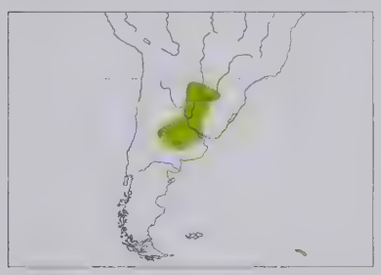
then lowers it slowly at 1-second intervals, accompanied by wing-flick. Forages with aerial hawking, sally-gleaning or hover-gleaning against shrubs or grass stalks; peculiar, insect-like wingbeats, often making audible buzzy sound.
Breeding. Aug-Nov; timing of breeding may vary with onset of rains. Male displays by rising slowly into air from 5 m up to 100 m with exaggerated fast, fluttery wingbeats, and alternating tail position between straight down and cocked well above horizontal. Nest a neat grassy cup, hidden on or near ground. No other information.
Movements. Resident; possibly partially migratory or nomadic.
Status and Conservation. VULNERABLE. Uncommon to locally common; very local, largely because of rarity of undisturbed habitat, especially tall grass; numerous only in protected areas. Estimated global population of at least 10,000 individuals; continuing to decline, and no recent reports from a large portion of its former range of c. 626,000 km², which is increasingly fragmented owing to native grassland being burned, drained and coverted for pasture, eucalypt (*Eucalyptus*) and pine (*Pinus*) plantations and agriculture (encouraged by government incentives). Normally disappears from burnt areas, but has been observed feeding on the ground in recently burnt areas. By 1993, two-thirds of *cerrado* region in C Brazil had been heavily or moderately altered, leading to a catastrophic loss of range in Brazil and Argentina (where the species has not been recorded since 1979, despite intensive searches). Few undisturbed areas remain outside protected areas, and these may soon be degraded by spreading fires and overgrazing or disappear completely through agricultural conversion. The species remains common only in undisturbed grasslands, e.g. Gama-Cabeça de Veado Environmental Protection Area, São Miguel Wildlife Sanctuary and Brasília, Emas and Serra da Canastra National Parks, all in Brazil. It occurs also in a few scattered protected areas in Goiás, Distrito Federal, Minas Gerais and Paraná, in Brazil, Beni Biosphere Reserve, in Bolivia, and San Rafael and San Luis National Parks, Tapytá Private Nature Reserve, and Sombrero Private Reserve, in Paraguay.
Bibliography. Anon. (2003h), Brace *et al.* (1997), Bucher & Nores (1988), Canevari *et al.* (1991), Capper *et al.* (2000), Cavalcanti (1988), Chebez (1994), Collar *et al.* (1994), Cory & Hellmayr (1927), Descourtilz (1983), Dubs (1992), Hayes (1995), Lanyon (1986a), Lowen *et al.* (1996), Machado *et al.* (1998), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Navas & Bó (1988), Parker *et al.* (1991), Pearman & Abadie (1995), de la Peña (1988), Ridgely & Tudor (1994), Robbins *et al.* (1999), Short (1975), Sick (1993, 1997), Silveira (1998), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tobias *et al.* (1993), Traylor (1977), Willis & Oniki (1988c).

295. **Strange-tailed Tyrant**

Alectrurus risora

French: Moucherolle à queue large **Spanish**: Yetapá Acollarado
German: Rotkehl-Schleppentyrann

Taxonomy. *Muscicapa risora* Vieillot, 1824, Rio Grande do Sul, Brazil.
Genus appears to be most closely allied to *Fluvicola* and *Arundinicola*. Present species formerly placed in a monotypic genus, *Yetapa*, on basis primarily of exaggerated tail and elongated hallux; it does, however, have very similar plumage pattern to that of *A. tricolor*, with which it shares highly modified outer rectrices and numerous other derived features unique within the family. Monotypic.
Distribution. S Brazil (locally S Mato Grosso, São Paulo, Rio Grande do Sul), N Argentina (E Formosa and Misiones S to Córdoba and N Buenos Aires), E Paraguay and Uruguay.



Descriptive notes. 20 cm, breeding male 30 cm including tail. Male is mostly black above (feathers fringed brown in fresh plumage), with grey on rump, whitish scapulars, whitish tips of wing-coverts and edging on flight-feathers; tail greatly elongated, outer rectrices highly modified, twisted and lengthened, reduced to the shaft at base but with outer two-thirds of inner web becoming very broad, these feathers held perpendicular to and below rest of tail; throat bare, skin pinkish-red or pinkish-orange; broad breastband black, lower underparts white; iris brown; bill mostly pinkish-yellow, lower mandible generally more orange; legs dark grey, unusually long hind-claw. Non-breeding male may have narrower, shorter tail plumes, also has white-feathered (not bare) throat. Female is mottled brown above, outer two pairs of rectrices elongated and reduced, terminating in narrow racquets; throat white, underparts whitish, often tinged buff, with complete brown pectoral band. VOICE. Male call unknown; female call, when young close, is a repetitive, soft and weak whistled "thee-uu, schee-uu", final note descending.
Habitat. Savannas, marshes and damp grasslands; also shrubby areas. Below 500 m.
Food and Feeding. Insects. Perches conspicuously atop a tall grass stem, post or shrub, sallying both into the air and to grass for prey. Male flies slowly and weakly, whipping long tail up and down, or with elongated feathers carried straight down beneath rest of tail. Forms small loose flocks, including reported groups of up to 30 females, during non-breeding season.
Breeding. Eggs in Sept-Dec. Nest an open grassy cup, lined with feathers, hidden on or near ground. Clutch 3 eggs. No other information.
Movements. Resident; possibly a partial migrant in S part of range.
Status and Conservation. VULNERABLE. Rare to locally uncommon or fairly common. Estimated global population at least 10,000 individuals continuing to decline, and no recent reports from a large portion of its former range of c. 100,000 km², which is increasingly fragmented owing to native moist grassland being burned, drained and cultivated for pasture, eucalypt (*Eucalyptus*) and pine (*Pinus*) plantations and agriculture (encouraged by government incentives). This species' preference for tall grasses suggests that it is intolerant of even biannual burning; pesticides, fertilizers and other chemicals are widely used and must have profound effects. Consequently, there has been a catastrophic loss of range in Brazil (last record in Rio de Janeiro in 1974, and even older records from Mato Grosso, São Paulo and Rio Grande do Sul), Uruguay (formerly uncommon breeder, but only one unconfirmed record since 1986) and Argentina (no recent records from several provinces or from Urugua-í Provincial Park, in Misiones, where all suitable habitat now destroyed). In Paraguay, it remains locally numerous, e.g. W of San Juan Bautista (Misiones), in Estancia San José and La Golondrina Private Nature Reserve (both in Presidente Hayes), and in three areas within San Rafael National Park; also recorded in the proposed Tacuara National Park. In Argentina, regularly recorded at El Bagual, Guaycolec and San Juan de Poriahú Private Reserves, and El Palmar and Mburucuyá National Parks, and in the 12,000-km² Iberá Natural Reserve, in Corrientes, where the largest known population was estimated at c. 23,000 birds in 1992; recent records indicate that numbers in Chaco and Formosa are considerably lower. A conservation award was recently given to study different management regimes and to raise public awareness at Mburucuyá National Park. Although the species is apparently resident throughout much of its range, seasonal movements have been noted in Buenos Aires and several of the Paraguayan records are thought to refer to migrants, making part of the population vulnerable to loss of either breeding or wintering habitats.
Bibliography. Bucher & Nores (1988), Canevari *et al.* (1991), Chebez (1994), Chebez *et al.* (1999), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Descourtilz (1983), Di Giacomo (2004), Di Giacomo & Di Giacomo (2004), Dubs (1992), Ericson & Amarilla (1997), Hayes (1995), Lanyon (1986a), Lowen *et al.* (1996), Meyer de Schauensee (1966, 1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Navas & Bó (1988), Pacheco & Gonzaga (1994), Pearman & Abadie (1995), de la Peña (1988), Ridgely & Tudor (1994), Short (1975), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Traylor (1977), Wege & Long (1995), Wetmore (1926).

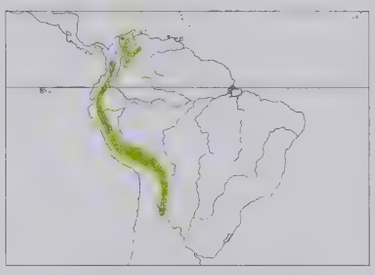
Genus *MYIOTHERETES* Reichenbach, 1850

296. **Streak-throated Bush-tyrant**

Myiotheretes striaticollis

French: Moucherolle à gorge rayée **German**: Streifenkehl-Buschtyrann **Spanish**: Birro Grande

Taxonomy. *Taenioptera striaticollis* P. L. Sclater, 1853, Ecuador.
Genus sometimes placed near *Gubernetes* and *Muscipipra* on basis of anatomical and morphological characters; also, *Polioxolmis* and *Cnemarchus* have frequently been merged with this genus. Two subspecies recognized.
Subspecies and Distribution.
M. s. striaticollis (P. L. Sclater, 1853) - Sierra de Perijá and W Andes of Venezuela and Colombia S to N & C Peru (S to Apurímac and Arequipa).
M. s. pallidus Berlepsch, 1906 - E Andes in Peru (Cuzco, Puno), Bolivia and NW Argentina (S to Tucumán).



Descriptive notes. 21-23 cm; 64 g. Largest *Myiotheretes*. Plumage is brown above, crown and face darker, faint whitish supraloral stripe; wings dusky, cinnamon-rufous edging, wide cinnamon-rufous band along base of remiges (prominent in flight); tail dusky above, cinnamon below with outer third blackish; throat white with bold, heavy black streaks continuing to chest; upper chest pale brown, remaining underparts cinnamon-rufous; cinnamon underwing-coverts; iris dark brown; bill large, slightly hooked, blackish; legs blackish. Sexes alike. Race *pallidus* is somewhat smaller and paler than nominate, with slightly narrower streaks on throat. VOICE. Call a loud, rising whistle, "pseeeeee", with almost human quality; territorial call 2-4 loud, human-like whistles, "püéét wüéét sueet peeu"; infrequently heard song "tsi-seeee-rit" or "tsi-si-see-rit", reminiscent of that of *Tyrannus melancholicus*.
Habitat. Semi-open shrubby or grassy regions; in forest and woodland borders near cliffs, landslides or roadcuts; often partially cultivated terrain with shrubby areas and woodland patches; generally avoids extensively forested regions. At 1500-3700 m, mostly 2400-3400 m; occasionally down to 500 m in Peru (Arequipa) and Bolivia.
Food and Feeding. Insects and small vertebrates. Forages singly or pair-members widely spaced. Uses exposed and elevated (often highly so) perches; conspicuous. Sallies or, less frequently, drops to the ground for prey, sometimes travelling great distances; often returns to same perch.
Breeding. Jan-Jun in N Colombia (Perijá, Santa Marta Mts); nestlings in early Mar in Venezuela (Mérida). Nest reported as a messy cup placed under bridge or overhanging structure. No other information.
Movements. Resident; some seasonal altitudinal movement reported.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Never really common; given its tolerance of converted habitat, however, it is not threatened. Occurs in Sierra Nevada National Park, in Venezuela, Guandera Biological Reserve, in Ecuador, Machu Picchu Historical Sanctuary, in Peru, and Tarija National Park, in Bolivia.
Bibliography. Best *et al.* (1993), Canevari *et al.* (1991), Clements & Shany (2001), Cory & Hellmayr (1927), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Hilty (2003), Hilty & Brown (1986), Lanyon (1986a), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Nores *et al.* (2000), de la Peña (1988, 2001a), Ridgely & Tudor (1994), Salaman (1994), Schulenberg & Servat (2001), Stotz *et al.* (1996), Varty *et al.* (1986), Vuilleumier (1994), Walker (2001), Zimmer (1930, 1937a).

297. **Santa Marta Bush-tyrant**

Myiotheretes pernix

French: Moucherolle des Santa Marta **Spanish**: Birro de Santa Marta
German: Santa-Marta-Buschtyrann

Taxonomy. *Ochthodiaeta pernix* Bangs, 1899, Macotama, Santa Marta Mountains, Colombia.
Genus sometimes placed near *Gubernetes* and *Muscipipra* on basis of anatomical and morphological characters; also, *Polioxolmis* and *Cnemarchus* have frequently been merged with this genus. This species formerly placed with *M. fumigatus* and *M. fuscorufus* in a separate genus, *Ochthodiaeta*. Monotypic.
Distribution. Santa Marta Mts, in N Colombia.
Descriptive notes. 18-21 cm. Has whitish supraloral stripe; dark brown above; wings darker, two pale cinnamon or rufous wingbars, rufous edges of inner flight-feathers; tail blackish, outer web of outer rectrix ferruginous or rufous-brown; throat white, narrowly and obscurely streaked dusky; underparts deep rufous, tinged olive on chest. Differs from *M. striaticollis* in smaller size, darker underparts, less cinnamon-rufous on tail. Sexes alike. VOICE. Call a short but loud, descending whistle, "weeuuu, heeuuu, heeuu", often repeated for up to a minute or longer.
Habitat. Shrubby borders of montane forest and secondary woodland, rarely in adjacent shrubby clearings, roadcuts, and overgrown hillsides; usually associated with forest edges. At 2100-2900 m.



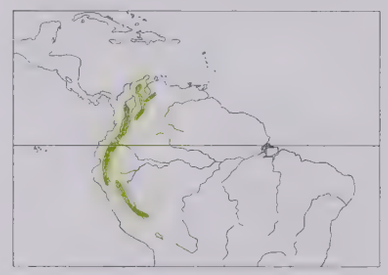
Food and Feeding. Insects. Usually alone or in pairs; occasionally with mixed-species flocks. Makes long sallies from top of bush or small tree; occasionally sallies within tree crown.
Breeding. Unknown.
Movements. Resident.
Status and Conservation. ENDANGERED. Restricted-range species: present in Santa Marta Mountains EBA. Uncommon. Global population of a few thousand individuals confined to area of 570 km² on N slope of Sierra Nevada de Santa Marta, where localized and fragmented. Recent records only from the San Lorenzo ridge, and it can be seen along lower elevations of the San Lorenzo road. Likely that other localities exist, but recent surveys in suitable habitat have not produced new records. Habitat declining owing to continuing forest conversion for marijuana plantations; only 15% of original vegetation in the Sierra Nevada de Santa Marta remains, although largely on N slope where this species occurs. Less significant threats are logging, burning, planting with exotic trees, e.g. pines (*Pinus*), and agricultural expansion, e.g. livestock grazing and coffee at lower altitudes. Remaining pristine habitats are protected within Sierra Nevada de Santa Marta and Tayrona National Parks and the Sierra Nevada de Santa Marta Biosphere Reserve, but these formal designations have so far not been effective. More work with local communities and regional institutions is needed in order to identify conservation and management strategies and establish priorities.
Bibliography. Anon. (1992), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Hilty & Brown (1986), Lanyon (1986a), Meyer de Schauensee (1982), Moynihan (1979), Negret (2001), Orejuela (1985), Ridgely & Tudor (1994), Salaman *et al.* (2002), Stattersfield & Capper (2000), Stotz *et al.* (1996), Vuilleumier (1994).

298. **Smoky Bush-tyrant**

Myiotheretes fumigatus

French: Moucherolle enfumé **German**: Rußbuschtyrann **Spanish**: Birro Ahumado

Taxonomy. *Tyrannula fumigata* Boissonneau, 1840, "Bogota," Colombia.
Genus sometimes placed near *Gubernetes* and *Muscipipra* on basis of anatomical and morphological characters; also, *Polioxolmis* and *Cnemarchus* have frequently been merged with this genus. This species formerly placed with *M. pernix* and *M. fuscorufus* in a separate genus, *Ochthodiaeta*. Four subspecies recognized.
Subspecies and Distribution.
M. f. olivaceus (Phelps. Sr & Phelps, Jr, 1953) - N Colombia (Sierra de Perijá) and W Venezuela (Cerro Tetari, in W Zulia, and R Chiquito, in S Táchira).
M. f. lugubris (Berlepsch, 1883) - Andes of W Venezuela (Trujillo S to N Táchira).
M. f. fumigatus (Boissonneau, 1840) - Colombia (except Santa Marta region) and N Ecuador.
M. f. cajamarcae (Chapman, 1927) - S Ecuador (Cañar) and Peru (S to Cuzco).



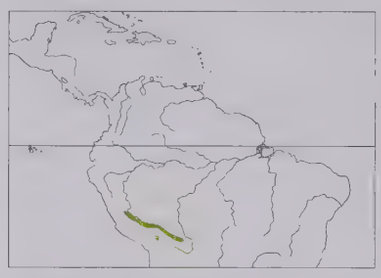
Descriptive notes. 18-20·5 cm. Dark and nondescript flycatcher, almost like a thrush (Turdidae). Nominate race has narrow white supercilium; uniform dark smoky brown above, wings and tail blackish, wing-coverts narrowly edged buffy; base of flight-feathers cinnamon on inner webs (prominent in flight); outer tail feathers edged whitish; dark below, chin and throat faintly mottled whitish, throat tinged ochraceous, undertail-coverts dingy buff; cinnamon underwing-coverts (prominent in flight); bare parts black. Sexes alike. Juvenile is similar to adult, but with cinnamon wingbars and remex edging, ochraceous vent. Race *lugubris* has reduced supercilium, and ochraceous crissum; *olivaceus* has supercilium dull greyish-white, brownish vent; *cajamarcae* is darker overall, with reduced supercilium. Voice. Relatively quiet; pre-dawn song a sustained series of whistled "cheea, cheea, cheea, chuéé", alternating 3 and 4 notes (one of the earliest pre-dawn singers in Venezuela); call a soft, descending whistle, "peeee".
Habitat. Middle growth and subcanopy of humid montane and elfin forests; often at edge of clearings and on shrubby slopes with scattered trees. Mostly occurs at 1800-3000 m, but occasionally up to 3600 m.
Food and Feeding. Insects. Found singly or in pairs, occasionally accompanying mixed flocks. Perches just below the canopy; alert and erect posture. Usually hawks prey from air or foliage, less frequently near or on the ground; sallies to snap insects from foliage or limbs.
Breeding. In Colombia, Jul-Aug in Sierra de Perijá and N & E Andes and Nov in Cundinamarca; fledglings in Feb in S Colombia (Cauca) and Jan in C Peru (Huánuco). No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common; rare in Peru. Occurs in Guaramacal and Sierra Nevada National Parks, in Venezuela, and all national parks in Andes of Ecuador and Peru S to Machu Picchu Historical Sanctuary.
Bibliography. Allen (1998), Baez *et al.* (1997), Butler (1979), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Lanyon (1986a), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996), Vuilleumier (1994), Walker (2001).

299. **Rufous-bellied Bush-tyrant**

Myiotheretes fuscorufus

French: Moucherolle à ventre fauve **Spanish**: Birro Ventrirrufo
German: Rostbinden-Buschtyrann

Taxonomy. *Ochthodiaeta fuscorufus* P. L. Sclater and Salvin, 1876, Tilotilo, Yungas, La Paz, Bolivia.
Genus sometimes placed near *Gubernetes* and *Muscipipra* on basis of anatomical and morphological characters; also, *Polioxolmis* and *Cnemarchus* have frequently been merged with this genus. This species formerly placed with *M. pernix* and *M. fumigatus* in a separate genus, *Ochthodiaeta*. Monotypic.
Distribution. SE Peru (Cuzco, Puno) and W Bolivia (La Paz, Cochabamba).



Descriptive notes. 18-19 cm. Has short whitish supercilium, dark eyeline; mainly brown above; wings blackish, two broad rufous wingbars, prominent rufous edging on inner flight-feathers (in flight, rufous in wings and dark terminal band on secondaries prominent); tail mostly blackish, outer web of outermost rectrix and edging on all inner webs cinnamon; throat whitish; underparts cinnamon, lower throat and chest faintly and obscurely streaked and mottled with brownish-olive; underside of tail dark with rufous down centre; iris dark; bill black; legs blackish. Voice. Dawn song 2-4 whistles followed by "pip pip pip pi-doo" notes. Clicks bill when agitated.
Habitat. Canopy borders of primary cloudforest (e.g. *Alnus*, Melastomataceae), adjacent secondary woodland, bamboo and other understorey vegetation types. Mainly 1900-3550 m.
Food and Feeding. Insects. In pairs or family groups; rarely accompanies mixed-species flocks. Often perches just inside the forest or at edge of clearings. Sallies to foliage and to the air; hawks or gleans insects from all levels, but mainly upper canopy.
Breeding. Unknown.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Northeast Peruvian Cordilleras EBA and Bolivian and Peruvian Upper Yungas EBA. Rare to locally uncommon; common in Cocapata area (in Ayopayo province, NW of Cochabamba), in Bolivia. Occurs also on N side of the Abra Málaga road in Cuzco and in Machu Picchu Historical Sanctuary, both in Peru, and Madidi National Park, in Bolivia. Cloudforests within this species' range are in relatively pristine condition. Upper Yungas in Peru and Bolivia are still largely forested, as extensive tracts are undisturbed or protected in large reserves, such as the Tambopata-Candamo Reserved Zone and Madidi and Cotapata National Parks.
Bibliography. Clements & Shany (2001), Cory & Hellmayr (1927), Collar *et al.* (1994), Fjeldså & Krabbe (1990), García *et al.* (1998), Hennessey & Gómez (2003), Hennessey, Herzog & Sagot (2003), Herzog *et al.* (1999), Hinojosa *et al.* (1998), Lanyon (1986a), Meyer de Schauensee (1982), Remsen (1985), Ridgely & Tudor (1994), Schulenberg *et al.* (1984), Stotz *et al.* (1996), Vuilleumier (1994), Walker (2001).

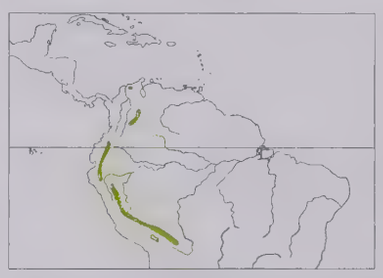
Genus *CNEMARCHUS* Ridgway, 1905

300. **Red-rumped Bush-tyrant**

Cnemarchus erythropygius

French: Moucherolle à croupion roux **Spanish**: Birro Culirrojo
German: Rostbürzel-Buschtyrann
Other common names: Red-rumped Ground-tyrant

Taxonomy. *Taenioptera erythropygia* P. L. Sclater, 1853, Verdecocha, Pichincha, Ecuador.
Was formerly sometimes placed in *Myiotheretes* or *Xolmis*. Most recent authors prefer retention of monotypic genus on basis of internal and external morphology. Races poorly differentiated. Two subspecies recognized.
Subspecies and Distribution.
C. e. orinomus Wetmore, 1946 - N & C Colombia (Santa Marta Mts and NE Andes).
C. e. erythropygius (P. L. Sclater, 1853) - S Colombia (Nariño) S to W & C Bolivia (La Paz, Cochabamba).



Descriptive notes. 20-23 cm. Large and unmistakable flycatcher. Has crown light grey with narrow black shaft streaks, forehead grizzled whitish, vague whitish supercilium; dark brownish-grey or brownish-slate above, contrasting rufous rump; wings dusky, white patch on tertials (especially conspicuous in flight); central tail feathers blackish, others rufous with terminal third black; throat streaked grey and white, becoming solid grey on upper breast, sharply rufous on belly; cinnamon underwing-coverts; iris dark; bill and legs black. Sexes alike. Juvenile has little white on forehead. Race *orinomus* very similar to nominate Voice. Usually quiet; call a short, blurry whistle, "wheeeu"; occasional shrill "kyeee" and higher-pitched "skyeik"; sometimes faint scratching sounds, "kerkkekkek".
Habitat. Montane scrub, *páramo* and *Polylepis* woodland; areas with scattered shrubs and low trees; often found in *puna* and grassland adjacent to scrubby areas. Mostly 2850-4000 m, occasionally to 4300 m.
Food and Feeding. Insects. Often found singly, less often in pairs or family groups. Usually conspicuous; perches on fences, boulders, bushes and wires; takes most prey by dropping to ground, less frequently sallies.
Breeding. Birds in breeding condition in Mar and Sept in Colombia; eggs in Nov in Peru (Puno). Nest an open cup placed low in bush. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Locally uncommon; rare in Colombia. Occurs in Las Cajas National Recreation Area and Guandera Biological Reserve, in Ecuador, Machu Picchu Historical Sanctuary, in Peru, and Madidi National Park, in Bolivia. Generally believed to occur in low densities, and is not frequently recorded.
Bibliography. Butler (1979), Carriker (1935), Clements & Shany (2001), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Hennessey, Herzog & Sagot (2003), Hilty & Brown (1986), Kessler & Herzog (1998), Lanyon (1986a), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996).

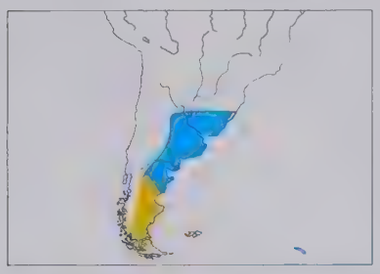
Genus *NEOXOLMIS* Hellmayr, 1927

301. **Chocolate-vented Tyrant**

Neoxolmis rufiventris

French: Moucherolle à ventre bai **Spanish**: Monjita Chocolate
German: Hellschulter-Nonnentyrann

Taxonomy. *T[yrannus] rufiventris* Vieillot, 1823, Santa Lucía River, Uruguay.
Placed in *Myiotheretes* by early authors, and sometimes in *Xolmis* by more recent ones; syringeal morphology most similar to otherwise different *Gubernetes* and *Muscipipra*. Monotypic.
Distribution. Breeds SE Argentina (from S Río Negro) S, including extreme S Chile, to Tierra del Fuego; migrates N to C Argentina, Uruguay and SE Brazil.



Descriptive notes. 22-23 cm; 77 g. Large and handsome terrestrial flycatcher. Head is ashy grey, blackish fore-face and ocular region; upperparts brownish-grey; wing-coverts mostly white, greater coverts and tertials edged white or pale sandy brown (appearing silvery in field), secondaries rufous basally, broadly tipped white, remaining remiges black (in flight, wings look long and sharply pointed, white and rufous pattern striking); tail notched, black, outer web of outer rectrices white; throat and breast pure grey, lower breast becoming sharply cinnamon, cinnamon continuing to vent; iris dark; bill and legs black. Sexes alike. Juvenile has ear-coverts tinged rufous, breast, sides and upper belly broadly streaked dark grey. VOICE. Usually quiet; breeding male emits weak "bur-bit" at dawn and dusk from the ground or a rock.
Habitat. Semi-open and open grass and scrub-covered steppe with scattered tussocks and *Berberis* or *Verbena* bushes; hummocks of *Azorella* and crowberry (*Empetrum*), and agricultural fields or pastures. Mostly below 500 m, locally to 1200 m.
Food and Feeding. Insects, including large beetles (Coleoptera), also small vertebrates (lizards). Usually in widely spaced pairs, but in non-breeding season occurs in small flocks. Primarily terrestrial, but often perches on low bushes; mostly walking or running quickly, then pausing and standing erect on ground or low mound, nervously flicking wings and tail. Flight swift and direct, pair-members or small groups often chasing one another.
Breeding. Nov-Dec in Argentina. Nest a bowl-shaped cup, lined with grasses and feathers, diameter c. 10-10·4 cm, depth 5-6·9 cm; placed on ground, partially concealed by low shrub or tussock. Clutch 2-3 eggs. No other information.
Movements. After breeding, moves N to winter in NE Argentina (mostly Córdoba, Santa Fe and Entre Rios S to Río Negro and Buenos Aires), Uruguay and SE Brazil (Rio Grande do Sul).
Status and Conservation. Not globally threatened. Restricted-range species: present in Southern Patagonia EBA. Rare to uncommon. Fairly common around El Caín (S Río Negro) and Estancia Las Vegas (S Santa Cruz), in Argentina. Numbers may greatly fluctuate in S part of range, where absent in some years and abundant in others; alternatively, may be decreasing overall, as few recent reports of high local abundance. Much grassland has already been destroyed by grazing sheep, and only few protected areas exist, e.g. Tierra del Fuego National Park, in Argentina, and Magallanes National Reserve, in Chile.
Bibliography. Andors & Vuilleumier (1998), Araya & Chester (1993), Canevari *et al.* (1991), Clark (1986), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Cracraft (1985), Fjeldså & Krabbe (1990), Harris (1998), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967), Joseph (1996), Lanyon (1986a), Marín (2004), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1987, 1988, 1997), Ridgely & Tudor (1994), Ridgway (1905), Sick (1993, 1997), Smith & Vuilleumier (1971), Stotz *et al.* (1996), Ridgely & Tudor (1994), Vuilleumier (1994).

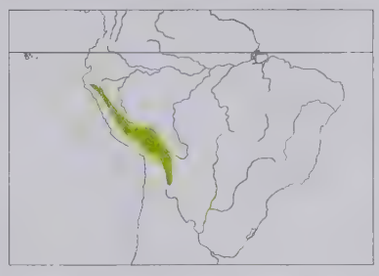
Genus *POLIOXOLMIS* W. E. Lanyon, 1986

302. **Rufous-webbed Bush-tyrant**

Polioxolmis rufipennis

French: Moucherolle à ailes rousses **German**: Rostspiegel-Buschtyrann **Spanish**: Birro Alirrufo
Other common names: Rufous-webbed Tyrant/Ground-tyrant

Taxonomy. *Muscisaxicola rufipennis* Taczanowski, 1874, Maraynioc, Peru.
Formerly placed in *Cnemarchus* or *Xolmis*, and sometimes grouped with *Myiotheretes*; syringeal and other morphological evidence, however, indicates that current monotypic genus for this species is warranted. Two subspecies recognized.
Subspecies and Distribution.
P. r. rufipennis (Taczanowski, 1874) - Andes of Peru (S from S Amazonas, Cajamarca and Lambayeque) and W Bolivia.
P. r. bolivianus Fjeldså, 1990 - Andes of WC Bolivia S to extreme N Chile and NW Argentina.



Descriptive notes. 18-21·5 cm. Nominate race is uniform ashy grey above, pale grey or whitish supercilium and black eyeline; remiges cinnamon at base with dark tips, most extensive on primaries, tail dusky, outer web of outer rectrices white, inner webs of all but central pair cinnamon with dusky tips (wing and tail patterns striking in flight); throat paler and faintly streaked; paler ashy grey below, whitish vent and lower belly; underwing-coverts cinnamon; iris pale; bill long, with hooked tip, blackish; legs blackish. Sexes alike. Juvenile has belly more decidedly tinged buff. Race *bolivianus* is slightly smaller than nominate, browner grey, with narrower tailband. VOICE. Call a high-pitched "tree", given throughout day; alarm similar, but shorter.
Habitat. Semi-arid montane slopes near timber-line, especially grassland with cacti, low woodlands and low shrubs, and in *Polylepis* groves and adjacent scrub, usually where there are boulders or cliff faces. Sometimes in farms and gardens with trees present. Mostly 3000-4500 m, occasionally somewhat lower.
Food and Feeding. Insects. Usually singly or in pairs; conspicuous. Prefers perches on bushes, low trees or cliffs when hunting. Drops from perch to capture prey, less often runs or sallies in pursuit of prey; often hovers.
Breeding. In Peru, nesting in late Dec (Puno) and fledgling in Feb (Ancash). Performs a hovering-gliding display 10-12 m above ground. Nest a simple open cup, placed in tree (usually *Polylepis*) or the bromeliad *Puya raimondii*. Both adults recorded feeding two nestlings. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Appears to be generally rather rare, though locally fairly common. Recent information suggest that the species may be extending its range southwards. Possibly breeds in extreme N Chile: recently reported from Las Vicuñas National Reserve, N Chile, where, despite official protection, *Polylepis* woodland is still being damaged by firewood gathering, and may be threatened by proposed new tourist highway. Also occurs in Huascarán National Park, Machu Picchu Historical Sanctuary and Pampa Galeras National Reserve, all in Peru, and Sajama and Tunari National Parks, in Bolivia.
Bibliography. Canevari *et al.* (1991), Clements & Shany (2001), Cracraft (1985), Fjeldså (1990), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Flores & Capriles (1998), Hennessey, Herzog & Sagot (2003), Knapton (2002), Lanyon (1986a), Mazar Barnett, Clark *et al.* (1998), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Stotz *et al.* (1996), Vuilleumier (1969, 1994), Walker (2001).



PLATE 38

inches 3
cm 8

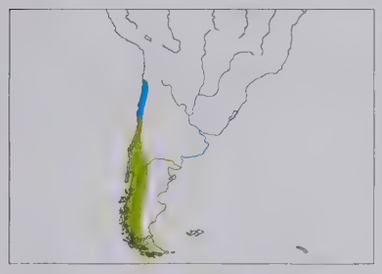
Genus *XOLMIS* Boie, 1826

303. Fire-eyed Diucon

Xolmis pyrope

French: Pépoaza oeil-de-feu **German**: Feueraugen-Nonnentyrann **Spanish**: Diucón

Taxonomy. *Muscicapa Pyrope* Kittlitz, 1830, Tomé, Bahía de Concepción, Chile.
Formerly placed in a monotypic genus, *Pyrope*, on basis of primary structure of male. Two subspecies recognized.
Subspecies and Distribution.
X. p. pyrope (Kittlitz, 1830) - C& S Chile (from Aconcagua) and SW Argentina (from Neuquén) S to Tierra del Fuego; winters in N Chile (S Antofagasta to Coquimbo).
X. p. fortis R. A. Philippi [Bañados] & Johnson, 1946 - Chiloé I, in SC Chile.



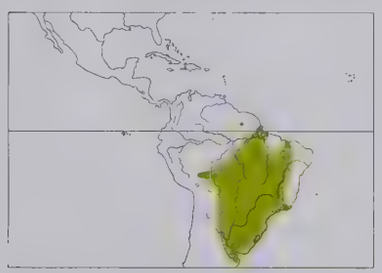
Descriptive notes. 18·5-21·5 cm. Head and back are uniformly dark grey; wings black with narrow grey edging; tail grey, outer feathers slightly paler; pale ashy grey below, throat whiter with faint grey streaking, belly greyish-white, vent white; iris bright red (sometimes inconspicuous); bill black; legs blackish. Sexes alike. Race *fortis* is slightly larger than nominate. Voice. Usually silent; call a low "tick tick;" also soft, plaintive "pit" or "whit", occasionally followed by musical double note.
Habitat. Edge of *Nothofagus* forest, woodland, and in shrubby clearings; also gardens, *Berberis* thickets, along hedgerows and small streams. Also in shrubby vegetation in Tierra del Fuego, where it seems to exploit more open habitats than on mainland of S Patagonia. Sea-level to 3050 m, mostly below 1000 m.
Food and Feeding. Insects; reported as also eating fruit, especially in winter. Perches conspicuously on tree branches; drops to ground after prey, less often sallies.
Breeding. Oct-Jan. Nest an open cup of small twigs and grass straws, lined with moss, wool, feathers, hair and similar; one in Argentina with external diameter 19 cm, height 13 cm, internal diameter 7·5 cm, depth 5·5 cm; placed in tree or bush, generally 2-3 m above ground. Clutch 2-3 eggs, sometimes 4; no information on incubation and fledging periods. Parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Mostly resident. S populations of nominate race migratory, move N in May, return in Nov.
Status and Conservation. Not globally threatened. Uncommon to fairly common or common. Occurs in Los Glaciares National Park, in Argentina, and La Campana National Park, in Chile.
Bibliography. Araya & Chester (1993), Belton (1985), Canevari *et al.* (1991), Chebez & Bertonatti (1994), Clark (1986), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2000, 2003), Estades (1999), Fjeldså & Krabbe (1990), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967), Joseph (1996), Marín (2004), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Ridgely & Tudor (1994), Smith & Vuilleumier (1971), Stotz *et al.* (1996), Traylor (1977), Vuilleumier (1985, 1994), Wetmore (1926), Woods (1988).

304. Grey Monjita

Xolmis cinereus

French: Pépoaza cendré **German**: Bartstreif-Nonnentyrann **Spanish**: Monjita Gris

Taxonomy. *Tyrannus cinereus* Vieillot, 1816, hinterland of Rio de Janeiro, Brazil.
Two subspecies recognized.
Subspecies and Distribution.
X. c. cinereus (Vieillot, 1816) - Surinam, E Brazil (Amapá S to Rio Grande do Sul), NE Argentina (Misiones) and Uruguay.
X. c. pepoaza (Vieillot, 1823) - extreme SE Peru (E Madre de Dios) through E Bolivia to SC Brazil (S Mato Grosso do Sul), Paraguay and N Argentina (S to Tucumán and N Buenos Aires).



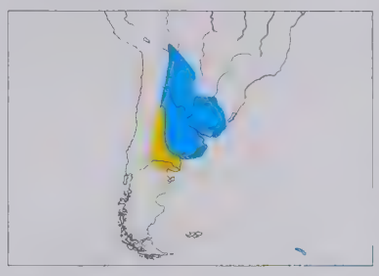
Descriptive notes. 22·5-23 cm; 50-61 g. Plumage is mouse-grey or dusky greyish above, broad white supraloral stripe, narrow white moustachial stripe, broader black submoustachial stripe; wings black, large white speculum at base of primaries (conspicuous in flight), wing-coverts tipped white, tertials edged white; tail black, broadly tipped whitish, outer rectrices tipped white; throat white, breast ashy grey, belly white; iris bright red; bill and legs black. Sexes alike. Juvenile has grey areas tinged brownish, otherwise similar to adult. Race *pepoaza* is very similar to nominate. Voice. Call a high and whistled "pééa"; song "pééehpéééh-ili, dew-dlee-ew", usually at dawn.
Habitat. Grassland and *cerrado*, occasionally around buildings, pastures, and outskirts of major cities; generally, no predilection for water. Often in city centres, sitting on television antennae, buildings and other artificial structures, during migration. Mostly below 1200 m.
Food and Feeding. Insects. Perches conspicuously on fences, bushes and wires; drops to ground after prey; less frequently sallies or runs along the ground. Often remains active even in heat of day. Flight fast, graceful; frequently flies with legs dangling.
Breeding. Little known. Nests found in Jan in Brazil, Dec in Argentina, and Oct and Nov in Urugauy; fledglings in Dec in Surinam. Undulating flight display, repeatedly looping before returning to perch. Nest an open cup of stems and straws, lined with roots, feathers and hair, placed in tree; holes also apparently used. Clutch 2-3 eggs; no information on incubation and fledging periods. Parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Mostly resident. Some S populations migratory; details uncertain.
Status and Conservation. Not globally threatened. Uncommon to common. Common in Sipaliwini Savanna Nature Reserve, in Surinam, and numerous across *cerrado* of Brazil (e.g. around Brasília); apparently less abundant in S part of range. Given its tolerance of converted habitat and its large range, it is not threatened, although rapid destruction of natural grassland and *cerrado* habitats throughout South America should be of concern. Occurs in many national parks and other protected areas.
Bibliography. Babarskas *et al.* (2003), Canevari *et al.* (1991), Clements & Shany (2001), Cory & Hellmayr (1927), Di Giacomo (2004), Dubs (1992), Fjeldså & Krabbe (1990), Haffer (1974), Haverschmidt & Mees (1994), Hayes (1995), Klimaitis & Moschione (1987), López (1997), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Navas & Bó (1993a), Novaes (1978a), de la Peña (1987, 1988), Ridgely & Tudor (1994), do Rosário (1996), Schubart *et al.* (1965), Short (1975), Sick (1993, 1997), Smith & Vuilleumier (1971), Stotz *et al.* (1996), Traylor (1977), Vuilleumier (1994).

305. Black-crowned Monjita

Xolmis coronatus

French: Pépoaza couronné **Spanish**: Monjita Coronada
German: Schwarzkappen-Nonnentyrann

Taxonomy. *Tyrannus coronatus* Vieillot, 1823, Río Plata, Paraguay.
Monotypic.
Distribution. Breeds in C Argentina (San Luis, S Mendoza, La Pampa, S Buenos Aires, Río Negro); migrates N to as far as C Bolivia (W Santa Cruz), W Paraguay and extreme SE Brazil (W Rio Grande do Sul).



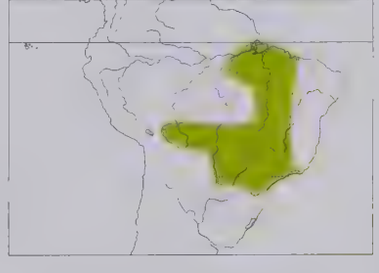
Descriptive notes. 21-22 cm. Has black crown bordered with broad white frontal band, supercilium and nuchal band; ear-coverts blackish; upperparts grey or brownish-grey; wings blackish, wing-coverts with white tips and edges, inner flight-feathers edged whitish, white stripe along base of flight-feathers (conspicuous in flight); tail blackish; entirely white below; iris dark; bill and legs black. Sexes similar, female slightly smaller than male. Voice. Song a soft, melodic "whut-whut, wheeeyr? whut".
Habitat. Open and semi-open areas with scattered bushes and low trees; mostly below 1500 m.
Food and Feeding. Insects. Usually perches on exposed shrub, tree or wire. Drops to ground to take prey, occasionally sallying or running. Generally wary.
Breeding. Sept-Dec. Nest an open cup of small twigs and grass, lined with wool, hair and feathers, placed in tree or bush, normally beneath a furnariid structure; one had top part elliptical, 14 × 23 cm, height 10 cm, interior 7·5 × 9·5 cm, depth 5 cm, placed 1·6 m above ground, near main trunk, 60 cm beneath old nest of cachalote (*Pseudoseisura*), another was similar to mockingbird (*Mimus*) nest but rather loose, smaller and flattened, external diameter 18 cm, height 9 cm, internal diameter 9 cm, depth 5·5 cm, 1·8 m from ground and 20 cm beneath an old furnariid construction. Clutch 2-3 eggs; incubation c. 16 days; fledging 13-16 days.
Movements. Migrant. After breeding, migrates N through remainder of Argentina (except Misiones) N to S Bolivia (W Santa Cruz), W Paraguay, Uruguay, and extreme S Brazil (W Rio Grande do Sul).
Status and Conservation. Not globally threatened. Uncommon to fairly common. May occasionally breed farther N, to W Tucumán.
Bibliography. Babarskas *et al.* (2003), Blake, E.R. (1953), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Di Giacomo (2004), Forrester (1993), Hayes (1995), Joseph (1996), Meyer de Schauensee (1982), Mezquida (2002), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1988, 1997), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Vuilleumier (1994).

306. White-rumped Monjita

Xolmis velatus

French: Pépoaza voilé **German**: Weißbinden-Nonnentyrann **Spanish**: Monjita Velada

Taxonomy. *M[uscicapa] velata* M. H. K. Lichtenstein, 1823, São Paulo, Brazil.
Monotypic.
Distribution. NC to SE Brazil (lower Amazon E to Maranhão, S to Santa Catarina, extending W to S Mato Grosso and Mato Grosso do Sul), N & C Bolivia (Beni E to Santa Cruz) and NE Paraguay.



Descriptive notes. 19-20 cm. Head is mostly white, hindneck pearly grey; back brownish-grey, contrasting white rump and basal half of tail, terminal half of tail black; wings blackish, white band at base of flight-feathers (wingstripe in flight), patch of white on inner secondaries and tertials; all white below; iris dark; bill black; legs dusky blackish. Sexes similar. Voice. Mostly silent; dawn song an intense "jeww", repeated at intervals of 1-5 seconds; single whistle sometimes given at night.
Habitat. Savannas and semi-open areas with scattered bushes and trees, usually near water; often around ranch buildings and outskirts of towns. Below 1000 m.

On following pages: 307. White Monjita (*Xolmis irupero*); 308. Salinas Monjita (*Xolmis salinarum*); 309. Rusty-backed Monjita (*Xolmis rubetra*); 310. Black-and-white Monjita (*Xolmis dominicanus*); 311. Black-billed Shrike-tyrant (*Agriornis montanus*); 312. White-tailed Shrike-tyrant (*Agriornis andicola*); 313. Great Shrike-tyrant (*Agriornis lividus*); 314. Grey-bellied Shrike-tyrant (*Agriornis micropterus*); 315. Lesser Shrike-tyrant (*Agriornis murinus*).

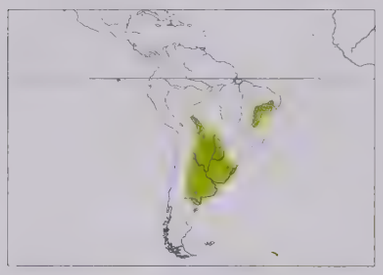
Food and Feeding. Little known. Insects. Usually in pairs, perching conspicuously on fence posts, wires and tops of bushes; generally tame and approachable. Drops to the ground from low perch, or hovers. Often occurs with *X. cinereus*.
Breeding. No information.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common. Occurs in many national parks and other protected areas throughout its reasonably large range; tolerant of converted habitat.
Bibliography. Bauer & Pacheco (2000), Cory & Hellmayr (1927), Dubs (1992), Forrester (1993), Haffer (1974), Hayes (1995), Hennessey, Herzog & Sagot (2003), Meyer de Schauensee (1982), Ridgely & Tudor (1994), do Rosário (1996), Schubart *et al.* (1965), Sick (1993, 1997), da Silva *et al.* (1997), Stotz *et al.* (1996), Vuilleumier (1994).

307. White Monjita

Xolmis irupero

French: Pépoaza irupéro **German**: Weißnonnentyrann **Spanish**: Monjita Blanca

Taxonomy. *T[yrannus] irupero* Vieillot, 1823, Río Plata, Paraguay.
Two subspecies recognized.
Subspecies and Distribution.
X. i. irupero (Vieillot, 1823) - E Bolivia, NE & C Argentina (S to Mendoza, San Luis and Río Negro), Paraguay, S & SE Brazil (Mato Grosso do Sul, Rio Grande do Sul) and Uruguay.
X. i. niveus (Spix, 1825) - E Brazil (Ceará and Pernambuco S to Bahia and N Minas Gerais).



Descriptive notes. 17-18 cm. Male is pure white, except for black primaries, primary coverts and tip of notched tail; iris dark brown; bill and legs black. Female is tinged grey on back. Race *niveus* is slightly smaller than nominate, with wider black tailband. Voice. Usually silent; weak "ghiks" a whining "piew"; breeding male has soft, repeated dawn song, "preeeyp tooit preeeyp tooit".
Habitat. Savannas, open and semi-open grassland, and pastures with scattered trees and bushes, often along roads or near houses; often near marshes or open water. Mostly below 1000 m, but to 1300 m in Bolivia.
Food and Feeding. Insects. Perches conspicuously on treetops, bushes and wires; hides among dense and spiny vegetation if threatened or chased. Drops to ground in pursuit of insects; sometimes hovers (often hanging motionless for considerable periods) before swooping down to take prey.
Breeding. Sept-Dec in Argentina; nest in Nov and another being built in Aug in Uruguay. Nest a large open cup of twigs, grass and similar, lined with feathers and other soft material, 3 m above ground in tree hollow or in abandoned nest (mainly of furnariid); one nest in Argentina was 1·7 m up in hollow of willow (*Salix*), external diameter 6·5 cm, height 7 cm, internal diameter 4·5 cm, depth 4·5 cm, hollow was 25 cm in depth, maximum width 11 cm, entrance hole 15 cm tall and 7 cm across. Clutch 3-4 eggs; incubation period 12 days; fledging period 17 days. Parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Resident.
Status and Conservation. Not globally threatened. Rare to fairly common or common. Common in pantanal in Paraguay and Argentina; rare in E Brazil (race *niveus*). Occurs in many national parks and other protected areas throughout its range.
Bibliography. Babarskas *et al.* (2003), Canevari *et al.* (1991), Cory & Hellmayr (1927), Cracraft (1985), Di Giacomo (2004), Dubs (1992), Fjeldså & Maijer (1996), Friedmann (1927), Hayes (1995), Klimaitis & Moschione (1987), López (1997), Lowen *et al.* (1996), Meyer de Schauensee (1982), Miserendino (1998), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Narosky *et al.* (1990), Navas & Bó (1993a), Nores *et al.* (1983), de la Peña (1987, 1988), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Veiga *et al.* (2002), Zapata & Martínez (1972).

308. Salinas Monjita

Xolmis salinarum

French: Pépoaza de Salinas **German**: Weißnacken-Nonnentyrann **Spanish**: Monjita Salinera

Taxonomy. *Xolmis rubetra salinarum* Nores and Yzurieta, 1979, Argentina.
Initially described as a race of *X. rubetra*, but probably better treated as a distinct species. The two have sometimes been placed in genus *Neoxolmis*, but this treatment appears to be inappropriate. Monotypic.
Distribution. NC Argentina: E La Rioja, extreme S Catamarca, SW Santiago del Estero and NW Córdoba.



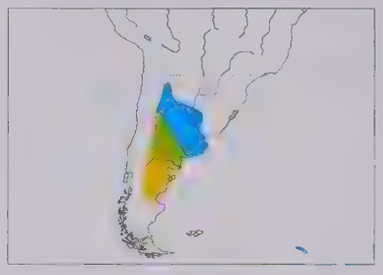
Descriptive notes. 16·5 cm. Male has prominent white supercilium; crown rufous, back rufous-brown, rump greyish-white; wings black, greater and median wing-coverts edged greyish-white, lesser coverts rufescent, tertials edged white; tail mostly black, outer web of three outer rectrices white; side of neck white with faint black streaks, underparts white; iris dark; bill and legs black. Female has neck more streaked. Differs from *X. rubetra* in smaller size, paler coloration, less streaking on neck and breast, very little rufous on flanks. Voice. Unknown.
Habitat. Semi-open scrubby vegetation on salty soils; 100-200 m.
Food and Feeding. Diet unknown, probably insects. Usually in pairs; also small flocks of up to 50 individuals during austral winter. Mainly terrestrial, but also perches on bushes.
Breeding. Unknown.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Locally uncommon to fairly common. Found in small numbers throughout year N of San José de las Salinas, near Salinas Grandes (NW Córdoba). This species' small range is cause for concern, but no other threats are currently known. Research required.
Bibliography. Canevari *et al.* (1991), Chebez (1994), Collar *et al.* (1994), Fjeldså & Krabbe (1990), Lanyon (1986a), Narosky & Salvador (1998), Narosky & Yzurieta (1987, 1993), Nores & Yzurieta (1979), Nores *et al.* (1983), Olrog (1984), Parker *et al.* (1996), Ridgely & Tudor (1994), Smith & Vuilleumier (1971), Stattersfield & Capper (2000), Traylor (1977).

309. Rusty-backed Monjita

Xolmis rubetra

French: Pépoaza traquet **German**: Rotrücken-Nonnentyrann **Spanish**: Monjita Castaña

Taxonomy. *Taenioptera Rubetra* Burmeister, 1860, Sierra de Mendoza; [type from pampa S of Mendoza, near San Carlos and Totoral], Argentina.
Placed in *Myiotheretes* by early authors, and more recently sometimes included with seemingly dissimilar *X. salinarum* in *Neoxolmis*; possibly some affinities with *Agriornis*; further study needed. Monotypic.
Distribution. C Argentina, from Mendoza S to Chubut; winters N to N Argentina.



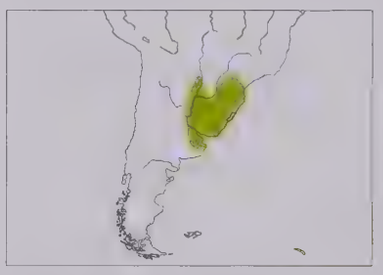
Descriptive notes. 18-19 cm. Male has rufescent crown, prominent long white supercilium, white head side with black streaks; back rufescent or rufous-brown, rump greyish-white; wings long, black, greater and median wing-coverts edged and tipped greyish-white, lesser coverts rufescent, tertials edged white; tail mostly black, outer web of three outer rectrices white; white below, neck side and breast with black streaks, flanks tinged rufous; iris dark; bill and legs black. Female is less rufescent and duller overall than male. Immature is dull buffy above, especially on head, buffish throat and breast. Voice. Little known; adults with fledglings give soft metallic "pik".
Habitat. Steppe and grassland with scattered low bushes (*Larrea*, *Condalia*, *Chuquiraga*); also lake margins. To 1000 m.
Food and Feeding. Insects. Often in pairs or small groups up to five individuals when breeding; flocks of up to 20 or 30 reported in austral winter. Often terrestrial, occasionally perches on wire or low bush; usually drops to the ground from a low perch. Runs swiftly, pauses with head erect; constantly opens and closes tail, and less frequently wings.
Breeding. Little known. Sept-Mar; fledglings in Dec in Chubut. During display male flies up and descends, with wings making metallic rattle. Nest an open cup made of twigs and grass, lined with feathers, internal diameter 12 cm, depth 5 cm, on ground at base of small bush. One nest held 2 chicks. No other information.
Movements. Resident in N. S populations migratory, spending winter (Apr-Aug) in N Argentina (N to Tucumán, Santiago del Estero, Santa Fe and Entre Ríos); one record from extreme W Uruguay (Paysandu).
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Uncommon at Valdés Peninsula, in Chubut. Habitat has been severely altered by overgrazing and deforestation, and native grassland and *Prosopis* forests virtually eliminated over large areas; as a result, the species has declined. Flocks of 20-30 individuals were common in Río Negro in middle of 19th century, whereas today it is fairly rare throughout much of its range. Was locally fairly common in Chubut, La Pampa, Neuquén and Río Negro in 1990s.
Bibliography. Bucher & Nores (1988), Canevari *et al.* (1991), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Fjeldså & Krabbe (1990), Joseph (1996), Lanyon (1986a), Luciano (1998), Meyer de Schauensee (1982), Narosky & Salvador (1998), Nores *et al.* (1983), de la Peña (1988, 1997), Ridgely & Tudor (1994), Smith & Vuilleumier (1971), Stotz *et al.* (1996), Traylor (1977), Vuilleumier (1994), Wetmore (1926).

310. Black-and-white Monjita

Xolmis dominicanus

French: Pépoaza dominicain **Spanish**: Monjita Dominicana
German: Schwarzschwanz-Nonnentyrann

Taxonomy. *T[yrannus] dominicanus* Vieillot, 1823, Río Plata, Paraguay.
Sometimes placed in a monotypic genus, *Heteroxolmis*, on basis of morphological and anatomical data. Monotypic.
Distribution. SW Paraguay, SE Brazil (Paraná, Rio Grande do Sul), Uruguay and NE Argentina (E Formosa and Misiones S to N Buenos Aires).



Descriptive notes. 20-20·5 cm. Male is mostly white, with pale greyish smudging on head and back; wings black, outer third of primaries white; tail rather long, black; iris dark; bill and legs black. Differs from *X. irupero* in larger size, less pure white colour, more black in wings, all-black tail. Female has crown and back brownish-grey, prominent white scapulars and rump. Juvenile has rusty back. Voice. Usually silent; soft, somewhat querulous "weeyrt" or "wurrt" call, especially when agitated.
Habitat. Marshes and bogs with sedge (*Cyperus* and *Eryngium*), open or burned areas, also landward side of coastal sand dunes; often forages in adjoining grassland. Generally below 500 m, occasionally to 1000 m.
Food and Feeding. Insects. Drops from low perch to ground for prey. Foraging birds often associated with Saffron-cowled Blackbird (*Agelaius flavus*) flocks, reasons unknown.
Breeding. Nests found Oct-Dec in SE Brazil (Rio Grande do Sul); late Sept to Dec in Argentina. Nest relatively bulky, substantial open cup of dry grasses, coarse stems and often some leaves, lined with finer grasses, a few feathers and/or wool, well hidden in low bush within small clump of marsh vegetation, or on clump of grass; five nests had mean length c. 16·4 cm, width 11·4 cm, height 7·5 cm, cup width 8·5 cm, cup depth 4·8 cm. Clutch 3-4 eggs; no information on incubation and fledging periods. Parasitized by Shiny Cowbird (*Molothrus bonariensis*).

Movements. Resident.
Status and Conservation. VULNERABLE. Rare to uncommon, and very local. Somewhat more numerous locally, e.g. in NE Rio Grande do Sul (Brazil) and N of Pinamar in E Buenos Aires (Argentina), but in general now extremely scarce. Since 1850, this species' population has undergone a catastrophic decline within its range of c. 120,000 km², this due mainly to drainage and agricultural conversion of natural grasslands, especially for livestock grazing; more recently, afforestation with non-native trees has begun to replace even more grasslands, especially rapidly in Entre Ríos and Corrientes (Argentina), where the species is still relatively common in recently burnt areas and has also been found in old paddyfields. Further threats are destruction of nests by fires and high levels of brood parasitism by Shiny Cowbird. Current stronghold possibly in SE Uruguay, with c. 1500-2200 individuals, mostly in Rocha; in Brazil common only near Arcos (Minas Gerais), in SE Santa Catarina and in NE & SE Rio Grande do Sul; in Argentina, decline especially marked in Buenos Aires, where previously common (and still is N of Pinamar), and most recent records from Corrientes and Entre Ríos. Occurs in Chaco, Mburucuyá and El Palmar National Parks, San Juan de Poriahú and Campos del Tuyú Private Reserves and Ribera Norte Municipal Reserve, all in Argentina. Aparados da Serra and São Joaquim National Parks, in Brazil, and Bañados del Este Biosphere Reserve and Laguna de Castillos, Potrerillo de Santa Teresa and Los Indios Reserves, all in Uruguay.
Bibliography. Belton (1985), Canevari *et al.* (1991), Chebez (1994), Collar & Andrew (1988), Collar *et al.* (1994), Contreras (1995b), Cory & Hellmayr (1927), Di Giacomo & Krapovickas (2001), Fontana (1997), Fontana & Voss (1995), Fraga (2003), Lanyon (1986a), Meyer de Schauensee (1982), Narosky & Di Giacomo (1993), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Navas & Bó (1993a), Orians (1978), Pearman & Abadie (1995), de la Peña (1988), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sick (1993, 1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Suertegaray (1997), Tobias *et al.* (1993), Vuilleumier (1994).

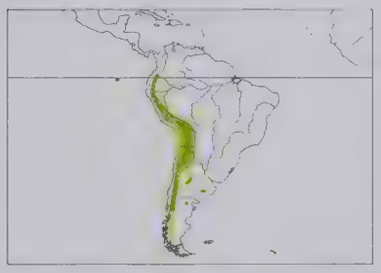
Genus *AGRIORNIS* Gould, 1839

311. Black-billed Shrike-tyrant

Agriornis montanus

French: Gaucho à bec noir **German**: Schwarzschnabel-Hakentyrann **Spanish**: Gaucho Serrano
Other common names: Black-billed Ground-tyrant

Taxonomy. *P[epoaza] Montana* d'Orbigny and Lafresnaye, 1837, Chuquisaca, Bolivia.
Race *intermedius* is likely to be a clinal variant of *insolens*, nominate and *maritimus*, as it is phenotypically and geographically intermediate between these three races and does not exhibit a constant set of diagnosable features. Described race *leucurus* (from Patagonia) merged with *maritimus*, from which it appears indistinguishable. Five subspecies currently recognized.
Subspecies and Distribution.
A. m. solitarius P. L. Sclater, 1859 - Andes of S Colombia and Ecuador.
A. m. insolens P. L. Sclater & Salvin, 1869 - temperate zone of Peru.
A. m. intermedius Hellmayr, 1927 - W Bolivia (La Paz, Oruro) and N Chile (Tarapacá).
A. m. montanus (d'Orbigny & Lafresnaye, 1837) - E & S Bolivia and NW Argentina (Jujuy S to Tucumán and La Rioja).
A. m. maritimus (d'Orbigny & Lafresnaye, 1837) - Andes of C & S Chile (Tarapacá to Magallanes) and WC & SW Argentina (W Mendoza to W Santa Cruz); also C Argentina, in hills of Córdoba, S Buenos Aires and Somuncará Plateau.



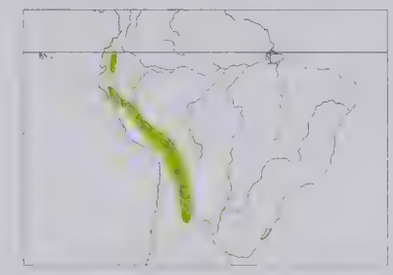
Descriptive notes. 23-24 cm. Nominate race has indistinct whitish supraloral stripe, narrow and broken buffish-white supercilium; cheek white, streaked dark brown; mainly dark greyish-brown above; inner remiges edged and tipped whitish; central pair of tail feathers blackish, remainder white (conspicuous in flight) with dark inner webs basally; white throat narrowly streaked blackish, breast and flanks ashy brown, whitish tinge on mid-belly, whitish lower belly and vent; underwing-coverts cinnamon-buff to buffy white; iris yellowish to ivory; bill hooked, black; legs blackish. Sexes alike. Juvenile is like adult, but base of lower mandible pale to yellowish. Race *solitarius* is darker than nominate, outer tail all white; *insolens* is somewhat paler than previous, four outer pairs of rectrices white, sometimes narrow dusky margin along inner web of fourth (and, rarely, third) pair; *maritimus* has whitish tips of central tail feathers, more black at base of tail feathers, S populations ("*leucurus*") also darker on underparts than nominate; *intermedius* is similar to previous, but lateral rectrices with much less black at base, two outermost pairs sometimes wholly white. VOICE. Sometimes fairly vocal, especially at dawn, though often silent: call a loud, whistled "wheee, wheeeu", rising and then falling, or just "wheeeu"; also a loud whistled "pyuk". Male clicks bill during territorial disputes, attenuated outer primaries produce low-pitched, almost inaudible whirring sound during aerial display.
Habitat. Mainly high open places in Andes. Wide-ranging in open grassy and agricultural areas with scattered bushes and trees in upper temperate zone and *páramo*, edge of *Polylepis* forest, *puna* grassland with fence posts or scattered rocks and boulders, rocky slopes and cliffs, villages, ploughed fields; also around buildings. May roost in caves. Mainly 3000-4000 m, locally down to 2000 m and up to 4500 m; as low as 1830 m in Peru, and, rarely, breeds down to sea-level in Chile (Tarapacá S to Coquimbo).
Food and Feeding. Large insects, small mammals, lizards, frogs, eggs or nestlings of other birds, and seeds. Perches conspicuously on rocky outcrops or bushtops, taking most prey from the ground or by hawking; sometimes approachable, but often flies long distances when flushed. Glides slowly from rock to rock when hunting, sometimes hovering briefly, and drops down on to any prey spotted. Runs well, and sometimes pumps tail up and down.
Breeding. Nests found in Dec-Jan in Argentina; eggs in Nov in N & C Chile; nestlings in Oct in S Peru (Arequipa); juveniles in Dec-Jan and Aug and food-carrying adults in mid-Aug in Ecuador; juveniles in Dec (Junín, Amazonas), Mar (Cuzco) and May (W La Libertad) in Peru, and Feb and Apr in Bolivia (Cochabamba). Male performs aerial display. Nest a large loosely made open cup of dry sticks and grass, lined with wool, one with diameter 15 cm, height 9 cm and depth 4 cm; placed on ground or vegetation in *páramo*, or in rock crevice, low in bush near stream, under tile roof, or in mud wall of house. Clutch 2-3 eggs; no information on incubation and fledging periods.
Movements. Mainly resident, but populations of far S move N for winter.
Status and Conservation. Not globally threatened. Uncommon to fairly common; most numerous and widespread member of genus in Andes. Occurs in e.g. Machu Picchu Historical Sanctuary and Huascarán and Sajama National Parks, in Peru, and Lauca National Park, in Chile. Densities not very high, as it appears to have large territories.
Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chebez (1994), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Hilty & Brown (1986), Hoy (1976), Jaramillo (2003), Johnson, A.W. (1965, 1967), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rocha & Peñaranda (1995), Rocha & Quiroga (1996), Salaman (1994), Smith & Vuilleumier (1971), Stotz *et al.* (1996), Vuilleumier (1994), Wetmore (1926), Zimmer (1930).

312. White-tailed Shrike-tyrant

Agriornis andicola

French: Gaucho à queue blanche **Spanish**: Gaucho Andino
German: Weißschwanz-Hakentyrann

Taxonomy. *Agriornis andicola* P. L. Sclater, 1860, Panza, Ecuador.
Species formerly referred to sometimes as *A. albicauda*, as current name was considered, erroneously, to be preoccupied. Races poorly differentiated. Two subspecies recognized.
Subspecies and Distribution.
A. a. andicola P. L. Sclater, 1860 - Ecuador.
A. a. albicauda (R. A. Philippi [Krumwiede] & Landbeck, 1863) - Peru, W Bolivia, N Chile and NW Argentina.



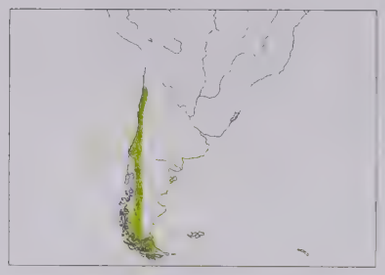
Descriptive notes. 25-28 cm. Has narrow buff supercilium, streaked head side; dark grey-brown above, some pale margins on wings; central tail feathers like back, remainder white with small dark markings at tips; throat white, streaked blackish; upper breast and sides grey-brown, lower breast, belly and vent whitish, irregularly tinged buff; underwing-coverts cinnamon-buff; iris dark; bill large, heavy, powerfully hooked, upper mandible dark, lower mandible pale horn-coloured to yellowish; legs blackish. Distinguished from similar *A. montanus* by larger size and bulkier shape, dark iris, heavier bill with pale yellowish lower mandible, markedly sharper and blacker throat streaking. Sexes similar. Race *albicauda* is very similar to nominate. VOICE. Call a surprising and loud, melodic "teeu, tcheeu-tcheeu-tcheeuw!", with many variations. Adult male's attenuated two outer primaries produce low-pitched whirring sound during aerial display.
Habitat. *Páramo*, *puna* and montane scrub and areas having sparse and xeric vegetation of low shrubs, with *Puya* shrubs, scattered rocks or boulders for perching; also around buildings and walls. Also found in open farmland with eucalypt (*Eucalyptus*) trees locally in Ecuador (W of Saragura). Above 2450 m in Ecuador (nominate race); 3660-4500 m from Peru and Bolivia S (*albicauda*).
Food and Feeding. Large insects, small mammals, lizards, frogs, eggs or nestlings of other birds. Perches conspicuously on rocky outcrops or on bushes, taking most prey from the ground, or by hawking in the air. Sometimes occurs together with *A. montanus*.
Breeding. Birds with enlarged gonads in Jun in NW Ecuador. Male during aerial display circles silently, alternately rising to partial stall and dropping forward on closed wings. No other information.
Movements. Resident.
Status and Conservation. VULNERABLE. Very rare and local. Was apparently once much more numerous, but has declined in recent decades. Total population of a few thousands becoming increasingly fragmented in its relatively large range. Reasons for scarcity and decline somewhat unclear; this species could be especially sensitive to habitat modification such as clearing of bushy vegetation, as stands of large *Puya raimondii* (required for nesting) are actively destroyed by sheep-farmers, or could be unusually prone to persecution (e.g. hunting with slings). Has been recorded (sometimes not for several decades) in Podocarpus National Park, in Ecuador, Salinas y Aguada Blanca National Reserve and Huascarán National Park, in Peru, and Lauca National Park, in Chile. In Argentina, a few individuals found recently in Sierra de Aconquija above Tafi del Valle (Tucumán), in the "Campo de los Alisos" conservation area. Scattered records from unprotected sites throughout its range, but everywhere it appears rare and outnumbered by *A. montanus*, which may outcompete it in some unknown manner. Appears locally extinct in N Ecuador, although described as common around Quito in middle of 19th century (but perhaps confused with *A. montanus*). Further surveys at additional localities are needed.
Bibliography. Araya & Chester (1993), Begazo *et al.* (2001), Canevari *et al.* (1991), Chebez (1994), Clements & Shany (2001), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Herzog *et al.* (1999), Howell & Webb (1995b), Jaramillo (2003), Johnson (1967), Krabbe *et al.* (1996), Marín (2004), Pacheco (2002a), de la Peña (1988), Pulido (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996), Vuilleumier (1994), Wege & Long (1995), Zimmer (1930, 1937a).

313. Great Shrike-tyrant

Agriornis lividus

French: Grand Gaucho **German**: Schwarzschwanz-Hakentyrann **Spanish**: Gaucho Grande

Taxonomy. *Tamnophilus* [sic] *lividus* Kittlitz, 1835, mountains of Valparaíso, Chile.
Two subspecies recognized.
Subspecies and Distribution.
A. l. lividus (Kittlitz, 1835) - coast and mountains of Chile (Atacama S to Valdivia).
A. l. fortis Berlepsch, 1907 - S Chile (Aisén and Magallanes) and S Argentina (L Nahuel Huapi, in S Chubut, S to Tierra del Fuego).
Descriptive notes. 26-28 cm. The largest flycatcher. Has dark head, ear-coverts tinged cinnamon, some whitish mottling on lores; mostly dull greyish-brown above; wings duskier, wing feathers obscurely edged pale brown; tail black, narrow tip and outer web of outer feather buffy white; throat white, sharply streaked black; underparts slightly paler greyish-brown, lower belly and,



especially, crissum washed cinnamon or cinnamon-buff; iris dark; bill heavy, strongly hooked, upper mandible black, lower mandible pale horn and becoming darker at tip; legs blackish. Sexes alike. Juvenile is browner and indistinctly streaked dusky on head, back and upper breast, has much less streaking on throat, entire belly cinnamon-buff. Race *fortis* is somewhat larger than nominate, and overall very slightly brighter. Voice. Usually silent; call "t-eek" or "t-eek-ek". Adult male's attenuated two outer primaries produce low-pitched, almost inaudible whirring sound during aerial display.

Habitat. Semi-open shrubby and agricultural regions; avoids both very xeric and very wet habitats, as well as wooded or heavily populated areas. Found in sub-arid countryside with large patches of bushes, thick scrub (such as *Chiliotrichium amelloideum*), cacti and bromeliads; open flats, pastures dotted with bushes on surrounding slopes, trees in transitional *Nothofagus* forest. Sea-level to 1800 m, mostly below 1500 m.

Food and Feeding. Large insects, small mammals, lizards, frogs, eggs or nestlings of other birds; rarely small birds, including *Anairetes parulus*. Occurs in highly dispersed pairs. Perches conspicuously on rocky outcrops or in bushtops, taking most prey from the ground, or by hawking in air.

Breeding. Oct (coastal) and Nov (interior) in Chile. Male has aerial display. Bulky cup-shaped stick nest, lined with grass and wool, placed in bush or cactus. Clutch 2-4 eggs, usually 3. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon, becoming rare in S part of range. Most common in C Chile (from Aconcagua S to Bío Bío) and in SC Patagonia (Chubut and Aisén). Found in many national parks within its range.

Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Clark (1986), Cofré & Vilina (1999), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Cracraft (1985), Fjeldså & Krabbe (1990), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Núñez (1995), de la Peña (1988), Ridgely & Tudor (1994), Stotz *et al.* (1996), Vuilleumier (1994).

314. Grey-bellied Shrike-tyrant

Agriornis micropterus

French: Gaucho argentin **German**: Weißbrauen-Hakentyrann **Spanish**: Gaucho Gris

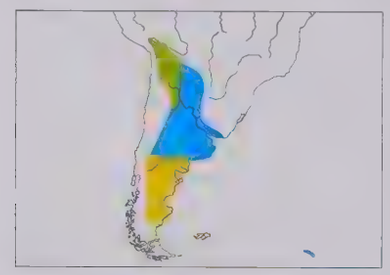
Taxonomy. *Agriornis micropterus* Gould, 1839, Port Desire, Patagonia, Argentina.

Two subspecies recognized.

Subspecies and Distribution.

A. m. andecola (d'Orbigny, 1840) - temperate zone of S Peru, Bolivia (La Paz, Cochabamba, Oruro, Potosí), N Chile (Tarapacá) and NW Argentina (Jujuy, Salta, Catamarca, Tucumán).

A. m. micropterus Gould, 1839 - breeds Andes of C & S Argentina (Mendoza, La Pampa and S Buenos Aires S to Santa Cruz); S breeders migrate N.



Descriptive notes. 23-24·5 cm. Male nominate race has crown grey-brown, supercilium whitish, ear-coverts tinged rufous; generally grey-brown above, wing-coverts pale greyish, flight-feathers edged whitish; tail black, slender white edge of outer feathers; throat and throat side white, heavily streaked black; underparts pale brown, belly pale grey-brown to whitish, flanks washed buffy; iris dark; bill strong, straight, hook-tipped, upper mandible dark brown, lower mandible orange; legs dusky. Female has throat streaked dark brown. Juvenile is browner, underparts pale cinnamon-brown, throat markings more or less absent. Race *andecola* is larger than nominate, slightly darker, vent tinged tawny. Voice. Usually silent; male pursuing another gives high-pitched petulant calls; also high-pitched whistle in breeding season. Adult male's two attenuated outer primaries produce low-pitched, almost inaudible whirring sound during aerial display.

Habitat. Open shrubby steppes (with *Baccharis*), hillsides, and *puna* grassland with some shrubbery and boulders; also in open agricultural areas in austral winter. Sea-level to 5000 m; mostly 2000-4000 m in N part of range, regularly to sea-level in S.

Food and Feeding. Large insects, small mammals, lizards, frogs, and eggs or nestlings of other birds. Perches conspicuously on rocks or in bushtops; takes most prey from the ground or by hawking in air; often runs along ground while picking up insects, occasionally flying to catch insects on the wing. Often flies long distances low over ground.

Breeding. Eggs in Jan in Chile (Tarapacá); nests found in Sept and Oct and eggs and begging fledgling in Dec in Argentina. Male has aerial display. Nest bulky, cup-shaped, mostly of sticks and large twigs, one with external diameter 20 cm, height 9·5 cm, internal diameter 9·5 cm, depth 6·5 cm, corresponding dimensions of another 11 cm, 9 cm, 8 cm and 7 cm; placed 1 m or more above ground in bush, in one case *Condalia microphylla*. Clutch 3-4 eggs; no information on incubation and fledging periods. Parasitism by Shiny Cowbird (*Molothrus bonariensis*) recorded once in Argentina.

Movements. Resident in N (*andecola*). S population (nominate) migrates N in austral winter (at least Jun-Oct), spreading over much of Argentina and occurring N at least casually to Bolivia (Cochabamba); leaves breeding grounds in Feb, spends non-breeding period from S Bolivia, Paraguay (rare but regular) and Uruguay (very rare, no recent records) S to Córdoba and N Buenos Aires.

Status and Conservation. Not globally threatened. Generally uncommon, locally fairly common. Fairly common in N Chile (Collacagua Valley and around San Pedro de Atacama), but apparently scarce elsewhere.

Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chesser (1997), Clements & Shany (2001), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Cracraft (1985), Di Giacomo (2004), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Flores & Capriles (1998), Harris (1998), Hayes (1995), Howell & Webb (1995b), Joseph (1996), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1988), Ridgely & Tudor (1994), Stotz *et al.* (1996), Vuilleumier (1994), Zapata & Martínez (1972), Zimmer (1937a).

315. Lesser Shrike-tyrant

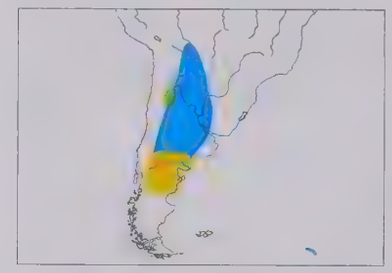
Agriornis murinus

French: Gaucho souris **German**: Kleinhakentyrann **Spanish**: Gaucho Chico
Other common names: Least/Mouse-brown Shrike-tyrant

Taxonomy. *P[epoaza] Murina* d'Orbigny and Lafresnaye, 1837, Río Negro, Argentina.

Formerly placed in *Xolmis* by some authors on grounds of shared behavioural traits and morphological similarities, but nowadays normally included in present genus, which it closely resembles in plumage colour and pattern; this species appears to be somewhat intermediate between the two genera, thus supporting their possible merging; further study required. Monotypic.

Distribution. Breeds in NW & SC Argentina (Catamarca, Tucumán and La Rioja, and from Neuquén, Río Negro and SW Buenos Aires S to Santa Cruz; may also breed in intervening zone); winters N as far as C Bolivia.



Descriptive notes. 16-18·5 cm. Has crown grey-brown, supercilium and eyering whitish, lores mixed blackish and white; upperparts grey-brown, wings dusky with whitish tips of wing-coverts, whitish edge of inner primaries; tail dusky, outer web of outermost feather pair greyish (appears black in flight); throat white with contrasting black streaks, becoming very pale greyish-brown on breast and creamy whitish on belly, often tinged buff on flanks; iris dark; bill rather slender, slightly hooked, black; legs blackish. Sexes similar, but female has throat streaking somewhat browner Voice. Usually silent; during pursuits gives sharp squeaky notes; occasional high-pitched whistle-like call. Adult male's attenuated outermost primaries produce low-pitched, almost inaudible whirring sound during aerial display.

Habitat. Open plains with dry scrub and scattered trees during breeding season; also agricultural areas in non-breeding period. Sea-level to 2500 m; at highest altitudes usually in austral winter in Bolivia.

Food and Feeding. Large insects, small mammals, lizards, frogs, and eggs or nestlings of other birds. Generally forages alone. Usually perches on top of shrubs, dropping to the ground and occasionally running rapidly to take prey; sometimes hawks in short flights. When running (sometimes for considerable distances), often stops and then cocks head to one side to inspect surroundings.

Breeding. One nest found in Nov, a cup made of stems, lined with grass and feathers, external dimensions 12 × 13·5 cm, height 7 cm, internal diameter 7·5 cm, depth 4·5 cm; placed 40 cm above ground in *Heterostachys* bush; contained 3 eggs. No other information.

Movements. Migratory. After breeding migrates N; spends austral winter (May-Sept) in much of rest of Argentina (except far NE) and N to W Paraguay and C & S Bolivia (N to Cochabamba and W Santa Cruz).

Status and Conservation. Not globally threatened. Uncommon to fairly common. No obvious potential threats. Survey work required in order to establish precise limits of breeding range.

Bibliography. Andors & Vuilleumier (1996), Canevari *et al.* (1991), Chesser (1997), Couve & Vidal-Ojeda (2003), Cracraft (1985), Di Giacomo (2004), Fjeldså & Krabbe (1990), Harris (1998), Hayes (1995), Joseph (1996), Meyer de Schauensee (1966, 1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Smith & Vuilleumier (1971), Stotz *et al.* (1996), Wetmore (1926), Zapata & Martínez (1972).

PLATE 39 ➤



PLATE 39

inches 4

cm 10

Genus *MUSCISAXICOLA*

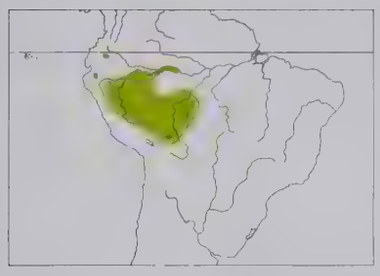
d'Orbigny & Lafresnaye, 1837

316. Little Ground-tyrant

Muscisaxicola fluviatilis

French: Dormilon fluviatile **German**: Tiefland-Grundtyrann **Spanish**: Dormilona Enana

Taxonomy. *Muscisaxicola fluviatilis* P. L. Sclater and Salvin, 1866, lower River Ucayali, Peru.
Usually considered closely allied with *M. maculirostris*; recent phylogenetic work, however, suggests that this species may be more closely related to other taxa (e.g. *Muscigralla*) than it is to current congeners. Monotypic.
Distribution. Extreme SE Colombia, E Ecuador and E Peru (N bank of R Marañón S to R Inambari) to W Brazil (E to middle R Amazon and upper R Madeira region) and NW & C Bolivia (to Cochabamba).



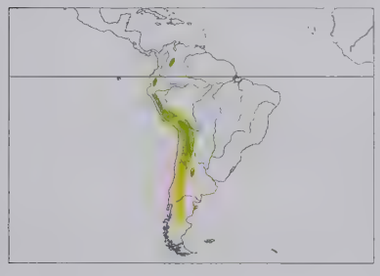
Descriptive notes. 13-14 cm. Has pale buffy supraloral line and eyering; above, greyish and sandy brown, wings dusky, inner remiges very narrowly edged pale greyish-cinnamon or rufescent, greater wing-coverts with narrow buffy tips (sometimes showing vague rufescent wingbars); tail black, outer web of outer feathers white; throat and breast buffy white, belly lighter; iris dark brown; bill mainly black, base of lower mandible pale fleshy yellow or orange-yellow; legs blackish. Distinguished from *M. maculirostris* by proportionally shorter tail, reduced white supraloral, contrasting white belly. Sexes alike. Voice. Usually quiet; call a single high-pitched "peeeép" with rising inflection.
Habitat. Open or sparsely vegetated sandbars and river islands; sometimes in adjacent open grassy areas. The only ground-tyrant in lowlands of Amazonia. Mostly below 800 m; rarely to 1400 m in Ecuador, 1900 m in Peru; very occasionally perhaps higher, to 3200-3800 m in Bolivia (although these specimens appear to be anomalous).
Food and Feeding. Insects. Usually found singly or in pairs, running in open, though rather inconspicuous (dorsal coloration similar to that of usual sandy habitat). Sometimes associated with migrant shorebirds. Mainly terrestrial, making short runs and hops after prey, stopping suddenly and standing erect; less frequently, sallies from the ground or a rock.
Breeding. Aug-Oct in SE Peru. Nest is inconspicuous cup of weeds and twigs on ground amongst emerging *Tessaria* on large sandy beaches. Clutch 2 eggs.
Movements. Resident. Some possible movement; e.g. records at highland localities, e.g. in Colombia, Ecuador and Bolivia (L Titicaca, 3800 m), may involve vagrants.
Status and Conservation. Not globally threatened. Uncommon and local. Occurs in e.g. Tambopata-Candamo Reserved Zone and Manu National Park and Biosphere Reserve, in Peru, Pilón Lajas Biosphere Reserve and Madidi National Park, in Bolivia, and Mamirauá Reserve (Amazonas), in Brazil.
Bibliography. Allen (1995), Chapman (1921), Chesser (2000), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fitzpatrick (1980c, 1981, 1985a), Fjeldså & Krabbe (1990), Hennessey, Herzog, Kessler & Robinson (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Pacheco (1995), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Schulenberg *et al.* (2001), Sick (1993, 1997), Smith & Vuilleumier (1971), Stotz *et al.* (1996), Terborgh *et al.* (1984), Zimmer (1930).

317. Spot-billed Ground-tyrant

Muscisaxicola maculirostris

French: Dormilon à bec maculé **Spanish**: Dormilona Chica
German: Schnabelfleck-Grundtyrann

Taxonomy. *M[uscisaxicola] maculirostris* d'Orbigny and Lafresnaye, 1837, La Paz, Bolivia.
Usually considered closely allied with *M. fluviatilis*; recent phylogenetic work, however, does not suggest so close a relationship. Three subspecies recognized.
Subspecies and Distribution.
M. m. niceforoi J. T. Zimmer, 1947 - N part of E Andes of Colombia.
M. m. rufescens Berlepsch & Stolzmann, 1896 - Ecuador.
M. m. maculirostris d'Orbigny & Lafresnaye, 1837 - breeds Peru, Bolivia, Chile and W Argentina (Jujuy S to Santa Cruz); S populations migrate N.



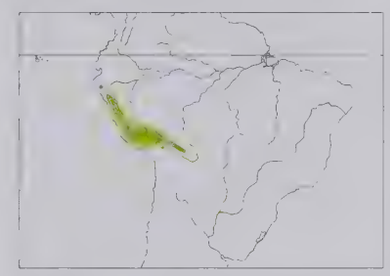
Descriptive notes. 14-15 cm. Smallest highland ground-tyrant. Nominate race has short buffish-white supercilium, dusky line through eye; smoky grey with brownish tinge above, wings duskier with cinnamon-buff edging; tail black, outer web of outer feather pair whitish; throat dusky whitish, underparts uniform buffy white; iris dark brown; bill black, base of lower mandible yellowish to orange-yellow ("spot-billed"); legs black. Differs from *M. fluviatilis* in proportionally longer tail, stronger supercilium, more uniform underparts. Sexes alike. Juvenile has wings edged cinnamon. Race *niceforoi* is much like nominate, but with more cinnamon-buff underparts; *rufescens* is more rufous-brown, underside cinnamon-buff, underwing-coverts tawny-buff. Voice. In aerial display "t-t-tk-tk" and "wheeoo", repeated up to 15 times; also utters short "tek".
Habitat. Xeric barren areas with sparse bushy vegetation, preferring steep rocky slopes, banks or walls; occasionally along shores of high lagoons but, unlike congeners, shows no affinity for water. At 1000-4000 m, occasionally wandering down to sea-level.
Food and Feeding. Insects. Usually singly or in pairs; less often in small and loose groups during non-breeding period; less conspicuous than other ground-tyrants. Mainly terrestrial, making short runs and hops after prey, stopping suddenly and standing erect; less frequently, sallies from the ground or a rock. Regularly perches on bushtops, walls and half-way up banks.
Breeding. Generally Oct-Mar; Jun-Jul in Ecuador and Colombia, eggs in Oct-Nov in Chile, and nests in Dec-Jan and fledgling in Feb in Argentina. Occasionally loose "colonies" in particularly favourable habitat. In aerial display, with calling, flutters up, stalls and then swoops to ground. Nest an open cup, made from dry grass, lined with small feathers, exposed or partially concealed on ground, especially near bush, grass tuft or rock. Clutch 2-4 eggs; no information on incubation and fledging periods.
Movements. Mostly resident; at least a partial migrant in S portion of range, most birds moving N after breeding.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Apparently less abundant in N & S than in C parts of range; isolated N race *niceforoi* is included on Colombian red list as "endangered". Occurs in e.g. Machu Picchu Historical Sanctuary, in Peru, and Eduardo Avaroa National Park, in Bolivia, and most national parks in S Andes.
Bibliography. Araya & Chester (1993), Cadena & Renjifo (2002), Canevari *et al.* (1991), Chapman (1921), Chesser (1997, 2000), Clements & Shany (2001), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Flores & Capriles (1998), Hennessey, Herzog, Kessler & Robinson (2003), Hilty & Brown (1986), Jaramillo (2003), Johnson, A.W. (1965, 1967), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1988), Quiroga *et al.* (1998), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Rocha & Quiroga (1996, 1998), Smith & Vuilleumier (1971), Stotz *et al.* (1996), Varty *et al.* (1986), Walker (2001), Wetmore (1926), Zimmer (1930).

318. Taczanowski's Ground-tyrant

Muscisaxicola griseus

French: Dormilon gris **German**: Graubrust-Grundtyrann **Spanish**: Dormilona de Taczanowski

Taxonomy. *Muscisaxicola grisea* Taczanowski, 1884, Maraynioc, Peru.
Formerly considered conspecific with *M. alpinus*; recent molecular work supports treatment as distinct species. Monotypic.
Distribution. Peru and NW & C Bolivia (La Paz, Cochabamba).



Descriptive notes. 18-19 cm. Has long white supercilium extending beyond eye, small white area below eye, dusky lores; crown brownish-grey, slightly streaked appearance; upperparts pure smoky grey, wings duskier, some pale edging on wing-coverts; tail blackish, outer feather narrowly edged white; throat white, breast grey, abdomen white with buff tinge; iris dark; bill and legs black. Differs from *M. alpinus* in lacking brownish wash above and faint sepia on crown. Sexes alike. Voice. Unknown.
Habitat. Open *páramo* or *puna* grassland; level or gently sloping grassy soil, sometimes on dry, sparsely vegetated ground. At 2700-4800 m.
Food and Feeding. Insects. Mainly terrestrial; forages with short runs and hops, stopping suddenly and standing erect (though less erect than congeners), and occasionally taking a slightly elevated perch; less frequently, sallies from the ground or a rock. Swift and direct flight, sometimes flicking tail and quivering or drooping wings upon landing. Regularly in loose flocks in non-breeding season, occasionally with other ground-tyrants or other *puna*-zone birds.
Breeding. Juveniles in Dec in Peru (Puno, Cuzco) and Jan in Bolivia (La Paz). No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally fairly common in limited range. Rather poorly known species.
Bibliography. Chapman (1921), Chesser (1994, 2000), Fjeldså & Krabbe (1990), Hennessey, Herzog & Sagot (2003), Koepcke (1970), Ridgely & Tudor (1994), Walker (2001), Zimmer (1930).

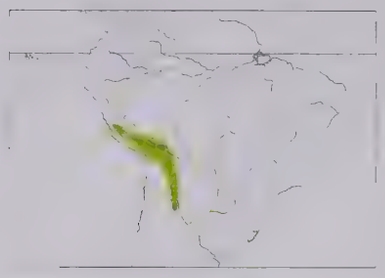
319. Puna Ground-tyrant

Muscisaxicola juninensis

French: Dormilon de Junin **German**: Braunscheitel-Grundtyrann **Spanish**: Dormilona Puneña

Taxonomy. *Muscisaxicola juninensis* Taczanowski, 1884, Junín, Peru.
Has in the past been considered closely related to, and perhaps conspecific with, *M. albilora*. Monotypic.
Distribution. C & S Peru (Junín S to Tacna and Puno), N Chile (Tarapacá), SW Bolivia (La Paz S to Potosí) and NW Argentina (S to W Tucumán).
Descriptive notes. 16·5 cm. Has white supraloral, faint pale supercilium and broken eyering; most of crown tinged dull cinnamon (but lacks distinct coronal patch); upperparts pale brownish-grey, lower rump black, wings dusky grey; tail black, outer web of outer feathers edged white; pale grey below, throat and belly whitish; iris dark; bill and legs black. Distinguished from *M. albilora* by browner (less grey) appearance, less pronounced supercilium, smaller bill. Sexes alike. Juvenile has wing-coverts edged pale cinnamon, underparts buffy. Voice. Unknown.
Habitat. Hillsides and *puna* grassland and grassy steppes, most often close to rock outcroppings, boulders or cliffs; bogs with matted vegetation and slightly drier grass, stones at edge of bogs and

On following pages: 320. Cinereous Ground-tyrant (*Muscisaxicola cinereus*); 321. White-fronted Ground-tyrant (*Muscisaxicola albifrons*); 322. Ochre-naped Ground-tyrant (*Muscisaxicola flavinucha*); 323. Rufous-naped Ground-tyrant (*Muscisaxicola rufivertex*); 324. Dark-faced Ground-tyrant (*Muscisaxicola maclovianus*); 325. White-browed Ground-tyrant (*Muscisaxicola albilora*); 326. Plain-capped Ground-tyrant (*Muscisaxicola alpinus*); 327. Cinnamon-bellied Ground-tyrant (*Muscisaxicola capistratus*); 328. Black-fronted Ground-tyrant (*Muscisaxicola frontalis*); 329. Streamer-tailed Tyrant (*Gubernetes yetapa*); 330. Shear-tailed Grey Tyrant (*Muscipipra vetula*).



lakes, or marshes. Also slopes with uneven soil (ploughed). Recorded at 3200-5000 m, but usually above 4200 m.

Food and Feeding. Diet consists of insects. Mainly terrestrial, making short runs and hops, then stopping suddenly and standing erect; less frequently, sallies from the ground or a rock. Often forms loose flocks in non-breeding season.

Breeding. Little known. Eggs in Oct in Chile, and juvenile in Jan in Bolivia (Potosí). Nest apparently placed in crevice between rocks. No other information.

Movements. Resident; some altitudinal displacement during harsh weather.

Status and Conservation. Not globally threatened. Locally fairly common to common. Occurs in e.g. Machu Picchu Historical Sanctuary, in Peru, Sajama and Eduardo Avaroa National Parks, in Bolivia, Lauca National Park, in Chile and Los Cardones National Park, in Argentina.

Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chebez (1994), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Hennessey, Herzog & Sagot (2003), Johnson (1967), Koepcke (1970), Marín (2004), Mazar Barnett, Clark *et al.* (1998), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Ridgely & Tudor (1994), Rocha & Quiroga (1996, 1998), Stotz *et al.* (1996), Walker (2001).

320. Cinereous Ground-tyrant

Muscisaxicola cinereus

French: Dormilon cendré **German**: Graubraun-Grundtyrann **Spanish**: Dormilona Cenicienta

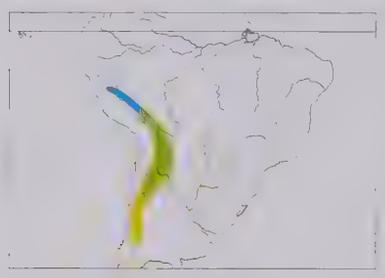
Taxonomy. *Muscisaxicola cinerea* R. A. Philippi [Krumwiede] & Landbeck, 1864, Arañas, Valle Largo, Las Chacarillas, Cordilleras de Santiago, Chile.

Formerly considered conspecific with *M. alpinus* by some authors. Two subspecies currently recognized.

Subspecies and Distribution.

M. c. cinereus R. A. Philippi [Krumwiede] & Landbeck, 1864 - breeds Peru (S Puno), Bolivia, N Chile (Coquimbo S to Talca) and W Argentina (Mendoza); S populations migrate N.

M. c. argentina Hellmayr, 1932 - breeds NW Argentina (Jujuy S to Catamarca); S populations migrate N.



Descriptive notes. 16·5 cm. Relatively plain-headed. Has narrow white supercilium extending to eye, dusky lores; greyish-brown above, wings duskier, some pale edging on wing-coverts; tail blackish, outer feather narrowly edged white; greyish-white below, whiter on belly; iris dark brown; bill and legs black. Distinguished from *M. alpinus* by smaller size, paler and greyer head and upperparts, paler breast hardly contrasting with throat, narrower and shorter supercilium; from *M. griseus* by smaller size, narrow and short white supraloral extending back only to over eye. Sexes alike. Race *argentina* is slightly larger than nominate, otherwise very similar. Voice. Unknown.

Habitat. Montane scrub, open *puna* grassland, rocky pastures near streams and lakes; near bogs and lakesides in austral winter. Mostly 2500-5000 m.

Food and Feeding. Insects. Mainly terrestrial, making short runs and hops, stopping suddenly and standing erect; less frequently, sallies from the ground or a rock.

Breeding. Sept-Mar; nests found in Nov in Chile and Argentina, also eggs in Oct in Chile, and fledglings in Dec in Argentina Jan in S Peru. Nest an open grass cup, lined with feathers and horsehair, placed in crevice between rocks; one in Argentina with internal diameter 6 cm, depth 4 cm. Clutch 2 eggs. No other information.

Movements. Some migration N during austral winter, birds reaching C Peru (Lima and Junín).

Status and Conservation. Not globally threatened. Uncommon to fairly common. Occurs in e.g. Machu Picchu Historical Sanctuary, in Peru, and Sajama and Eduardo Avaroa National Parks, in Bolivia.

Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chesser (1997), Clements & Shany (2001), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Hennessey, Herzog & Sagot (2003), Jaramillo (2003), Johnson (1967), Joseph (1996), Landbeck (1877), Marín (2004), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Quiroga *et al.* (1998), Ridgely & Tudor (1994), Smith & Vuilleumier (1971), Stotz *et al.* (1996), Vuilleumier (1994), Walker (2001).

321. White-fronted Ground-tyrant

Muscisaxicola albifrons

French: Dormilon à front blanc **German**: Weißstirn-Grundtyrann **Spanish**: Dormilona Gigante

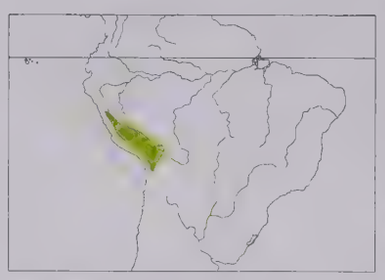
Taxonomy. *Pt[yonura] albifrons* Tschudi, 1844, Junín, Peru.

Monotypic.

Distribution. C & S Peru (S from Lima and Junín), W Bolivia (La Paz) and extreme N Chile (Cordillera de Arica, in Tarapacá).

Descriptive notes. 20-21·5 cm. Largest *Muscisaxicola*, with long wings (primaries extend nearly to tail tip). Has conspicuous white forehead merging on to supercilium, brownish crown, dull brown hindcrown; upperparts smoky grey; secondaries and wing-coverts edged silvery grey; tail blackish, outer 2-3 feathers pale-edged, outer web of outermost wholly pale from below; pale smoky grey below, turning whitish on central belly, vent white, underparts with faint pale streaks; iris dark brown; bill and legs black. Sexes alike. Juvenile undescribed. Distinguished from *M. flavinucha* by slightly larger size, white patch formed by feather edges on wing-coverts and base of remiges (evident in flight and at rest), no yellow occipital patch, greyer belly. Voice. Unknown.

Habitat. High *puna* grassland and barren rocky hillsides with boulders and cliff faces but little or no shrubbery; often forages on bogs dominated by flat-topped cushion-plants and matted grass, also adjacent grassy slopes. At 4000-5600 m.



Food and Feeding. Insects. Usually solitary, even in non-breeding season. Forages mostly on the ground, pursuing prey by running or in short and swift low flights; posture very upright.

Breeding. Eggs in Nov and Jan in Chile. Nest an open cup, placed on slope with sparse low shrubs and bunchgrass. No other information available.

Movements. Resident.

Status and Conservation. Not globally threatened. Generally considered uncommon to fairly common. Occurs in several protected areas, including Machu Picchu Historical Sanctuary, in Peru, and Lauca National Park, in Chile. Restricted to higher elevations; can be found, for instance, at La Cumbre pass, N of La Paz, in Bolivia.

Bibliography. Araya & Chester (1993), Chapman (1921), Chesser (1996), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Hennessey, Herzog & Sagot (2003), Jaramillo (2003), Johnson (1967), Koepcke (1970), Marín (2004), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Stotz *et al.* (1996), Tschudi (1844-1846), Walker (2001).

322. Ochre-naped Ground-tyrant

Muscisaxicola flavinucha

French: Dormilon à nuque jaune **German**: Gelbnacken-Grundtyrann **Spanish**: Dormilona Fraile

Taxonomy. *M[uscisaxicola] flavinucha* Lafresnaye, 1855, Chile.

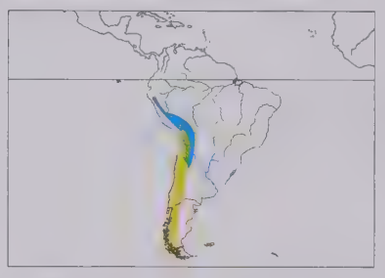
Two subspecies recognized.

Subspecies and Distribution.

M. f. flavinucha Lafresnaye, 1855 - breeds N & C Chile (Antofagasta S to Colchagua) and W Argentina (Mendoza S to Santa Cruz).

M. f. brevirostris Olrog, 1949 - breeds S Chile and S Argentina S to Tierra del Fuego.

Species winters N to N Peru and W Bolivia.



Descriptive notes. 18-5-20 cm. Large and long-winged ground-tyrant. Has white forehead and supercilium, pale ochre crown patch; rest of crown and upperparts pale brownish-grey; wings duskier, narrowly edged white (in fresh plumage remiges broadly tipped white); tail black, outer rectrices edged white; throat and chest greyish-white, becoming white on lower belly and vent; iris dark brown; bill long, black; legs black. Sexes alike. Juvenile has crown patch faint or absent, buff edgings in wing. Race *brevirostris* is darker than nominate, slightly smaller bill and wings. Voice. Short high-pitched bursts, "tsee tee tsee tseet".

Habitat. Stony slopes with little vegetation, near water; *puna* grassland and bogs. Mostly 2000-4500 m, also breeding at 500-1000 m S of N Chile; occasionally down to sea-level in S Chile, especially during inclement weather.

Food and Feeding. Insects. Mainly terrestrial, making short runs and hops, stopping suddenly and standing erect; less frequently, sallies from the ground or a rock; also searches in leaf litter and plants, flicking aside leaves for hidden insects.

Breeding. Oct-Feb; possibly double-brooded. During display, male flies high up with dangling legs, comes to a stall, then drops to ground. Nest an open cup made of grass, lined with feathers, placed in crack or cavity in rock, under stone, in rodent burrow, or directly on ground. Clutch 3 eggs, sometimes 2 or 4. No other information.

Movements. Migratory; spends austral winter (Mar-Sept) farther N, into Andes of W Bolivia and Peru.

Status and Conservation. Not globally threatened. Uncommon to locally fairly common. One of the most abundant ground-tyrants in C Chile. Breeding range possibly slightly more extensive; scattered reports of potential breeders in Boliva (Oruro) and S Peru. Occurs e.g. in all national parks in Patagonian Andes; in non-breeding season also in Eduardo Avaroa National Park, in Bolivia.

Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chebez (1994), Chesser (1997), Clark (1986), Clements & Shany (2001), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2000, 2003), Fjeldså & Krabbe (1990), Flores & Capriles (1998), Humphrey *et al.* (1970), Johnson (1967), Joseph (1996), Marín (2004), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Olrog (1972), de la Peña (1988), Ridgely & Tudor (1994), Rocha & Quiroga (1996, 1998), Stotz *et al.* (1996).

323. Rufous-naped Ground-tyrant

Muscisaxicola rufivertex

French: Dormilon à calotte rousse **Spanish**: Dormilona Nuquirroja
German: Rotnacken-Grundtyrann

Taxonomy. *M[uscisaxicola] rufivertex* d'Orbigny and Lafresnaye, 1837, Cobija, Antofagasta, Chile.

Race *occipitalis* possibly a separate species, may occur together with *pallidiceps* (in non-breeding season) and no intermediates between them are known; further research required. Three subspecies recognized.

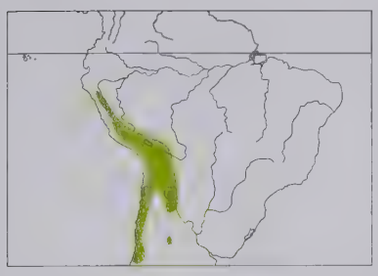
Subspecies and Distribution.

M. r. occipitalis Ridgway, 1887 - Peru (except SW) and NW Bolivia (La Paz, Cochabamba).

M. r. pallidiceps Hellmayr, 1927 - SW Peru (Arequipa S to Tacna), N Chile (Arica S to Antofagasta), SW Bolivia and NW Argentina.

M. r. rufivertex d'Orbigny & Lafresnaye, 1837 - breeds in mountains of Chile (Atacama S to Colchagua) and W Argentina (Sierra de Mendoza and Córdoba).

Descriptive notes. 15·5-18 cm. The palest and purest grey ground-tyrant. Nominate race has faint white supercilium and broken eyering, bright cinnamon or orange-rufous crown patch (sometimes surprisingly inconspicuous and concealed); rest of head and upperparts pale grey, lower rump black; wings dusky grey; tail dusky, outer web of outer feathers edged white; pale grey below, throat and belly whitish; iris dark brown; bill long, thin, slightly downcurved at tip, black; legs



black. Sexes alike. Juvenile has crown patch duller and browner, wing-coverts edged cinnamon. Race *occipitalis* is noticeably larger than nominate, crown patch darker chestnut, broader and more prominent white supercilium, little or no pale edging in tail; *pallidiceps* is smaller, paler ashy grey above, supercilium narrower, crown patch paler, tail blacker. Voice. Call a loud "tweet" and "tit"; male during display utters thin, high-pitched "twee-it".

Habitat. Grassland and grassy or ploughed pastures, often near rocky slopes and ravines, cliffs and edges, sometimes dry desert; may roost in rocky caves. At 2200-4500 m; race *occipitalis* 3000-4500 m; *pallidiceps* 2200-4000 m, in austral winter 300-1000 m.

Food and Feeding. Insects. Mainly terrestrial, making short runs and hops after prey, stopping suddenly and standing very erect; less frequently, sallies from the ground or a rock. Generally solitary; often forms small flocks in non-breeding period.

Breeding. Nests found in Nov-Jan in Argentina; eggs in Sept in C Chile; nestlings in Sept and Dec in S Peru. Displaying male flies to c. 16 m, hangs vertically with wings stretched fully above back, calls, and drops to ground. Nest made of plant material, internal open cup of small straws, lined with feathers and hair, placed in crack between rocks; one nest in Argentina had external diameter 11 cm, internal diameter 6·5 cm, depth 4·5 cm, one in Peru (race *occipitalis*) with external diameter 14 cm, internal diameter 7 cm, depth 5 cm. Clutch 3 eggs; no information on incubation and fledging periods. Parasitized by Shiny Cowbird (*Molothrus bonariensis*).

Movements. Not well known. Race *occipitalis* apparently resident; *pallidiceps* an altitudinal migrant, descending to as low as 300 m in austral winter, may also migrate N (joining *occipitalis*); nominate race may also be an altitudinal migrant. No definitive evidence of long-distance migration.

Status and Conservation. Not globally threatened. Uncommon to locally common. The most abundant ground-tyrant in SW Peru. Occurs in Machu Picchu Historical Sanctuary and Huascarán National Park, both in Peru, and Eduardo Avaroa National Park, in Bolivia.

Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chapman (1921), Chebez (1994), Chesser (1997), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Flores & Capriles (1998), Jaramillo (2003), Johnson (1967), Koepcke (1970), Landbeck (1877), Marín (2004), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Ridgely & Tudor (1994), Stotz *et al.* (1996), Walker (2001), Zimmer (1930, 1937a).

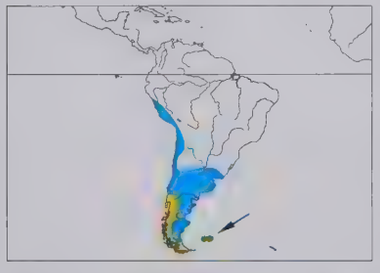
324. Dark-faced Ground-tyrant

Muscisaxicola maclovianus

French: Dormilon bistré **German**: Maskengrundtyrann **Spanish**: Dormilona Carinegra

Taxonomy. *Sylvia macloviana* Garnot, 1829, Falkland Islands.
Two subspecies recognized.

Subspecies and Distribution.
M. m. mentalis d'Orbigny & Lafresnaye, 1837 - S Chile (Llanquihue S to Cape Horn) and S Argentina (Neuquén and Río Negro S to Tierra del Fuego); winters N to N Peru, NE Argentina and Uruguay.
M. m. maclovianus (Garnot, 1829) - Falkand Is.



Descriptive notes. 15-16·5 cm. Generally shorter-billed than other ground-tyrants, accentuated by small and rounded appearance. Has forehead, lores and cheek blackish, crown dull chestnut-brown; upperparts dark brown or smoky brown, wings duskier, lower rump and tail black, outer web of outermost rectrix whitish; grey below, belly and crissum white; iris dark; bill and legs black. Sexes alike. Juvenile has throat streaked, wing-coverts edged buffy. Race *mentalis* is considerably smaller than nominate. Voice. Alarm call a series of loud "cheep" and rapid "tu" or "chee-tú"; territorial song reported as a warbling series of notes; flight call a discreet "zilip".

Habitat. Open meadows near forest and woodland edge and high Andean slopes; also marshy places in valleys and prairie-like habitat in vicinity of rivers; sometimes associated with cushions of *Azorella* at high elevations. In non-breeding season, occurs in grassland, pastures, sandy deserts, beaches, and on and near dry kelp beds and floating seaweed; sometimes in irrigated fields. Below 1200 m, rarely to 2500 m.

Food and Feeding. Insects. Mainly terrestrial, making short runs and hops after prey, stopping suddenly and standing erect; sometimes hovers for long periods with tail spread, seeking prey on the ground; occasionally perches on trees and telephone poles. Usually solitary or in pairs, but often forms loose flocks (of up to 100 individuals) in non-breeding season.

Breeding. Sept-Mar (race *mentalis*); Oct-Dec in Falkland Is (nominate); possibly double-brooded. Displaying male flies up c. 16 m, then drops to ground, where it raises and lowers wings in front of female. Nest an open cup made of grass, sometimes with rootlets, lined with feathers, wool, etc., placed in crack or hollow between rocks; one nest in Falklands (nominate race) a deep cup with diameter 7·5 cm. Clutch 2-3 eggs; no information available on incubation period; fledging period 18 days.

Movements. Resident in Falkland Is. Mainland race *mentalis* migratory, spends austral winter (Apr-Oct) along coasts W to N Chile and Peru (N to La Libertad), and NE to N Argentina (Jujuy, Córdoba, Entre Ríos and Buenos Aires) and Uruguay. Vagrant recorded on South Georgia in Sept 1994.

Status and Conservation. Not globally threatened. Common. Most numerous ground-tyrant in S part of Tierra del Fuego in austral summer. Nominate race in Falkland Is estimated at 4000-8000 pairs in 1983-93; domestic cats a major predator. High-elevation populations presumably at lower risk than are grassland populations, as grasslands are disappearing through overgrazing and agriculture.

Bibliography. Araya & Chester (1993), Arballo (1990), Canevari *et al.* (1991), Cawkell & Hamilton (1961), Chebez & Bertonatti (1994), Clark (1986), Clements & Shany (2001), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2000, 2003), Fjeldså & Krabbe (1990), Harris (1998), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967), Joseph (1996), Landbeck (1877), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nores *et al.* (1983), Olrog (1972), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Shirihai (2002), Stotz *et al.* (1996), Woods (1988), Woods & Woods (1997).

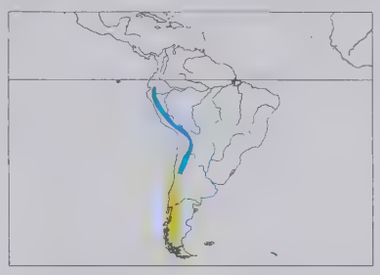
325. White-browed Ground-tyrant

Muscisaxicola albilora

French: Dormilon à sourcils blancs **Spanish**: Dormilona Cejiblanca
German: Rostkappen-Grundtyrann

Taxonomy. *Muscisaxicola albilora* Lafresnaye, 1855, Santiago, Chile.
Has in the past been considered closely related to, and perhaps conspecific with, *M. juninensis*.
Monotypic.

Distribution. Breeds in C & S Chile (Aconcagua S to Magallanes) and CW & SW Argentina and E Río Negro; winters N to W Bolivia, Peru and Ecuador.



Descriptive notes. 16·5-17 cm. Has prominent long, narrow white supercilium, tawny crown merging into rufous on hindcrown; upperparts greyish, wings dusky grey; tail black, outer web of outer pair of feathers whitish; dull pale grey below, vent whitish; iris dark brown; bill long, dusky; legs dusky. Differs from *M. juninensis* in slightly larger size, darker crown, more obvious supercilium. Sexes alike. Juvenile has whole crown brown, tertials and wing-coverts narrowly edged dull rufous. Voice. Song an excited "tstet, tseek, tut, tsk, tchk"; flight call "tseet", contact call "tut"; during aerial display rarely "clet ip".

Habitat. *Puna* grassland, pastures and stony hillsides, occasionally near marshes and lakes; also barren rocky slopes nearly free of vegetation near water; in pastures and other areas with partly wooded terrain during migration. Often associated with marshes or lakes in non-breeding range. At 1500-2500 m; in non-breeding season 2500-4000 m.

Food and Feeding. Insects. Mainly terrestrial, making short runs and hops after prey, stopping suddenly and standing erect; less frequently, sallies from the ground or a rock. Usually solitary; loose flocks during migration.

Breeding. Eggs in Oct-Jan in Chile; nests found in Nov and Feb in Argentina. During aerial display, flies up slowly, with legs dangling and tail spread, before dropping to ground; aggressive behaviour includes one or both wings raised, tail fanned, and crown erect; sometimes bows, sometimes flies with shaking wings. Nest an open cup made of grass, lined with feathers, placed in crack or hollow between rocks. Clutch 2-3 eggs. No other information.

Movements. Migratory; spends austral winter (Apr-Sept) farther N, to Bolivia, Peru and Ecuador, and recently recorded on Gorgona I (off SW Colombia). Accidental in Falkland Is.

Status and Conservation. Not globally threatened. Fairly common. Generally numerous on Chilean nesting grounds, especially around Santiago, where the most numerous breeding ground-tyrant. Occurs in all national parks along S Andes. In non-breeding season fairly common in Bolivia and Peru, uncommon in Ecuador (but regular on various Ecuadorian mountains).

Bibliography. Araya & Chester (1993), Butler (1979), Canevari *et al.* (1991), Cawkell & Hamilton (1961), Chesser (1997), Clements & Shany (2001), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Fjeldså & Krabbe (1990), Jaramillo (2003), Johnson (1967), Joseph (1996), Marín (2004), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nellar (1993), Olrog (1972), Ortiz von Halle (1990), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Walker (2001), Woods (1988).

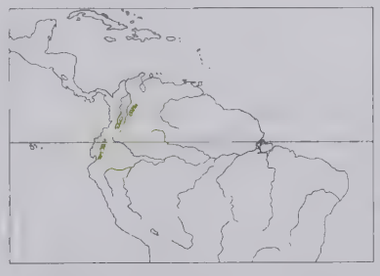
326. Plain-capped Ground-tyrant

Muscisaxicola alpinus

French: Dormilon à grands sourcils **Spanish**: Dormilona Gris
German: Weißbrauen-Grundtyrann
Other common names: Paramo Ground-tyrant

Taxonomy. *Taenioptera alpina* Jardine, 1849, Quito, Ecuador.
Formerly considered conspecific with *M. griseus* and *M. cinereus* by some authors; recent molecular work supports treatment as distinct species. Races weakly differentiated. Three subspecies recognized.

Subspecies and Distribution.
M. a. columbianus Chapman, 1912 – NC Andes of Colombia.
M. a. quesadae Meyer de Schauensee, 1942 - E Andes of Colombia (Boyacá, Cundinamarca).
M. a. alpinus (Jardine, 1849) - Ecuador.



Descriptive notes. 18-19 cm. Has long and broad white supercilium extending beyond eye, small white area below eye; lores dusky; greyish-brown above, crown tinged sepia-brown; wings duskier, some pale edging on wing-coverts; tail blackish, outer rectrix narrowly edged white; greyish-white below, whiter on throat and belly; iris dark brown; bill somewhat short and thin, black; legs black. Differs from *M. cinereus* mainly in larger size, darker and browner upperparts, whitish supercilium extending slightly beyond eye. Sexes alike. Juvenile has wing-coverts and inner remiges narrowly tipped and edged cinnamon, belly and vent tinged buff, whitish streaking below, feathers of crown and back with faint darker tips. Race *columbianus* is nearly inseparable from nominate, but slightly darker on back (closer to crown colour), greyer on belly; *quesadae* may average slightly smaller. Voice. Generally silent; weak plaintive note (Colombia), also occasional soft "tik" note.

Habitat. Arid montane scrub, *puna* and *páramo* grasslands, often where rocky; also, stands of *Espeletia* or areas of low vegetation from tree-line up to snow-line. Mainly 3300-4700 m, occasionally down to 800 m.

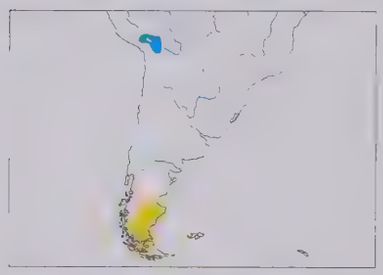
Food and Feeding. Insects. Feeds on ground, making run or hops, often suddenly stopping, and standing erect; sometimes sallies to ground from low perch; often flicks tail. Sometimes takes slightly elevated perch, e.g. on rock or wall. Usually solitary; in non-breeding season regularly in loose flocks of up to 30 individuals, occasionally in association with other ground-tyrants or other *puna*-zone birds.
Breeding. Sept-Dec in Colombia (Boyacá) and Aug in Ecuador. Displaying male repeatedly hovers, stalls and drops. Nest a sparsely lined grass and root mass, placed in hole or crevice under rock. Clutch 4 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Locally fairly common to common. Especially numerous at higher elevations in Cotopaxi National Park, in Ecuador. Rather uncommon in Colombia. Occurs in Puracé National Park, in Colombia, and Las Cajas National Recreation Area, in Ecuador.
Bibliography. Butler (1979), Chapman (1917c), Chesser (2000), Clements & Shany (2001), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Hilty & Brown (1986), Meyer de Schauensee (1982), Parker *et al.* (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Salaman (1994), Stotz *et al.* (1996), Vuilleumier (1994), Williams & Tobias (1994).

327. Cinnamon-bellied Ground-tyrant

Muscisaxicola capistratus

French: Dormilon à ventre roux **German**: Zimtbauch-Grundtyrann **Spanish**: Dormilona Canela

Taxonomy. *Ptyonura capistrata* Burmeister, 1860, foot of Sierra de Mendoza, Argentina.
Monotypic.
Distribution. Breeds extreme S Chile and S Argentina; migrates N as far as S Peru.



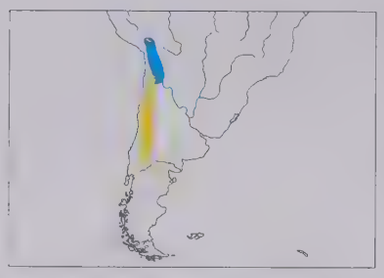
Descriptive notes. 16·5-18 cm. Has black forehead, bright rufous-chestnut mid-crown and hindcrown (pattern usually conspicuous in field); nape and back dusky grey or brownish-grey, wings dusky, feathers edged pale white; tail black, outer rectrices edged white; throat whitish, greyish-buff on chest becoming cinnamon-rufous or rufous-buff on belly, darker on flanks and vent (pattern often not conspicuous in field); iris dark; bill and legs black. Sexes alike. Juvenile is paler on belly and crown, feathers narrowly tipped blackish, breast faintly mottled, wings edged buff. Voice. High-pitched "wee tee, wee tee tee" and "wee tee tee tee", also longer "weetee weetee weeteewee wee wee".
Habitat. Occurs in rolling hills with scattered bushes and sparse grass, often adjacent to rocky outcrops and slopes, rocky canyons with grassy patches, and pastures; prefers flat, short and moist grass. Also cushion bogs and lakeshores in non-breeding season. May roost in caves. Breeds below 500 m; in non-breeding season, however, occurs in elevational range of 2000-4000 m, and rarely up to 4700 m.
Food and Feeding. Insects. Mainly terrestrial, making short runs and hops after prey, stopping suddenly and standing erect; less frequently, sallies from the ground or a rock. Regularly flocks on wintering grounds.
Breeding. Little known. Sept-Mar; eggs in Nov-Dec; nests found in Oct, Nov and Jan in Tierra del Fuego. During aerial display flies up, higher than most congeners, hovers with legs dangling and tail spread, wings make whirring sound before birds drops to ground; in high wind, performs closer to ground level; exposes crown, ruffles chest and flanks, when aggressive. Nest an open cup made of grass, lined with feathers, placed in crack or hollow between rocks, sometimes in abandoned rodent burrow. Clutch 3 eggs. No other information.
Movements. Migratory; spends austral winter (Apr-Oct) mainly in Peru (N to Arequipa), rarely in W Bolivia.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Breeds in Laguna Blanca National Park, in Argentina, and Torres del Paine National Park, in Chile. Earlier observers reported the species as locally common, but in late 1980s reported as rare and local. Population appears either to fluctuate greatly or to have decreased markedly in recent decades.
Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chesser (1997), Clark (1986), Clements & Shany (2001), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967), Joseph (1996), Keith (1970), Marín (2004), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Nellar (1993), Nores *et al.* (1983), Olrog (1972), de la Peña (1988), Ridgely & Tudor (1994), Rocha & Quiroga (1996), Stotz *et al.* (1996), Vuilleumier (1994), Zapata (1967).

328. Black-fronted Ground-tyrant

Muscisaxicola frontalis

French: Dormilon à front noir **Spanish**: Dormilona Frentinegra
German: Schwarzstirn-Grundtyrann

Taxonomy. *Ptyonura frontalis* Burmeister, 1860, foot of Sierra de Mendoza, Argentina.
Monotypic.
Distribution. High cordilleras of Chile (Antofagasta S to Santiago) and C Argentina (W Mendoza S to W Río Negro, with isolated population on Somuncará Plateau); winters N to S Peru and W Bolivia.
Descriptive notes. 18 cm. Striking head pattern. Has forecrown black, blackish-chestnut toward hindcrown, with conspicuous white lores and broken eyering; upperparts ashy grey, wings duskier, tail black, outer web of outermost rectrix whitish; pale greyish-white below; iris dark brown; bill slim, distinctly decurved at tip, black; legs black. Sexes alike. Juvenile has forecrown sooty, wing-coverts edged pale buff. Voice. Unknown.
Habitat. *Puna* grassland and stony hillsides with sparse vegetation, often near water. Mostly 2500-4300 m, rarely down to 1800 m.
Food and Feeding. Diet consists of insects. Mainly terrestrial, making short runs and hops after prey, stopping suddenly and standing erect (though less so than most of its congeners); less frequently, sallies from the ground or a rock. In winter solitary, sometimes roosting in caves with *M. rufivertex*.



Breeding. Oct-Mar; nestlings in Dec in Chile. One nest found, in deep crack between rocks, contained 2 chicks. No other information available.
Movements. Migratory; spends austral winter (Apr-Sept) mainly in W Bolivia and S Peru (Arequipa), although not recorded there in great numbers.
Status and Conservation. Not globally threatened. Rare to uncommon; locally more common, e.g. around Portillo ski resort or at El Yeso Reservoir, in C Chile. In austral winter, apparently uncommon in W Bolivia and rare in S Peru.
Bibliography. Araya & Chester (1993), Canevari *et al.* (1991), Chesser (1997), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fjeldså & Krabbe (1990), Jaramillo (2003), Johnson (1967), Joseph (1996), Marín (2004), Meyer de Schauensee (1982), Narosky & Salvador (1998), Narosky & Yzurieta (1993), de la Peña (1988), Ridgely & Tudor (1994), Rocha & Quiroga (1996, 1998), Stotz *et al.* (1996).

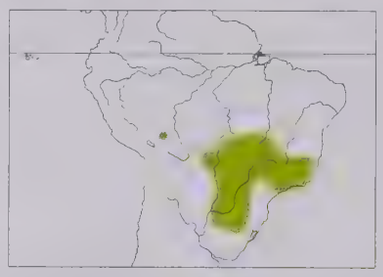
Genus *GUBERNETES* Such, 1825

329. Streamer-tailed Tyrant

Gubernetes yetapa

French: Moucherolle yétapa **German**: Kehlband-Schleppentyrann **Spanish**: Yetapá Grande

Taxonomy. *Muscicapa yetapa* Vieillot, 1818, Río Plata, Paraguay.
Anatomical considerations indicate that closest relatives may be somewhat similar *Muscipipra* and very different *Neoxolmis*. Monotypic.
Distribution. NW Bolivia (upper R Beni) and SC Brazil (S Mato Grosso, extreme S Bahia S to W Rio Grande do Sul) S to E Paraguay and NE Argentina (Chaco, Corrientes, Misiones).



Descriptive notes. 35-38 cm; 42 cm (including tail). Male has pale grey forecrown and supercilium; above, mostly pale grey with dark brown shaft streaks; wings blackish, patch of cinnamon-rufous at base of primaries (conspicuous stripe in flight), tertials edged light brown or sandy-brown; tail long, graduated and very deeply forked, blackish; throat white, sharply outlined on side of neck and across upper chest by dark chestnut pectoral collar; breast and sides pale grey with faint dark shaft streaks, becoming white on belly; iris dark; bill stout, black; legs black. Female is smaller, shorter-tailed and slightly duller. Juvenile considerably duller, with upperparts blotched brown; much shorter tail. Voice. Call a harsh "wurreep", repeated multiple times when hovering over foraging area; also fuller descending phrase of 2 or 3 notes, "jew-jew-jew"; also has a dawn song. During vigorous duetting diplay, one individual (possibly female) begins by uttering clearly whistled "tewear-TEE-tear" 2-4 times in rapid succession while other (perhaps male) utters a warbled "tea-whittle, tea-whittle..." in syncopation, one or both birds also occasionally making pop sound with bill.
Habitat. Buriti palm groves, damp grasslands and marshy terrain near streams, always with some shrubbery nearby. Mostly below 1100 m.
Food and Feeding. Diet consists of insects. Usually in pairs, less often small family groups, perching conspicuously atop bushes and low trees, often at edges of gallery woodland. Sallies out, often long distances, after insects, long tail whipping behind in flight; often hunts low over marshy areas, occasionally pouncing to ground or sallying downward against vegetation to take large insects.
Breeding. Pairs displaying in Jul, Brazil. During duetting display, members of pair perch 10-50 cm apart, facing one another or away; each alternately lowers head while raising and fanning tail above horizontal, then raises head, lowers tail, and excitedly raises both wings high overhead, while calling and bill-popping excitedly in syncopation. Nest not well described, apparently an open cup.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Relatively common at Beni Biosphere Reserve, in Bolivia, and also occurs in San Rafael, San Luis and Ybycuí National Parks, all in Paraguay, and Patrimônio Natural do Caraça Special Reserve and Brasília and Serra da Canastra National Parks, in Brazil.
Bibliography. Andors & Vuilleumier (1998), Canevari *et al.* (1991), Carriker (1935), Cory & Hellmayr (1927), Dubs (1992), Fitzpatrick (1980c, 1981, 1985a), Hayes (1995), Hennessey, Herzog & Sagot (2003), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Parker *et al.* (1991), de la Peña (1988), Ridgely & Tudor (1994), Saibene *et al.* (1996), Schubart *et al.* (1965), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Wetmore (1926).

Genus *MUSCIPIPRA* Lesson, 1831

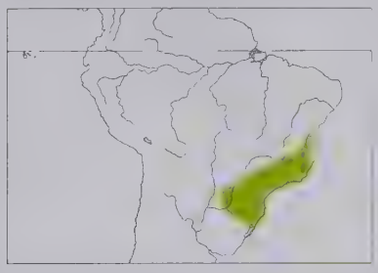
330. Shear-tailed Grey Tyrant

Muscipipra vetula

French: Moucherolle à queue-de-pie **German**: Kerbschwanztyrann **Spanish**: Viudita Coluda

Taxonomy. *M[uscicapa] vetula* M. H. K. Lichtenstein, 1823, São Paulo, Brazil.
Relationships uncertain, but closest allies seem to be *Gubernetes* and *Neoxolmis*, on basis of anatomical studies. Monotypic.

Distribution. CE & SE Brazil (S Bahia, C Minas Gerais and Espírito Santo S to Rio Grande do Sul), E Paraguay and NE Argentina (Misiones, Corrientes).



Descriptive notes. 22-5 cm. Plumage is mostly rather dull dark grey; dusky auriculars forming a weak mask, faint streaking on crown and back; wings and tail dusky blackish; long, slender tail is deeply notched, underside of outer rectrices edged pale whitish; white chin and throat, pale grey belly; iris blackish; bill and legs dusky. Sexes alike. Juvenile has crown, back and wing feathers scaled white. Voice. Usually silent; occasionally utters a "pup-pup-pup" or a disyllabic whistle, "jew-bewt".

Habitat. Inhabits borders of humid and montane forest and secondary woodland; to a lesser extent, moves out into adjacent clearings or natural grassland. Mostly found below 2200 m, and mainly at 1000-2200 m.

Food and Feeding. Insects. Usually in pairs, less often in groups of up to 5-6 birds. Usually hunts near canopy, perching on high exposed branches; less often perches lower, sometimes even dropping to the ground. Sallies after passing prey with graceful undulating flight, often for long distances.

Breeding. Nov in Rio Grande do Sul. Nest is a tall, open cup made of coarse grass and twigs, covered with dry moss and lined with fine grass, less than 1 m above ground in 2-m tall, shrubby *Baccharis*-dominated vegetation amidst *Araucaria* forest. Clutch 3 eggs.

Movements. Resident, but little known.

Status and Conservation. Not globally threatened. Rare to uncommon. Regular in Intervales State Park and common at forest borders and in canopy in Patrimônio Natural do Caraça Special Reserve, both in Brazil. Also occurs in Mbaracayú Forest Nature Reserve, in Paraguay, and Augusto Ruschi Biological Reserve, Mata dos Godoy State Park (Paraná) and Caparaó and Itatiaia National Parks, all in Brazil.

Bibliography. Canevari *et al.* (1991), Chebez (1994), Collar *et al.* (1994), Cory & Hellmayr (1927), Cracraft (1985), Darrieu (1987), Ferreira de Vasconcelos & Melo-Júnior (2001), Fitzpatrick (1985a), Fontana *et al.* (2000), Hayes (1995), Isler (2000), Lanyon (1986a), Lowen *et al.* (1996), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Navas & Bó (1988), Ridgely & Tudor (1994), do Rosário (1996), Saibene *et al.* (1996), Schmidtuz *et al.* (2001), Sick (1993, 1997), Stotz *et al.* (1996), Tobias *et al.* (1993).



PLATE 40

inches 3
cm 8

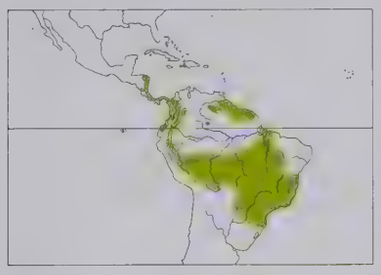
Genus *COLONIA* J. E. Gray, 1827

331. **Long-tailed Tyrant**

Colonia colonus

French: Moucherolle à longs brins **Spanish**: Mosquero Colilargo
German: Weißkappen-Schleppentyrann

Taxonomy. *Muscicapa colonus* Vieillot, 1818, Paraguay. Affinities uncertain; probably belongs in subfamily Fluvicolinae, but further study required. Five subspecies recognized.
Subspecies and Distribution.
C. c. leuconota (Lafresnaye, 1842) - SE Honduras and E Nicaragua S to W Colombia and W Ecuador.
C. c. fuscicapillus (P. L. Sclater, 1861) - E Andes of Colombia, N Ecuador and extreme NE Peru (mouth of R Curaray).
C. c. poecilonota (Cabanis, 1848) - SE Venezuela (S of R Orinoco and in Amazonas) and the Guianas.
C. c. niveiceps J. T. Zimmer, 1930 - SE Ecuador, Peru (San Martín S to N Puno) and N Bolivia (S to Cochabamba).
C. c. colonus (Vieillot, 1818) - C & E Brazil (from Marajó I and S Maranhão S to S Mato Grosso do Sul and N Rio Grande do Sul), E Paraguay and NE Argentina (Misiones).



Descriptive notes. Male 23-28 cm, female 18-22 cm; 15-18 g. Male nominate race dull black, with white forehead and forecrown; whitish rump; belly greyish-black; central tail feathers elongated (up to 13 cm beyond rest), widening slightly towards tip (before moult, one or both feathers often worn or broken); iris dark; bill short and wide, black; legs black. Female similar, but paler and greyer, belly mottled white, back stripe greyer, crown darker, shorter tail streamers. Juvenile paler, sooty grey with pale grey belly, faint whitish stripe bordering crown, central rectrices broader and barely projecting. Races vary in intensity and extent of white on head, amount of white on back, and body and bill size: *leuconota* similar to *poecilonota* but has bill less heavy and crown darker, more sooty grey; *fuscicapillus* has darker back, clear white rump, female with darker crown; *poecilonota* is larger overall, with heavier bill, also blacker, with crown-feathers ashy grey with black central streaks, and irregular white stripe down mid-back; *niveiceps* has pale silvery grey crown. Voice. Soft, rising "tuweee" or "wheeet" while flicking tail up, sometimes calls 2-3 times in quick succession; male song a longer "twee-la, twee-la, twee-la"; musical, humming "druu", accompanied by whipping of long tail; sharp, sibilant "chip" in interactions. During courtship chases "prrri, bi-bibi".
Habitat. Borders of tropical and upper tropical humid forest and secondary woodland, edges of gallery forest, *Cecropia* zone in early-successional forest, recent clearings, active and abandoned plantations with scattered dead snags, forested borders along waterways, treefall gaps inside forest, and snags in upper canopy over primary forest. Usually below 1200 m, rarely to 1800 m.
Food and Feeding. Of 37 prey items in SE Peru, 60% were hymenopterans, 31% coleopterans; in Costa Rica, 67% of prey items were sweatbees (*Trigona*). Specializes on stingless bees (sweatbees) in many areas. Perches conspicuously for minutes on end, high on exposed dead snags or open branches, usually in pairs or family groups; flicks tail-streamers up and down while calling. Makes aerial sallies of 1-10 m to hawk insects, usually returning to same or nearby perch.
Breeding. Birds in breeding condition and nests located Mar-Jul in Central America, Colombia and Venezuela; in Argentina, pair feeding fledgling in Oct and pair seen to enter old woodpecker (Picidae) hole in Nov. Pair maintains small permanent territory around favourite snag or trunk that serves for nesting and foraging; rarely venture far away. Partners chase each other during courtship. Nest a thick mat of compound-leaf rachises, placed inside tree cavity such as old woodpecker hole or rotten knothole 8-30 m up in dead snag or burned trunk in exposed area; defended against other hole-nesting species; female roosts in cavity up to one week before laying. Clutch 2-3 eggs. No other information.
Movements. Mostly resident; apparently leaves extreme S of range for austral winter.
Status and Conservation. Not globally threatened. Fairly common to common. Somewhat local, requiring suitable dead stump with cavity, and nearby colonies of bees. Tolerant of converted habitats, and occurs in many national parks and other protected areas throughout its large range.
Bibliography. Anon. (1998a), Begazo (1995), Brooks *et al.* (1993), Canevari *et al.* (1991), Clements & Shany (2001), Cory & Hellmayr (1927), Fitzpatrick (1980c, 1985b), Fjeldså & Krabbe (1990), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Henderson (2002), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995a), Lanyon (1986a), Lowen *et al.* (1996), Monroe (1968), Narosky & Salvador (1998), de la Peña (1988), Pizo (1996), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robinson (1997), do Rosário (1996), Salaman (1994), Schönwetter & Meise (1968), Sick (1993, 1997), Skutch (1960, 1972), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977), Traylor & Fitzpatrick (1982), Wetmore (1972), Williams & Tobias (1994), Zimmer (1930, 1937a).

Genus *MUSCIGRALLA*

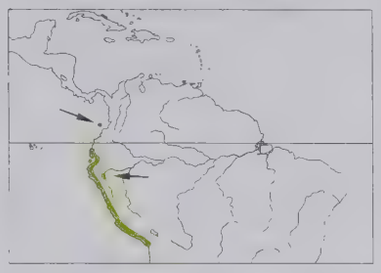
d'Orbigny & Lafresnaye, 1837

332. **Short-tailed Field-tyrant**

Muscigralla brevicauda

French: Moucherolle à queue courte **Spanish**: Dormilona Colicorta
German: Stummelschwanztyrann

Taxonomy. *M[uscigralla] brevicauda* d'Orbigny and Lafresnaye, 1837, Tacna, Peru.
Placed by early authors in Cotingidae or Formicariidae, on basis of tarsal scutes. Affinities within present family unclear; placed in or near *Muscisaxicola* by some, but coronal patch, long legs with aberrant scutellation, bare tibia, wing and tail shapes support current monotypic genus. Monotypic.
Distribution. SW Ecuador (Manabí S to Loja), N & W Peru (Amazonas, and down coast to Tacna) and N Chile (Arica); one specimen from SW Colombia (Gorgona I).



Descriptive notes. 11-11·5 cm. Plumage is brownish-grey above, short supraloral stripe white, semi-concealed yellow coronal patch; upper rump buffy, lower rump and uppertail-coverts rufous-chestnut; wings dusky, wing-coverts tipped whitish (two pale wingbars), remiges narrowly edged whitish; tail extremely short, dusky with narrow buff tips; throat, breast and belly whitish, grading to buffy on flanks; iris dark brown; bill dark brown to blackish; legs very long, flesh-coloured, bare even above "heel". Sexes alike. Voice. Song, usually from mound or low perch, occasionally during aerial display, a weak, sibilant "tizztizzz", sometimes preceded by a few "tik" notes.
Habitat. Arid coastal lowlands and arid intermontane valleys, preferring open, barren or sandy areas and dusty agricultural fields, ploughed areas with sparse weeds, and open ground with scattered bushes or low trees; most common near sea-level, but found at up to 1500 m.
Food and Feeding. Insects. Almost exclusively terrestrial; pursues insects on the ground by alternately running and pausing briefly, making short, rapid sallies or hops to snatch stationary or low-flying prey. Stance upright, appears nearly tailless.
Breeding. Feb-Jun in Ecuador. Song occasionally given during aerial display up to 20 m high. Nest cup-shaped, composed of uniform, dry, greyish grasses (blending with substrate), lined with finer grasses, placed on ground alongside gulley or on open flat ground, usually with some protection from above such as dead tree bough, brush pile, tufts of taller grass, or low stunted arrayan; sometimes constructs partial dome, with at least a third of cup open, in less protected situations. Clutch 3-5 eggs; incubation and nestling periods each c. 13-14 days. Success rate of c. 38-40% has been estimated.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Largest numbers along coast, especially numerous on Santa Elena Peninsula (Ecuador) and arid coastal zone of S Peru. Status in Chile unclear; possibly irregular breeder, dependent on suitability of conditions. Occurs in e.g. Cerro Blanco Forest Reserve, in Ecuador.
Bibliography. Ames (1971), Araya & Chester (1993), Best *et al.* (1993), Butler (1979), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Fitzpatrick (1980c, 1985b), Jaramillo (2003), Johnson (1967), Koepcke (1970), Lanyon (1986a), Marchant (1960), Marín (2004), Meyer de Schauensee (1982), Ortiz von Halle (1990), Peredo & Miranda (2001), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), Smith & Vuilleumier (1971), Stotz *et al.* (1996), Traylor (1977), Traylor & Fitzpatrick (1982), Warter (1965), Zimmer (1930).

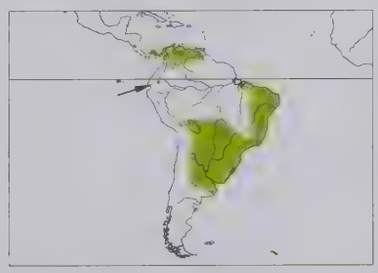
Genus *MACHETORNIS* G. R. Gray, 1841

333. **Cattle Tyrant**

Machetornis rixosa

French: Moucherolle querelleur **German**: Graslandtyrann **Spanish**: Picabuey

Taxonomy. *Tyrannus rixosus* Vieillot, 1819, Paraguay.
Affinities uncertain; molecular and anatomical evidence suggests that superficial resemblance to *Tyrannus* is due to convergence. Race *obscurodorsalis* possibly better merged with *flavigularis*; overlaps with latter in Venezuela and does not appear to be evolutionarily distinct; closer examination necessary. Also, some specimens of nominate from NE Brazil (Piauí) closely approach *flavigularis*. Three subspecies currently recognized.
Subspecies and Distribution.
M. r. flavigularis Todd, 1912 - E Panama, N & E Colombia (N Chocó and upper R Sinú E to Guajira, S to S Bolívar) and N Venezuela (E to Guárico, W Anzoátegui and Delta Amacuro, S to N Bolívar).
M. r. obscurodorsalis Phelps, Sr & Phelps, Jr, 1948 - SW Venezuela (Barinas, W Apure and S Cojedes), E Colombia E of Andes (Norte de Santander S to S Meta and Vichada) and E Ecuador.
M. r. rixosa (Vieillot, 1819) - E & S Brazil (extreme NE Pará E to Rio Grande do Norte, and S to Rio Grande do Sul, also S from S Mato Grosso and Goiás), N & E Bolivia (Beni and Santa Cruz S to Tarija), Paraguay, most of N Argentina (S to San Luis, Córdoba and SW Buenos Aires) and Uruguay.



Descriptive notes. 19·5 cm. Nominate race is primarily pale olive-brown or sandy brown to caramel-brown above; head mostly pale brownish, more greyish on crown, bright scarlet-orange coronal patch (usually concealed), thin dusky eyestripe, slight dusky brownish or yellowish tinge in auricular area; wings olive-brown; tail yellowish-cinnamon or olive-brown, pale dingy tips (broader and more contrasting from ventral perspective); throat whitish; underparts, including underwing-coverts, mostly bright yellow, breast tinged ochraceous olive; iris dark red; bill thin, black, very short or no obvious rictal bristles; legs dark. Differs from superficially similar *Tyrannus* species in shorter, more rounded wings and, especially, long legs. Sexes similar; female may have buff wash on throat and chest, and stated by some authors to lack coronal

On following pages: 334. Piratic Flycatcher (*Legatus leucophaius*); 335. Rusty-margined Flycatcher (*Myiozetetes cayanensis*); 336. Social Flycatcher (*Myiozetetes similis*); 337. Grey-capped Flycatcher (*Myiozetetes granadensis*); 338. Dusky-chested Flycatcher (*Myiozetetes luteiventris*); 339. White-bearded Flycatcher (*Phelpsia inornata*); 340. Great Kiskadee (*Pitangus sulphuratus*); 341. Lesser Kiskadee (*Philohydor lictor*).

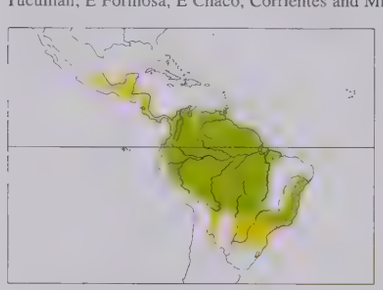
patch. Juvenile undescribed. Race *flavigularis* has throat more buffy yellow, perhaps less grey in crown than nominate, possibly also deeper yellow belly; *obscurodorsalis* is very like previous. Voice. Common call a brief series of thin, squeaky notes that rises in pitch, dawn song a short, repeated trilled whistle, "t'te'te'ree", "tip-tip, tsi-tsip-tsilíp-tsilíp tsirrrr" or "swee see dee", both much like typical vocalizations of *Tyrannus melancholicus* but said to be more strident. At dusk may also give more complicated and sustained series of squeaky "tic" notes and short trills that rise and fall in pitch.
Habitat. Drier semi-open to open habitats, including savanna, pastureland with scattered bushes and trees, agricultural areas, yards around houses, parks in urban areas, and occasionally sandy beaches; generally not found in woodland or forested areas. Primarily tropical lowland areas below 300 m, occasionally ranging to c. 1000 m; single vagrant observed at 3600 m in Venezuela (Mérida).
Food and Feeding. Insects. Usually forages in pairs or small groups. Semi-terrestrial; runs rapidly on ground, with upright posture, sometimes for considerable distances, in pursuit of insects disturbed by domestic animals, much like a *Muscisaxicola* ground-tyrant. Often remains on the ground or perched on back of cattle, horse or capybara (*Hydrochaeris hydrochaeris*) for extended periods, occasionally making quick sallies to the ground or air after flushed insect prey; occasionally hawks from elevated perch. Perches on lower branches of trees, on top of low bushes or on houses.
Breeding. Nest-building observed in Mar (Meta) and juveniles in Jul (lower R Sinú) in Colombia; season Jun-Oct (Guárico) and males in breeding condition in May (Bolívar and César Val) in Venezuela; nests in Oct-Jan in Argentina. Large, multi-chambered stick nest of Plain-fronted Thornbird (*Phacellodomus rufifrons*) appropriated, or builds own bulky ball-shaped grass nest well above ground; one nest in Argentina had external diameter 12 cm, height 7·5 cm, internal diameter 7 cm, depth 5 cm; shows some degree of aggression towards nesting associates and other species that approach nest. Clutch 3-4 eggs; in Argentina, incubation period 14·5 days, fledging 16 days. Parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Mostly resident; some dispersal or local movements occur. Populations of nominate race in S part of range migratory; reports of vagrants in Ecuador and as far N as Panama (Darién).
Status and Conservation. Not globally threatened. Fairly common to common. Tolerant of converted habitat, and occurs in many national parks and other protected areas throughout its large range.
Bibliography. Ames (1971), Anon. (1998a), Babarskas *et al.* (2003), Boano (1981), Camperi (1953), Carriker (1954, 1955, 1959), Canevari *et al.* (1991), Cory & Hellmayr (1927), Cruz & Andrews (1989), Di Giacomo (2004), Fitzpatrick (1980c, 1985a), Fjeldså & Maijer (1996), Friedmann (1927), Haffer (1975), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Klimaitis & Moschione (1987), Lanyon (1984a, 1986a), Lindell (1996), Lowen *et al.* (1996), Macdonald (1981), Mason (1985), Mobley (2002), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Naumburg (1930), de la Peña (1987, 1988, 1996), Phelps & Phelps (1948), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sibley & Ahlquist (1985c), Sick (1993, 1997), Stotz *et al.* (1996), Thomas (1979a), Traylor (1977), Traylor & Fitzpatrick (1982), Walker (1996), Warter (1965), Wetmore (1926).

Subfamily TYRANNINAE
Tribe TYRANNINI
Genus *LEGATUS* P. L. Sclater, 1859

334. **Piratic Flycatcher**
Legatus leucophaius

French: Tyran pirate **German**: Kurzschnabel-Maskentyrann **Spanish**: Mosquero Pirata

Taxonomy. *Platyrhynchos leucophaius* Vieillot, 1818, Cayenne.
Affinities uncertain. Possibly sister to *Myiozetetes*, on basis of syringeal morphology and fully enclosed globular nest. Molecular data give limited support that it is basal to clade including *Phelpsia* and *Philohydor*, while additional analyses indicate some affinity to *Pitangus* and *Myiozetetes*; link to *Myiozetetes* also suggested by piratical nesting behaviour, although observations suggest such behaviour and/or nest adoption either has evolved several times independently or is ancestral trait in the subfamily. Race *variegatus* indistinguishable from nominate on coloration alone; races probably meet in Honduras, though limits not well defined. Birds from S Brazil, Paraguay and Argentina described as race *albicollis*, but merely average somewhat larger. Additional molecular data and closer systematic examination needed to establish relationships, and to determine validity of races. Two subspecies currently recognized.
Subspecies and Distribution.
L. l. variegatus (P. L. Sclater, 1857) - E Mexico (S San Luis Potosí E to Tabasco, N & C Campeche and Quintana Roo to N Oaxaca and N Chiapas) to N & C Guatemala, Belize and Honduras.
L. l. leucophaius (Vieillot, 1818) - Nicaragua S to Panama and Colombia, then E to Venezuela and the Guianas, Trinidad and Tobago, and S through Ecuador, Peru, NW & C Brazil (S to Mato Grosso and N Rio Grande do Sul) and N & E Bolivia to C & E Paraguay and N Argentina (Salta, Jujuy and Tucumán; E Formosa, E Chaco, Corrientes and Misiones).



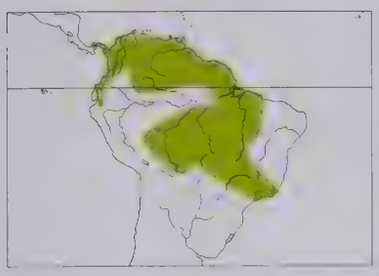
Descriptive notes. 14·5-17 cm; 23-26 g. Has forehead and crown blackish, semi-concealed yellow coronal patch; prominent and fairly broad supercilia, confluent on forehead and encircling crown, dull whitish (sometimes with faint yellow tinge), faintly streaked greyish posteriorly; lores and auriculars dusky brownish, dusky moustachial stripe, white malar region with some greyish flecking, narrow pale submalar streak; upperparts deep greyish-brown or dark olive-brown, most feathers with fairly distinct pale margins, uppertail-coverts usually with fairly prominent rusty, cinnamon or fulvous edging; wings brownish-black, median wing-coverts with fairly distinct whitish terminal margins, greater coverts and secondaries also with whitish edging (much broader on tertials, almost absent towards base of outer secondaries), primaries with very narrow pale greyish-brown edging; tail dusky brown or blackish-brown; outer webs of rectrices often with narrow light olive or rufous edging (nearly white or yellowish-white on outermost rectrices), inner webs with pale greyish-brown, rusty or fulvous edging; chin and throat pure whitish; underparts largely yellowish-white or very dull pale yellow, breast, sides and flanks with broad, somewhat diffuse brownish or olive streaking, undertail-coverts with some faint dusky streaking; iris brown; bill short, stubby, rather broad, brownish-black, browner base of lower mandible, rictal bristles very short; legs dusky. Sexes alike, female on average slightly smaller than male. Juvenile is essentially like adult, but lacking any yellow on crown, crown feathers lightly tipped cinnamon, supercilium pale buff or buffy white, broad cinnamon terminal margins on median and greater wing-coverts, rusty edging on rectrices, paler underparts nearly or completely unstreaked. Race *variegatus* is significantly larger than nominate. Voice. Rather conspicuous vocally during breeding period; male song, often repeated tirelessly from exposed perch in canopy, a bright, clear, yet petulant and whiny "wheé-yéé" or slurred "swee-u" whistle, often followed by pause of 1-2 seconds and then short, tremulous, rising "pír-ri-ri-ri-ree"; also "de-di-di-di-di", rolled "ji-ji-jit" or persistent "whee di-weet"; also longer, sometimes prolonged series of emphatic, piping, rising and falling "whii-whii-whii" or "pee-pee-pee" whistles; calling can continue for long periods, often persists through hottest part of day; alarm a rapidly repeated sharp, low "dee"; also said to emit rarely a frog-like call consisting of c. 15 "reek" notes in 3 seconds, context uncertain.
Habitat. Tall second growth and gallery forest, lighter humid woodland and evergreen forest borders, edges of secondary woodland, agricultural areas, and forest clearings that retain at least some scattered tall trees, also hedges. Mostly below 1000 m, but observed as high as 1500 m and rarely as high as 1850 m in Central America, and at 1700 m in W Colombia.
Food and Feeding. Insects, e.g. dragonflies (Odonata); also fruit. Adults said to be almost entirely frugivorous, with copious small berries and green catkins of *Cecropia*, when fruits abundant. Alone or in pairs; often perches conspicuously at upper to middle levels on exposed branch, often atop bare snags; prefers to remain at higher levels in canopy. Takes flying insects by aerial hawking.
Breeding. Breeding times require further documentation: in Venezuela, birds in breeding condition by Feb (Barinas), Mar-Apr (S & E Bolívar and Huila) and Mar-Aug (Guárico); occupied nests found in Feb-Aug in Trinidad and Oct-Dec in Argentina; Aug-Dec in SE Peru. No nest built; instead, usurps fully completed domed or pendent nest of various other species as much as ten times its own weight, especially icterids, *Phacellodomus* thornbirds, and *Pachyramphus* and several other tyrannids (including *Tolmomyias*, *Rhynchocyclus*, *Pitangus*, *Myiozetetes*); nest appropriation achieved by incessant harassment through aggressive diving attacks, egg-tossing, and sometimes nestling removal, to the point of complete abandonment by rightful owners; tends to adopt previously abandoned globular nests of more defensive nest-builders *Pitangus* and *Myiozetetes*; often adds dead leaves to interior of stolen or adopted nest. Clutch 2-3 eggs, sometimes 4; incubation by female alone, period 16 days; chicks brooded by female, fed by both parents, fledging period 18-20 days. Some migrant populations may breed both in Cetral America and in Amazonia.
Movements. At least partially migratory in both N & S parts of range. Although details not well known, it appears that Central American breeders move to N South America and Amazonia from about late Sept to early Jan; influx of migrants most numerous in Rancho Grande area of Venezuela from Mar to Jun, and perhaps later. Breeding population arrives S Costa Rica in late Jan to early Feb and up to 2-4 weeks later in areas farther N, departing by late Sept to early Oct. Apparently leaves Panama from late Sept to Dec as fruit becomes increasingly scarce during peak of rainy season; returns first to Pacific side of Canal Zone (where fruits tend to ripen earlier) by late Jan, but not until Feb-Mar on more rainy Caribbean side (fruits ripen later). Present in SE Peru from mid-Aug to Feb-Mar; in Argentina and S Brazil roughly Sept-Mar. Seasonal abundance and movements require closer study throughout species' range.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Has large range covering most of Middle America and most of N & C South America. Occurs in many national parks and other protected areas throughout range.
Bibliography. Ames (1971), Anon. (1998a), Binford (1989), Birdsley (2002), Canevari *et al.* (1991), Carriker (1910), Chesser (1997), Clements & Shany (2001), Cory & Hellmayr (1927), ffrench (1991), Fitzpatrick (1985a), Fjeldså & Maijer (1996), Haverschmidt (1968, 1973), Haverschmidt & Mees (1994), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Ihering (1900), Joseph (1996), Lanyon (1984a), Lee Jones (2004), Lowen *et al.* (1996), Mobley (2002), Moermond & Denslow (1985), Monroe (1968), Morton (1977), Narosky & Salvador (1998), Oren & Parker (1997), de la Peña (1987, 1988), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson (1985, 1997), Robinson & Terborgh (1997), do Rosário (1996), Salaman (1994), Short (1975), Sick (1993, 1997), Skutch (1960, 1972, 1985), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Terborgh *et al.* (1984), Thomas (1979b), Traylor (1977), Traylor & Fitzpatrick (1982), Tostain *et al.* (1992), Walther (2004), Warter (1965), Wetmore (1972), Willis (1980), Zimmer (1930).

Genus *MYIOZETETES* P. L. Sclater, 1859

335. **Rusty-margined Flycatcher**
Myiozetetes cayanensis

French: Tyran de Cayenne **Spanish**: Bienteveo Alicastaño
German: Rostschwingen-Maskentyrann

Taxonomy. [*Muscicapa*] *cayanensis* Linnaeus, 1766, Cayenne.
Morphological and behavioural evidence suggests genus most closely related to *Legatus*; nesting behaviour links with *Pitangus*. Molecular data indicate strong support for a clade consisting of present species and *M. similis* as sister-group to one formed by *M. granadensis* and *M. luteiventris*. South American races require closer scrutinty; birds from E Panama described as additional race, *harterti*, on basis of smaller size, but subsequently considered inseparable from *hellmayri*. Four subspecies currently recognized.
Subspecies and Distribution.
M. c. hellmayri Hartert & Goodson, 1917 - E Panama (E from Canal Zone), tropical N & W Colombia (W of E Andes), W Venezuela (Maracaibo Basin, and W slope of Andes from W Lara S to Táchira) and W Ecuador (S to El Oro and W Loja).
M. c. rufipennis Lawrence, 1869 - N Venezuela (N of R Orinoco), E Colombia E of E Andes (Norte de Santander S to W Caquetá and Vaupés) and E Ecuador.
M. c. cayanensis (Linnaeus, 1766) - S Venezuela (Amazonas, Bolívar, Delta Amacuro), the Guianas, N & C Brazil (R Negro E to Maranhão and Piauí, S to E Acre, Rondônia, Mato Grosso, Goiás and W Minas Gerais), SE Peru (Madre de Dios) and N Boliva (S to Cochabamba and N Santa Cruz).
M. c. erythropterus (Lafresnaye, 1853) - SE Brazil (S & E Minas Gerais, Rio de Janeiro).
Descriptive notes. 16·5-18 cm; 26 g. Nominate race has head mostly dark sooty or blackish-brown, large bright yellow to golden-orange coronal patch (mostly concealed), broad white supercilia confluent on forehead and nearly so on nape; upperparts plain brown to olive-brown; wings deep greyish-brown, dull olive margins on inner secondaries, narrow rusty or cinnamon-rufous edges of distal



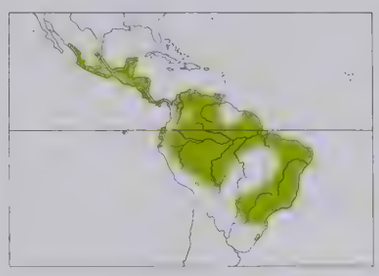
secondaries and proximal primaries, primaries with narrow paler rufous margins; tail dusky brownish with light olive edging; chin and throat white; underparts, including axillaries and underwing-coverts, bright yellow; iris brown; bill stubby, black; legs black. Differs from similar *M. similis* in having less dusky head, less olivaceous back. Sexes alike, female on average slightly smaller than male. Juvenile resembles adult, but lacks crown patch and has broader, more rusty-cinnamon margins on wing and tail feathers. Race *hellmayri* is very similar to nominate, but lighter and more olivaceous above, with less pronounced rufous margins on primaries; *rufipennis* has broader and more conspicuous rufous on wings (basal half of primaries on both webs) and tail, but birds in Orinoco Valley more like nominate; *erythropterus* is larger than nominate, also has more prominent rufous in wing. VOICE. Most common call a thin, whining, almost plaintive "peeeeeeeea" or "wheeeeee" 2-3 seconds long, sometimes repeated several times; various other vocalizations when excited, e.g. loud and emphatic "puuuureeeéét-éét-éét" or "too-eeéet", and quick rolling series of "keé-wit" "tis-u" or "chew-chewit" repeated numerous times and sometimes given in duet. Dawn song a repeated "fwee", sometimes with short couplet or additional note added.
Habitat. Shrubby areas and clearings, semi-open areas, cultivation, other disturbed habitat retaining some trees, also forest borders and gallery forest; also along oxbow lakes and river edges in Amazonia. More often near water and less common around habitations than *M. similis*, but where latter absent frequents more residential areas such as ranches, parks and gardens (usually staying farther from habitations compared with that species); in some areas the two species seem to replace each other. Mostly below 1000 m; sometimes to 1900 m and recorded rarely as high as 2100 m.
Food and Feeding. Insects, also fruits. Usually in pairs or small sociable groups; generally more retiring and less vocal than *M. similis*. Perches in the open at varying heights, sallying to the ground or foliage, or hawking insects from the air; often sallies over water. Takes small berries by hover-gleaning and quick hover-snatching.
Breeding. Breeding recorded in Mar-Aug in Venezuela (Hato Masaguaral, in Guárico); laying in Mar-Apr in Panama; in Colombia, juvenile and laying female in Jan in N Huila, nest-building observed Mar, Aug and Nov and fledglings by early Jun in Anchicayá Valley, nest-building early Jun in Valle, and nestlings in May in W Meta. Sometimes produces "prrrew-prrrew" wing noise that has been suggested as possible display behaviour; sometimes assumes erect posture, flaps wings, and reveals partially concealed crown patch when vocalizing excitedly. Bulky domed nest with side entrance, made of dried grass and small twigs, placed 2-4 m above ground in variety of usually conspicuous sites, often towards outside of dense brush, and wedged in crotch or with support built into base and sides of structure. Clutch 2-3 eggs; no information on incubation; fledging 17-21 days. In Panama, 37% of nests successful, with all recorded losses due to predation.
Movements. Not well known; numbers appear to fluctuate seasonally S of Orinoco, but not clear whether populations are resident or migrant; more information needed.
Status and Conservation. Not globally threatened. Fairly common to common. Usually less numerous than with *M. similis* in areas where the two are sympatric. Tolerant of converted habitats, and occurs in many national parks and other protected areas throughout its large range.
Bibliography. Ames (1971), Anon. (1998a), Bangs & Penard (1921), Best *et al.* (1993), Birdsley (2002), Bond *et al.* (1989), Cintra (1997), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Cracraft (1985), Dyrcz (2002), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (1997, 2003), Hilty & Brown (1986), Lanyon (1984a), Lawrence (1869), Mamani (1998), Miller (1947, 1963), Mobley (2002), Oren & Parker (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Salaman (1994), Sibley & Ahlquist (1985c), Sick (1993, 1997), Skutch (1985), Smith, W.J. (2001), Stotz *et al.* (1996), Thomas (1979b), Tostain *et al.* (1992), Traylor (1977), Traylor & Fitzpatrick (1982), Warter (1965), Wetmore (1972), Willis (1980).

336. **Social Flycatcher**

Myiozetetes similis

French: Tyran sociable **German**: Rotscheitel-Maskentyrann **Spanish**: Bienteveo Sociable
Other common names: Vermilion-crowned Flycatcher

Taxonomy. *Muscicapa similis* Spix, 1825, mouth of River Madeira, Brazil.
Morphological and behavioural evidence suggests genus most closely related to *Legatus*; nesting behaviour links with *Pitangus*. Molecular data support clade consisting of present species and *M. cayanensis* as sister-group to one formed by *M. granadensis* and *M. luteiventris*. Present species may be better split: race *grandis*, with restricted range, differs vocally from widespread nominate; N races *primulus*, *hesperis* and *texensis* may form a separate species. Proposed races *connivens* (Urubamba) and *fiedleri* (Ucayali) included in nominate. Seven subspecies recognized.
Subspecies and Distribution.
M. s. primulus van Rossem, 1930 - W Mexico (S Sonora S to N Sinaloa).
M. s. hesperis A. R. Phillips, 1966 - W Mexico (C Sinaloa and S Zacatecas E to SW Puebla, S at least to SE Oaxaca).
M. s. texensis (Giraud, 1841) - E & S Mexico (from SW Tamaulipas S through Yucatán Peninsula), Belize, much of Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica (except SW).
M. s. columbianus Cabanis & Heine, 1859 - SW Costa Rica and Panama, N coast of Colombia (S from Caribbean lowlands through Magdalena Valley to Huila) and N Venezuela (E to Sucre, S to to N Amazonas and N Bolívar).
M. s. grandis Lawrence, 1871 - W Ecuador (S from W Esmeraldas) and extreme NW Peru (lowlands E of Andes and Pacific slope in Tumbes).
M. s. similis (Spix, 1825) - E Colombia E of E Andes (S from Norte de Santander), SE Venezuela (Amazonas, S Bolívar), French Guiana, E Ecuador, E & C Peru, Amazonian Brazil (except most drainages of R Tocantins and R Xingu) and N Boliva (S to Cochabamba and N Santa Cruz).
M. s. pallidiventris Pinto, 1935 - E Brazil (E Pará E to Paraíba, S to N Rio Grande do Sul), E Paraguay (W at least to Caaguazú) and NE Argentina (Misiones).
Descriptive notes. 16-18·5 cm; 24-27 g. Nominate race has head mostly dark grey to brownish-grey, large bright red to orangish-red coronal patch (mostly concealed), broad white supercilia confluent on forehead (where usually tinged greyish-white) and nearly connecting on nape, auriculars with fine paler shaft streaks; upperparts dull olive-green or brownish-olive, more greyish-olive on hindneck, uppertail-coverts greyish-brown or greyish-olive; wings deep greyish-brown, remiges with pale olivaceous edging, margins paler and more greyish-white to buffy white on inner secondaries, wing-coverts olive or brownish-olive with greyish-white margins (sometimes appearance of two faint wingbars); tail deep greyish-brown, rectrices with pale olive margins; chin and throat white or yellowish-white; underparts, including axillaries and underwing-coverts, bright yellow;



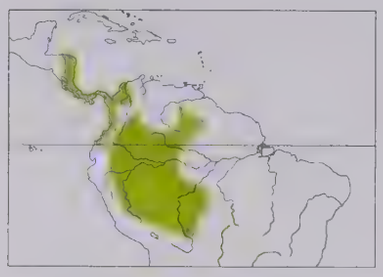
iris brown; bill rather small and stubby, black; legs black. Sexes alike, female on average slightly smaller than male. Juvenile resembles adult, but usually without coronal patch (if present, is very small and pale orange), more greyish-brown (not olivaceous brown) above, remiges and rectrices more broadly edged with rufous on both webs and terminally, and greater and median wing-coverts with buff-cinnamon margins. Races vary only slightly in plumage, mainly in tone of feather fringes on wing, and also tone of concealed coronal patch; *grandis* is larger than nominate, slightly brighter yellow below, and has wider and slightly paler wing-covert margins; *columbianus* said to average smaller than others, with lighter grey in crown, deeper and brighter underparts, paler terminal margins on wing-coverts. VOICE. Variety of loud, excited, generally strident calls; most common is a shrill and piercing "seeá", "tcheiit" or "see-yh!" scream; also various nasal or somewhat shrill, rapid twittering and bickering phrases, as "t-cheer-cheer-che-tiqueer" or "chiir t-chiir t-chirr"; also shrill note repeated several times, sometimes followed by longer and continuously repeated series, "seeu, seeu, see-u-chú", "sree, sree, sree si-si-chuhr", or shorter but still repeated "chirrrr" that probably represents a dawn song. Voice said to differ geographically, e.g. birds E of Andes (nominate race) giving chattered "ti-ti-ti-tíchew, chew" and a single "chew" or "chek", those W of Andes (*grandis*) give chattered "kree-kree-kree".
Habitat. Moist to humid and semi-arid semi-open lowland areas with scattered bushes and trees, shrubby clearings, second growth, forest and woodland canopy and borders, lake and river margins, shady gardens, pastures, cultivated regions, and residential areas; especially numerous near water in some areas. Mostly below 1000 m, but in smaller numbers to 1700 m and occasionally higher, especially when nesting.
Food and Feeding. Insects, also occasionally tadpoles; considerable quantities of small berries, arillate seeds, and other fruits also consumed. Most often in pairs; also in small, sociable family groups for short period after breeding season; large groups often congregate at fruiting trees; generally rather noisy and excitable. Perches, sometimes with partially cocked tail, in open spaces on top or outer edges of vegetation. Forages at varying heights, from ground level to the canopy of large trees, but usually at middle levels; hawks insects by long aerial sallies or in short sallies to vegetation; often drops to the ground to pursue insects; sometimes enters shallow water to catch tadpoles. Fruits taken from a perch or gleaned in quick hovering flight.
Breeding. Season in most areas thought to be rather protracted; recorded in Feb-Jun in Costa Rica and May-Jul in Venezuela (Hato Masaguaral, in Guárico); nest-building observed in Jan (Leticia), Mar (R Frío) and Apr (Santa Marta) in Colombia; laying in Mar-Apr in Panama; nests Aug-Jan in SE Peru; nests found in Oct and Nov in Argentina. Sometimes produces noisy wing-fluttering in flight, has been suggested as possible display behaviour. Bulky nest built by female, domed and with side entrance, made of dried grass, straw, weed stems, small twigs, and often bits of cotton, paper and strands of plastic from grain bags; placed in variety of conspicuous sites, including various man-made structures and sometimes over water, but usually in fork of branch at middle to upper levels (c. 2-15 m) in tree or dense, often thorny bush; occasionally uses nest of another bird as foundation, or fills existing cavity with some nesting material; frequently nests in close proximity to nest of hymenopteran (bee, wasp, or stinging ant), and often in same tree or bush as one or more other tyrannids (especially *Pitangus*, *M. cayanensis*, *Fluvicola*, *Tolmomyias*, etc.). Clutch 2-4 eggs; incubation by female, period 15-16 days; fledging 17-21 days. In Panama, 28% of nests successful, with 68% lost to predation and 4% to other causes. Single brood raised annually, but pair may attempt up to 5 nests/season due to predation.
Movements. Not well known; probably resident in many areas and at least partially migratory in others. In Venezuela, for example, thought to be resident in most of C & W; probably at least partially migratory in *llanos*, being absent during rainy season (c. Jun-Oct), but still unclear whether these populations move long or short distances; scarce, absent or seasonal (present about Apr-Nov) in much of E Venezuela; variable numbers occur in NW Amazonas, where more recorded in Jun than in Dec-Feb. Populations breeding in SE Brazil (Rio de Janeiro) said to be migratory.
Status and Conservation. Not globally threatened. Common to very common in most of range. Thrives in variety of semi-open habitats, including those that have been converted and those in agricultural and residential areas. Occurs in numerous protected areas within its large range.
Bibliography. Ames (1971), Anon. (1998a), Berlepsch & Stolzmann (1906), Binford (1989), Birdsley (2002), Brooks *et al.* (1993), Cintra (1997), Clements & Shany (2001), Cory & Hellmayr (1927), Darlington (1931), Davies *et al.* (1994), Dunajewski (1939), Dyrcz (2002), Fitzpatrick (1980a, 1980c, 1981, 1985a), Guix (1995), Haffer (1975), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Lanyon (1984a), Lee Jones (2004), Lowen *et al.* (1996), Mobley (2002), Monroe (1968), Narosky & Salvador (1998), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson (1997), Robinson & Terborgh (1997), Rodrigues & Santos (2000), do Rosário (1996), Rowley (1984), Sibley & Ahlquist (1985c), Sick (1993, 1997), Skutch (1985), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Terborgh *et al.* (1984), Thomas (1979b), Todd & Carriker (1922), Tostain *et al.* (1992), Traylor (1977), Traylor & Fitzpatrick (1982), Warter (1965), Wetmore (1972), Williams & Tobias (1994), Willis (1980), Zimmer (1937c).

337. **Grey-capped Flycatcher**

Myiozetetes granadensis

French: Tyran à tête grise **German**: Graukappen-Maskentyrann **Spanish**: Bienteveo Cabecigrís

Taxonomy. *Myiozetetes granadensis* Lawrence, 1862, Panama.
Morphological and behavioural evidence suggests genus most closely related to *Legatus*; nesting behaviour links with *Pitangus*. Molecular data indicate strong support for a clade consisting of present species and *M. luteiventris* as sister-group to one formed by *M. cayanensis* and *M. similis*. Race *occidentalis* possibly better merged with nominate; further study required. Three subspecies currently recognized.
Subspecies and Distribution.
M. g. granadensis Lawrence, 1862 - E Honduras, Nicaragua and Costa Rica S to CE Panama.
M. g. occidentalis J. T. Zimmer, 1937 - E Panama (Darién), N & W Colombia (W of Andes) and NW Ecuador (S to N Manabí and S Pichincha).
M. g. obscurior Todd, 1925 - C & E Colombia (lower Magdalena Valley S to SE side of Serranía San Lucas, S from W Meta and Vaupés, and widely E of E Andes) and SE Venezuela (C & S Amazonas, W Bolívar) S to E Ecuador, E Peru (E of Andes), W Brazil (E to N Roraima, W Amazonas and Rondônia) and N Bolivia (S to Cochabamba and N Santa Cruz).
Descriptive notes. 16-18 cm; 28-30 g. Has crown and nape grey, semi-concealed orange-yellow or reddish-orange coronal patch; white forehead extending into rather short, narrow white supercilium to just past eye, dusky loral, suborbital and auricular regions; upperparts mostly olive-green, uppertail-



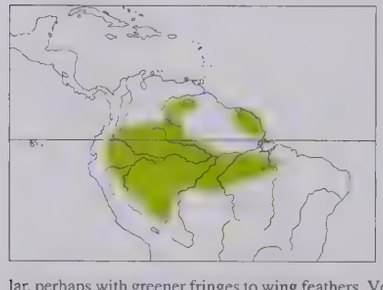
coverts dusky or dark olive with paler edging; wings dusky greyish-brown, wing-coverts with olive margins, lesser coverts pale olive-green, remiges with light yellowish-olive or cinnamon margins; tail dusky, rectrices with light olive margins; chin and throat white or yellowish-white; underparts, including axillaries and underwing-coverts, bright yellow, slight olive tinge on chest side; iris pale brownish-grey; bill rather short, black; legs black. Sexes similar, female sometimes with coronal patch lacking or considerably reduced. Juvenile is essentially like adult, but with greyish-olive tinge on crown and nape, broader and more tawny margins on both webs of rectrices, slightly paler yellow underparts, light tawny-brown or cinnamon edging on wing-coverts and secondaries, paler and more yellowish margins on tertials. Race *obscurior* larger and somewhat darker; *occidentalis* slightly smaller than previous. Voice. Sharp, dry, emphatic, and often incessantly repeated nasal "kip", "bip" or "wic" notes and longer "kip-kee-kew" or "kip-kip-kip-it" series with subtle variations; also harsh, strident, aggressive-sounding staccato notes, "kurr keer ch'beer, k'keer keer jeer k'beer", in interactions; also said to give loud, hoarse, and variously repeated dawn song "kip kip kip-keeuw-kreh" (W of Andes) 2-3 seconds long, and shorter (1-2 seconds) but faster "kip-kip-kip-kip-kip-kip, ke-ke-kree-yí" phrase.
Habitat. Agricultural areas with scattered trees, semi-open and shrubby clearings, humid second growth, overgrown forest borders, occasionally near houses; numerous near standing water, and along rivers and streams. Seems to prefer more humid habitat than congeners. Mostly to 1100 m, but recorded to 1650 m in Costa Rica (along Pacific slope of Cordillera de Talamanca); in small numbers regularly to just over 1200 m in Panama (W Chiriquí) and to 1300 m in Ecuador (Mindo).
Food and Feeding. Insects; considerable quantities of berries and arillate seeds also consumed. Usually in pairs or small, sometimes noisy, family groups, but often alone; sometimes in larger groups of up to a dozen individuals for a period following breeding season. Seems to prefer lower perches, but also perches on top of taller trees. Sallies short to medium distances, sometimes longer, in pursuit of flying insects; occasionally sallies to foliage to glean insects.
Breeding. Breeds Feb-Jun, occasionally to Aug, in Costa Rica and during Feb-May dry season in Panama; nest found in Mar in Colombia (Buenaventura); nests Sept-Jan in SE Peru. Nest a bulky, globular or domed structure with side entrance, composed primarily of weed stems, straw and dried grasses, placed 1-18 m (usually 1·5-8 m) above ground in tree or bush; often nests with congener in same tree or bush. Clutch 2-3 eggs, sometimes 4. No other information.
Movements. Not well known. Probably mainly resident.
Status and Conservation. Not globally threatened. Fairly common to common. Has relatively extensive range; possible occurrence also in NW Peru doubted, as single 1877 specimen from Tumbes may have been confused with *M. similis*, and no subsequent reports. Thrives in secondary habitats and in agricultural and residential areas, and occurs in several national parks and other protected areas throughout its range.
Bibliography. Ames (1971), Anon. (1998a), Birdsley (2002), Blake (1962), Clements & Shany (2001), Cory & Hellmayr (1927), Fitzpatrick (1980a), Haffer (1975), Hilty (2003), Hilty & Brown (1986), Lanyon (1984a), Meyer de Schauensee (1982), Moermond & Denslow (1985), Monroe (1968), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Robinson (1997), Robinson & Terborgh (1997), Schulenberg *et al.* (2001), Sick (1993, 1997), Skutch (1960, 1985), Slud (1960, 1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Terborgh *et al.* (1984), Traylor (1977), Traylor & Fitzpatrick (1982), Warter (1965), Wetmore (1972), Willard *et al.* (1991), Zimmer (1937c).

338. **Dusky-chested Flycatcher**

Myiozetetes luteiventris

French: Tyran à gorge rayée **Spanish**: Bienteveo Pechioscuro
German: Strichelbrust-Maskentyrann
Other common names: Orange-vented Flycatcher

Taxonomy. *Elaenia luteiventris* P. L. Sclater, 1858, River Napo, Ecuador.
Morphological and behavioural evidence suggests genus most closely related to *Legatus*; nesting behaviour links with *Pitangus*. Taxonomic history of this species somewhat turbulent; orginally described within genus *Elaenia*, and subsequently transferred back and forth between current genus and *Tyrannopsis*, largely because of its smaller size and peculiar coloration compared with present congeners. Molecular data indicate strong support for a clade consisting of present species and *M. granadensis* as sister-group to one formed by *M. cayanensis* and *M. similis*. Validity of race *septentrionalis* uncertain. Two subspecies recognized.
Subspecies and Distribution.
M. l. septentrionalis Blake, 1961 - E Surinam, French Guiana and adjacent NE Brazil (Amapá).
M. l. luteiventris (P. L. Sclater, 1858) - E Ecuador and SE Colombia (S from Putumayo and Vaupés) E to SE Venezuela (S Bolívar), S to Amazonian Brazil (E to E Pará and W Maranhão, S to Rondônia and N Mato Grosso), E Peru (Loreto and Madre de Dios, probably also elsewhere) and extreme NW Bolivia (Pando, N La Paz).



Descriptive notes. 14-15 cm; 16·5 g. Plumage is dark olive-brown above, head slightly more greyish-brown and with some faint greyish streaking at side, semi-concealed yellow-orange coronal patch; crown feathers appear rather long; wing feathers variably edged rufous; throat whitish with faint dusky streaking; underparts bright yellow, chest and upper breast with strong olive shading or flammulation and smudgy dark olive streaking; bare parts black. Sexes similar, but female lacks coronal patch or may have patch reduced to some pale yellow feather edges. Juvenile undescribed. Race *septentrionalis* is very similar, perhaps with greener fringes to wing feathers. Voice. Most frequent call a nasal, cat-like "meeow" or softer "neea"; when excited, fast nasal "nyeeuw-nyeeuw, keep-kít" or "neea-ne-wít", sometimes presented as jumbled duet, or simply shortened and often repeated "keeuw" or "nyeeuw" somewhat like voice of *M. granadensis* but more nasal and whining.
Habitat. Shrubby forest borders, clearings with scattered bushes or trees, openings within forest created by treefalls, canopy of *terra firme* and *várzea*, and edges of lakes and rivers. To 600 m.
Food and Feeding. Insects and fruits. Usually in pairs or small groups, sometimes singly; mostly independent of mixed-species flocks. Perches on exposed twigs or on top of vegetation, usually 3-20 m up at edge of tall trees or canopy; erect posture, sometimes with tail cocked; often flicks tail and jerks head when calling or alighting. Sallies short distances or hover-gleans insects from foliage, but occasionally hawks flying insects; regularly visits fruiting trees and shrubs, often mingling with other species, to hover-glean or perch-glean small berries, often at much lower levels.
Breeding. Poorly known. Male in breeding condition in May in Colombia (Vaupés). One nest described: large, bulky, domed structure of grasses, some longer strands of grass hanging below entrance on side, placed not more than 1 m from top of large tree at forest edge. No other information.
Movements. Poorly known; considered to wander rather widely and may be partially migratory.
Status and Conservation. Not globally threatened. Rare to locally uncommon, but perhaps often overlooked; possibly more widespread and more numerous than previously realized. Not well known. Occurs in several national parks and other protected areas throughout its relatively large range, e.g. Alto Orinoco-Casiquiare Biosphere Reserve, in Venezuela, Tambopata-Candamo Reserved Zone and Manu National Park and Biosphere Reserve, in Peru, Tapajós National Park, in Brazil. No known threats, as most of its habitat is still in reasonably pristine condition.
Bibliography. Ames (1971), Anon. (1998a), Bates & Parker (1998), Birdsley (2002), Blake (1961), Clements & Shany (2001), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon (1984a), Meyer de Schauensee (1966, 1982), Meyer de Schauensee & Phelps (1978), Novaes (1978a), Oren & Parker (1997), Parker & Remsen (1987), Peres & Whittaker (1991), Remsen (1977), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), Robinson *et al.* (1988), Schulenberg *et al.* (2001), Sclater (1871a), Sick (1993, 1997), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tostain *et al.* (1992), Traylor (1977), Traylor & Fitzpatrick (1982), Warter (1965), Zimmer (1937c).

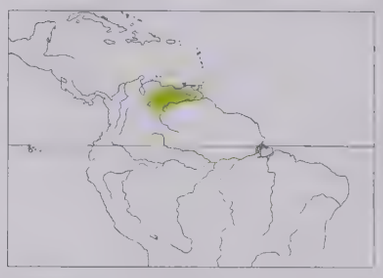
Genus *PHELPSIA* W. E. Lanyon, 1984

339. **White-bearded Flycatcher**

Phelpsia inornata

French: Tyran des llanos **Spanish**: Bienteveo Barbiblanco
German: Schwarzscheitel-Maskentyrann

Taxonomy. *Myiozetetes inornatus* Lawrence, 1869, Valencia, Carabobo, Venezuela.
Affinities uncertain. In past variously placed in genera *Myiozetetes* and *Conopias*, but differs significantly in syringeal morphology and nest architecture. A single syringeal character suggests that it is most closely related to *Pitangus* and *Philohydor*; recent molecular data indicate that it forms a clade with latter (both build cup-shaped nests, details of which not particularly similar), with no apparent affinity to *Pitangus*. Further research and additional molecular data required. Monotypic.
Distribution. N & C Venezuela, from Carabobo, Miranda and Cojedes E to NE Anzoátegui and Delta Amacuro, S to Apure and N Bolívar; possibly also adjacent NE Colombia.



Descriptive notes. 16·5-18 cm; 29 g. Has crown and side of head brownish-black, long white supercilia confluent on nape; upperparts olive-brown; wings olive-brown, narrow yellowish margins on primaries; throat white, prominent and puffy-looking; underparts bright yellow; iris dark; bill very short, stubby, black; legs blackish. Distinguished from similar *Myiozetetes* species by especially puffy-headed appearance, puffy white throat, comparatively stubby bill. Sexes alike. Juvenile undescribed. Voice. Most common call a load, sharp, rising "churup" or "cheedurit", also repeatedly as alarm; duet call a staccato "chéé'ter" given repeatedly, up to 12 couplets by each partner, during territorial challenges, may also be heard a few times early in day.
Habitat. Pastures with scattered trees, small groves of woodland in open to semi-open *llanos*, lighter woodland borders, gallery forest, and trees near ranch buildings. Typically below 500 m.
Food and Feeding. Insects; small fruits taken infrequently. Usually observed in pairs, occasionally in small family groups; fairly quiet and reserved, perching inconspicuously at various heights. Often sallies from perch to the ground in pursuit of prey; also sallies to taller grass and low vegetation; occasionally hawks flying insects or gleans items from foliage.
Breeding. Mar-Aug. Non-breeding helpers sometimes assist nesting pair. During territorial challenges, displays with excited bowing and wing-flutters, calling loudly, and perching higher and out in the open. Nest a nicely formed open cup, composed of an array of fine twigs, petioles, leaf tendrils, rootlets, dried leaf skeletons, and occasionally feathers and horsehair, materials sometimes bound together with spider silk, often covered with bits of lichen (making nest quite cryptic); typically placed fairly high in fork on horizontal tree branch. Clutch 2 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common or common. Very common at Hato Los Indios (R Capanaparo), in SE Apure. Appears to be reasonably adaptable; occurs in agricultural and residential areas.
Bibliography. Aveledo (1986), Berlepsch (1907), Berlepsch & Hartert (1902), Birdsley (2002), Cherrie (1916), Hilty (2003), Lanyon (1984a), Lawrence (1869), Meyer de Schauensee (1966, 1982), Mobley (2002), Phelps & Phelps (1963), Ridgely & Tudor (1994), Rojas *et al.* (1997), Sclater (1871a, 1888), Skutch (1985), Stotz *et al.* (1996), Thomas (1979a), Traylor (1977), Varty *et al.* (1986), Wetmore (1939).

Genus *PITANGUS* Swainson, 1826

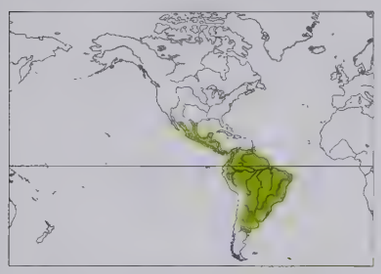
340. **Great Kiskadee**

Pitangus sulphuratus

French: Tyran quiquivi **German**: Schwefelmaskentyrann **Spanish**: Bienteveo Común

Other common names: Greater Kiskadee, Kiskadee Flycatcher

Taxonomy. [*Lanius*] *sulphuratus* Linnaeus, 1766, Cayenne.
Affinities uncertain; may be closely related to *Myiozetetes*, given numerous similarities in nesting behaviour. Populations in Amazonia, including slightly larger birds of SE Colombia and the Guianas, may be better represented as a single race (nominate), owing to lack of clear distinctions and to the existence of gradual clines of increasing wing length N & S of Amazon that are not correlated with any observed colour differences. Formal revision, including genetic survey, is necessary in order to determine the most appropriate taxonomic designations. Ten subspecies currently recognized.
Subspecies and Distribution.
P. s. texanus van Rossem, 1940 - extreme S USA (lower Rio Grande) and E Mexico (S to S Veracruz).
P. s. derbianus (Kaup, 1852) - W Mexico (Sonora S to Isthmus of Tehuántepec).
P. s. guatimalensis (Lafresnaye, 1852) - SE Mexico (S Veracruz, E Oaxaca, Chiapas, Tabasco, and Yucatán Peninsula), Guatemala, Belize and El Salvador S to C Panama.
P. s. rufipennis (Lafresnaye, 1851) - N Colombia (Caribbean coast and lower Magdalena Valley), N & C Venezuela (E to W Sucre and Monagas, S to N Amazonas and N Bolívar).
P. s. caucensis Chapman, 1914 - W & S Colombia (SW Bolívar, R Cauca and upper R Magdalena).
P. s. trinitatis Hellmayr, 1906 - E Colombia (R Meta), S & E Venezuela (Amazonas, and E Sucre S to Orinoco Delta and E Bolívar) and NW Brazil (R Surumú and R Cotinga); also Patos I and Trinidad.
P. s. sulphuratus (Linnaeus, 1766) - the Guianas, N Brazil (S to Amazon, E to Amapá and Marajó I), and E of Andes from SE Colombia and E Ecuador S to SE Peru.
P. s. maximiliani (Cabanis & Heine, 1859) - E & S Brazil (Maranhão and Piauí S to Mato Grosso, Goiás and Santa Catarina), N Bolivia (Beni) and Paraguay.
P. s. bolivianus (Lafresnaye, 1852) - E Bolivia (Cochabamba S to Tarija).
P. s. argentinus Todd, 1952 - Argentina (S to E Mendoza, Córdoba and Río Negro), E Paraguay, extreme SE Brazil (Rio Grande do Sul) and Uruguay.
Introduced in Bermuda (*trinitatis*).



Descriptive notes. 20·5-23·5 cm; 53-68 g. Has blackish crown, semi-concealed yellow coronal patch; side of head blackish, broad white supercilia extending from forehead to nape (where confluent or nearly so); upperparts olive-brown to brownish-olive, uppertail-coverts somewhat suffused and margined with cinnamon-rufous; wings more or less deep greyish-brown to olive-brown, remiges and wing-coverts with cinnamon-rufous bases and margins, remiges also with dusky tips; tail greyish-brown or dusky, fairly broad cinnamon to rufous edging on outer webs and extensive cinnamon-rufous edging on inner webs; chin, throat and malar region prominently white, underparts bright yellow; iris dark; bill heavy, straight, relatively long, black, slightly more brownish on lower part of lower mandible; legs blackish. Sexes alike. Juvenile is similar to adult, but lacks yellow on crown, has broader, paler cinnamon-rufous margins on wing-coverts and inner secondaries. Races vary mainly in size (clinal variation) and colour tones, nominate being more or less intermediate between those to N & S but tending to be generally darker brown above and to have slightly smaller bill; *texanus* is large, rather dark, margins of wing feathers deep rufous; *derbianus* and *guatimalensis* are slightly paler overall than races farther S; *rufipennis* tends to be smaller, has upperparts more rufous-brown, extensive rufous in wings and tail; *trinitatis* is most like previous, but with much narrower rufous margins on wing-coverts, less rufous on remiges, much less rufous on rectrices (narrower margin on outer web, rufous inner third of inner web); *caucensis* is similar to previous; *maximiliani* has somewhat heavier bill than nominate, more white on forehead, less orange in coronal patch, paler underparts; *bolivianus* is larger and longer-winged than nominate, has heavier bill, paler brown upperparts, very narrow and lighter rufous margins on primaries; *argentinus* is similar to last. Voice. Quite vocal and rather noisy; variety of loud calls, the most common "kiss-ka-dee", with much variation in number of "dee" notes at end of series; also loud "k-reah" or "kih-kerrr"; dawn song described as raucous "kyah k-yah zzk-zzik ky-ar" or "beeeww-biew-prrrr-beeeww", repeated, often including sonorous "prrr" rattle, and with some longer variations; also softer churring notes around nest, and shrill "eeek" when mobbing predators.
Habitat. Wide variety of habitats, including busy residential and even urbanized areas, semi-open cultivated areas, open grassland and pasture with scattered trees and bushes; also second growth, dry forest edges, gallery forest margins, larger clearings within and edges of primary forest (especially near water). Mostly below 1600 m, occasionally higher.
Food and Feeding. Diet extremely variable, mainly insects and fruit, but also small vertebrates, including nestlings of smaller birds, fish, lizards, snakes, frogs, tadpoles and even mice, as well as earthworms and spiders. Usually alone or in pairs, occasionally in small family groups. Regularly perches in conspicuous place, often at lower levels and in open. Generally hawks insects from a variety of low and open perches, often dropping to the ground; fruits taken by hover-gleaning or perch-gleaning. Fish caught by diving, in manner much like that of a kingfisher (Alcedinidae).
Breeding. Feb-Jun, occasionally Oct, in Mexico; in Colombia, nestlings in Feb and Apr-May (Santa Marta), nest-building in Mar (Leticia) and May (NE Meta); breeds Mar-Sept in Venezuela; mainly Feb-May, and recorded in all months except Sept, in Trinidad; Oct-Feb in Argentina; up to three broods in a season. Partners often raise crest and give wing-shivering display when vocalizing to one another. Nest built by both sexes, a large and bulky domed structure with side entrance, composed of great variety of materials, primarily differently sized grasses, weed stems, straw and small twigs, often incorporating mosses, lichen, string, rope, bits of plastic, rags, cotton, paper, other refuse, and sometimes whole nests of smaller birds; often long strands of vegetation hanging below entrance; for seven nests in Argentina, mean height 28 cm, width 21·6 cm, depth 25·6 cm, entrance diameter 8·1 cm; placed prominently at variable height (1-15 m) and in wide range of sites, including tree limb, bush, cactus, artificial structure (e.g. telephone pole, windmill tower, roof overhang); occasionally built in cavity, and sometimes in close proximity to nest of hymentopteran (bee, wasp or ant); completely tolerant of other birds nesting close by, often nests close to *Myiozetetes* species, but very aggressive towards potential nest predators. Clutch 3-4 eggs, sometimes 5 in S of range; sometimes lays in open cup, usually before dome of nest completed; incubation by female, period 16-17 days; chicks fed by both sexes, fledging period 17-18 days, sometimes to 21 days (uncertain report of 15 days). Parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Not well known; thought to be resident in most of range. Apparently leaves higher elevations and colder parts of S Brazil in austral winter; movement more apparent in Argentina, where a bird ringed in Santiago del Estero was recaptured in Jan in Santa Catarina (SE Brazil), c. 2000 km to E; more research necessary to determine seasonal movement patterns. Vagrants recorded in several areas, including Baja California and N & C Chile; accidental in Falkland Is.
Status and Conservation. Not globally threatened. Common to very common. Estimated global population c. 20,000,000 individuals. Has apparently increased in both range and abundance as a result of previously closed forest being opened up through various human activities; has also benefited from results of water irrigation, which has brought vegetation to semi-arid areas. Reasons for this species' absence from regions W of Andes are unclear.
Bibliography. Ames (1971), Anon. (1998a), Babarskas *et al.* (2003), Baicich & Harrison (1997), Barrows (1883), Bent (1942), Binford (1989), Birdsley (2002), Brooks *et al.* (1993), Brush & Fitzpatrick (2002), Cabanis & Heine (1859-1860), Canevari *et al.* (1991), Cintra (1997), Clements & Shany (2001), Collins *et al.* (1990), Contreras (1997), Cory & Hellmayr (1927), Davis (1941), Di Giacomo (2004), Ferreira de Vasconcelos (2004), ffrench (1991), Fitzpatrick (1980a, 1980c, 1981, 1985a), Fjeldså & Krabbe (1990), Haffer (1975), Haffer & Fitzpatrick (1985), Harris (1998), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hellmayr (1906a), Henderson (2002), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Johnson (1967), Kaufman (1996), Klimaitis & Moschione (1987), Lago-Paiva (1996), Lanyon (1984a), Leveque (1979), Lever (1987), Llambías *et al.* (2001), Longo *et al.* (2000), Lowen *et al.* (1996), Maragliano & Montalti (1995), Mason (1985), Miserendino (1998), Mobley (2002), Narosky & Salvador (1998), Oren & Parker (1997), de la Peña (1987, 1988, 1995), Price *et al.* (1995), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson (1997), Robinson & Terborgh (1997), do Rosário (1996), van Rossem (1940), Rowley (1984), Short (1975), Sibley & Ahlquist (1985c), Sick (1993, 1997), Skutch (1985), Slud (1964), Smith (1962), Stiles & Skutch (1989), Stotz *et al.* (1996), Thomas (1979a), Todd (1952), Todd & Carriker (1922), Tostain *et al.* (1992), Traylor (1977), Traylor & Fitzpatrick (1982), Warter (1965), Wetmore (1972), Zimmer (1937c).

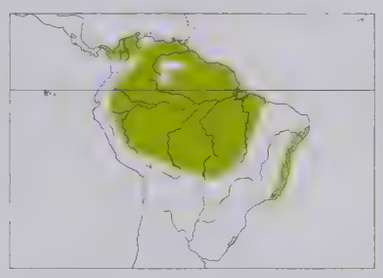
Genus *PHILOHYDOR* W. E. Lanyon, 1984

341. **Lesser Kiskadee**

Philohydor lictor

French: Tyran licteur **German**: Liktormaskentyrann **Spanish**: Bienteveo Chico

Taxonomy. *L[anius] Lictor* M. H. K. Lichtenstein, 1823, Belém, east Pará, Brazil.
Long considered close relative of *Pitangus*; on basis of a single syringeal character, suggested these two form a clade; substantial differences in morphology and behaviour, as well as molecular data, however, suggest otherwise. Molecular data indicate possible close relationship with *Phelpsia*, but additional evidence required in order to test this hypothesis. Two subspecies recognized.
Subspecies and Distribution.
P. l. panamensis Bangs & T. E. Penard, 1918 - E Panama (E from Canal Zone) and Caribbean coast of Colombia (Atrato E to Santa Marta and lower R Magdalena).
P. l. lictor (M. H. K. Lichtenstein, 1823) - Venezuela and the Guianas S to E Colombia, E Ecuador and E Peru, Amazonian & E Brazil (E to Amapá, Maranhão and W Piauí, S to Goiás and N Mato Grosso do Sul, and from Pernambuco S to Rio de Janeiro) and N Bolivia (S to Cochabamba and N Santa Cruz).



Descriptive notes. 15-18 cm; 25 g. Has black or sooty crown, large bright yellow coronal patch (semi-concealed), conspicuous white supercilia confluent or nearly so on nape, black or sooty head side with some greyish tinge on lores; upperparts mostly plain olive, uppertail-coverts greyish-brown or dark olive; wings deep greyish-brown with paler margins, remiges (and sometimes greater wing-coverts) with pale cinnamon or rufous edging; tail dark greyish-brown, central rectrices with cinnamon or rusty margins, lateral feathers edged paler greyish-brown, inner webs of all rectrices with narrow (broader basally) pale cinnamon margins; chin, throat and malar region white; underparts, including axillaries and underwing-coverts, bright yellow; iris dark; bill long, slender, blackish; legs black or blackish-brown. Distinguished from similar *Myiozetetes* species and *Pitangus* by smaller size, more slender proportions, also more sedate behavior and very different vocalizations. Sexes alike, female slightly smaller than male. Juvenile is similar to adult, but nape paler, crown with just a little or no yellow, upperparts more brownish-olive, rufous margins on wings and tail more prominent, underparts paler yellow. Race *panamensis* is decidedly smaller than nominate. Voice. Calls a vigorous, buzzy, rather nasal "dzay" or "dzweey", or more prolonged "dzay-dzwey-dwzee-zwee" with first note strongest and rising slightly; also "keekzi-deeée", "queé-be" and "dree, dear-wrr"; partners also give chattery "ca-déde" in greeting.
Habitat. Shrubby vegetation, low trees, snags and stumps near open water or marshy, shrubby pasture, especially along margins of lakes, ponds, slow-moving rivers, oxbow lakes; sometimes mangrove borders and wooded lagoons. Mainly below c. 500 m; recorded to 1300 m in Venezuela (Lara).
Food and Feeding. Insects. Usually in pairs, occasionally alone or in small groups of 3-4; most often perches at lower levels, usually not higher than c. 3 m, above ground or open water. Sallies to vegetation or surface of standing water, occasionally dropping to ground, in pursuit of prey.
Breeding. Two nests found in Jun (Caquetá) and two males in breeding condition in Jul (César) in Colombia; breeds Jun-Oct in Venezuela (W Apure); Oct-Jan in SE Peru. Excited wing-fluttering and raising of crown feathers by partners when greeting. Nest an open saucer or cup-shaped structure composed of rather coarse material, including small twigs and grasses, lined with finer materials such as rootlets, leaves and grass, generally placed on a stump or low bush, often over water; some suggestion, from limited observations, that side walls sometimes built up in less sheltered placements, but this questionable. Clutch 2-3 eggs. Family groups often roost side by side, touching one another. No other information.
Movements. Probably resident throughout range. One report of possible vagrant in Argentina (N Buenos Aires) may be erroneous, and confirmation required.
Status and Conservation. Not globally threatened. Fairly common. Occurs in many national parks and other protected areas throughout its relatively large range. Much of this species' habitat within its area of distribution remains in pristine or near-pristine condition.
Bibliography. Ames (1971), Anon. (1998a), Bangs & Penard (1918), Bates & Parker (1998), Birdsley (2002), Canaday & Jost (1997), Canevari *et al.* (1991), Carriker (1910), Clements & Shany (2001), Cruz & Andrews (1989), Dubs (1992), Dyrcz (2000b), Fitzpatrick (1980c, 1981, 1985a), Haffer (1975), Haverschmidt (1961, 1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon (1984a), Mobley (2002), Novaes (1978a), Oren & Parker (1997), Penard & Penard (1910), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson (1997), Sick (1993, 1997), Schulenberg *et al.* (2001), Smith (1962), Snyder (1966), Stotz *et al.* (1996), Terborgh *et al.* (1984), Tostain *et al.* (1992), Traylor (1977), Traylor & Fitzpatrick (1982), Warter (1965), Wetmore (1972), Willis (1962, 1980), Willis & Eisenmann (1979), Willis & Oniki (1990), Young (1929), Zimmer (1930).



PLATE 41

inches 3

cm 8

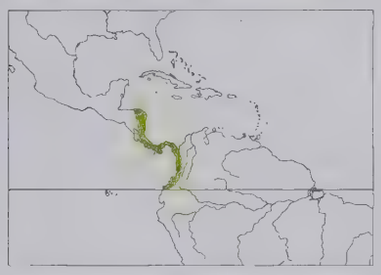
Genus *CONOPIAS* Cabanis & Heine, 1859

342. White-ringed Flycatcher

Conopias albovittatus

French: Tyran diadème **German**: Weißnacken-Maskentyrann **Spanish**: Bienteveo del Chocó

Taxonomy. *Pitangus albovittatus* Lawrence, 1862, Isthmus of Panama.
Has been hypothesized, on basis of hole-nesting behaviour, that genus may be most closely related to *Myiodynastes*, with this clade basal to a "*Tyrannus* group" that also includes *Megarynchus*, *Tyrannopsis*, *Empidonomus* and *Griseotyrannus*; molecular-sequence data, however, do not support an affinity between these two genera, but strongly suggest that present genus is part of that group to the exclusion of *Myiodynastes*. This species was formerly placed with *C. parvus* in a separate genus, *Coryphotriccus*, on grounds mainly of slightly larger bill and presence of a coronal patch, but syringeal morphology is similar to that of present genus. The two are sometimes considered conspecific, but differ in plumage and, especially, voice; furthermore, molecular-sequence data indicate substantial divergence between them, but also that they are closely related and represent a sister-group to a clade consisting of *C. cinchoneti* and *C. trivirgatus*. Validity of race *distinctus* questionable; closer study required. Two subspecies currently recognized.
Subspecies and Distribution.
C. a. distinctus (Ridgway, 1908) - E Honduras, Nicaragua, Costa Rica and W Panama.
C. a. albovittatus (Lawrence, 1862) - E Panama (E from Canal Zone), W Colombia (Chocó S to Nariño) and NW Ecuador (Esmeraldas, NW Pichincha and adjacent SW Imbabura).



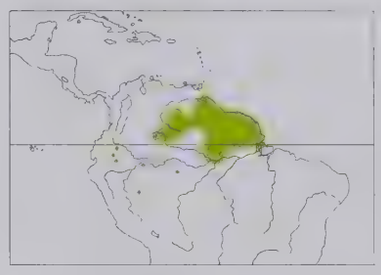
Descriptive notes. 15-16·5 cm; 24 g. Nominate race has crown black to dark sooty brownish, large lemon-yellow to canary-yellow coronal patch (mostly concealed); prominent white supercilia meeting on forehead, broader at rear and confluent (or very nearly so) on nape; loral, suborbital, postocular and auricular regions black to dark sooty brownish, fine whitish shaft streaks in suborbital area and on anterior auriculars; upperparts largely greyish-olive-green to dark olive or olive-brown; wings dusky, browner than upperparts, narrow whitish or pale yellowish-white margins on secondaries and tertials, pale greyish-brown or olive edging on wing-coverts, less prominent darker greyish-brown margins on primaries; tail feathers dark greyish-brown with lighter grey-brown or olive margins; chin, throat and malar area white, underparts bright canary-yellow, axillaries and underwing-coverts as underparts; iris blackish; bill rather long, black; legs blackish. Distinguished from very similar *C. parvus* by distinctive white throat. Sexes alike, female on average smaller than male. Juvenile is similar to adult, but with more brownish upperparts, rusty barring on crown, no yellow coronal patch, wing-coverts and rump feathers with cinnamon margins, more buffy yellow edging on tertials. Race *distinctus* is said to be larger than nominate, more greyish-olive above, paler yellow below, with more extensive blackish area on side of head. Voice. Call very distinctive, commences with a long note, followed by rapid, rattling or whirring, repetitive trill, "tre-r-r-r-r, tre-r-r-r-r...", "kree-ee-ee-eer", or short, slightly nasal and descending "wheeerr" whistle followed by rattling "qua-tre-e-e-e-e-e-e", "wheeereeeeee-e-e-e" or "wheeeurrrrr-rreek" that rises in pitch and may slow near end; also gives prolonged, relatively higher-pitched, petulant trill that slows and ends with several discrete notes. Frequent bill-snapping during flight reported.
Habitat. Canopy and borders of humid forest; occasionally ventures out into clearings with tall trees next to mature forest, also in taller trees along waterways. Mostly below 1000 m, but regularly to 1350 m in Panama (Cerro Pirre, in Darién).
Food and Feeding. Insects and spiders; some berries also taken. Alone, in pairs, or in small groups of up to five individuals; occasionally accompanies mixed-species flocks. Generally perches at higher levels in canopy, often directly on top of crown foliage or on exposed twig, scanning leaves and branches below; sallies among foliage, flits actively about the vegetation.
Breeding. Mar-Jun in Costa Rica. Nest c. 10-15 m up in old woodpecker (Picidae) hole, natural tree hole or crevice, or niche in bromeliad cluster; no other details. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Details unknown; wanders to some degree, but probably resident in most areas.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Occurs in Río Negro Jaguar Reserve, in Costa Rica. In Ecuador, widespread in Esmeraldas, numerous NW of Alto Tombo, and common E of Muisne, at Bilsa, and at Playa de Oro; occurs in Cerro Blanco Forest Reserve. Probably tolerant of some forest degradation, as it is found in second growth and in trees in clearings. Field studies of this poorly known species needed.
Bibliography. Anon. (1998a), Birdsley (2002), Cory & Hellmayr (1927), Hilty & Brown (1986), Howell & Webb (1995a), Jahn & Mena (2002i), Lanyon (1984a), Mobley (2002), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Salaman (1994), Skutch (1972), Slud (1960, 1964), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1972).

343. Yellow-throated Flycatcher

Conopias parvus

French: Tyran de Pelzeln **German**: Weißring-Maskentyrann **Spanish**: Bienteveo Guayanés
Other common names: Yellow-crowned Flycatcher

Taxonomy. *Pitangus parvus* Pelzeln, 1868, Marabitanas, Rio Negro, Brazil.
Has been hypothesized, on basis of hole-nesting behaviour, that genus may be most closely related to *Myiodynastes*, with this clade basal to a "*Tyrannus* group" that also includes *Megarynchus*, *Tyrannopsis*, *Empidonomus* and *Griseotyrannus*; molecular-sequence data, however, do not support an affinity between these two genera, but strongly suggest that present genus is part of that group to the exclusion of *Myiodynastes*. This species was formerly placed with *C. albovittatus* in a separate genus, *Coryphotriccus*, on grounds mainly of slightly larger bill and presence of a coronal patch, but syringeal morphology is similar to that of present genus. The two are sometimes considered conspecific, but differ in plumage and, especially, voice; furthermore, molecular-sequence data indicate substantial divergence between them, but also that they are closely related and represent a sister-group to a clade consisting of *C. cinchoneti* and *C. trivirgatus*. Monotypic.
Distribution. S & E Venezuela (W Amazonas E locally to E Bolívar), extreme E Colombia (E Vaupés, Guainía), very locally NE Ecuador (E Sucumbíos, extreme SE Pastaza), extreme NE Peru (N Loreto); also the Guianas, and Brazil primarily N of Amazon and R Solimões (locally from N Roraima and upper R Negro S to lower R Negro near Manaus, E to Amapá; also recorded S of Tefé near R Urucu, in W Amazonas).



Descriptive notes. 16·5 cm. Has crown black to dark sooty brownish, large lemon-yellow to canary-yellow coronal patch (mostly concealed); prominent white supercilia meeting on forehead, broader at rear and confluent (or very nearly so) on nape; loral, suborbital, postocular and auricular regions black to dark sooty brownish, fine whitish shaft streaks in suborbital area and on anterior auriculars; upperparts greyish olive-green to dark olive or olive-brown; wings dusky, browner than upperparts, narrow whitish or pale yellowish-white margins on secondaries and tertials, pale greyish-brown or olive edging on wing-coverts, less prominent darker greyish-brown margins on primaries; tail feathers dark greyish-brown with lighter greyish-brown or olive margins; throat and entire underparts, including axillaries and underwing-coverts, plain canary-yellow; iris blackish; bill rather long, black; legs blackish. Differs from very similar *C. albovittatus* in yellow, not white, throat; from *C. trivirgatus* mainly in larger size, blacker crown, yellow coronal patch. Sexes alike. Juvenile undescribed. Voice. Call a distinctive quick, rhythmic, petulant-sounding, and nearly trilled or ringing "quee-le-le", "cue-le-le" or "weedle-de, weedle-de-wee", rather loud and often repeated numerous times.
Habitat. Canopy and borders of wet and humid forest, taller second growth, and occasionally among scattered trees in forest clearings. Mostly below 1000 m, sometimes ranging to 1300 m.
Food and Feeding. Insects; fruits sometimes also taken. Forages mostly in pairs or small groups, occasionally singly; also joins mixed-species flocks but seems not to follow them, and spends equal amount of time in foraging independently. Tends to remain at higher levels in canopy, often perching on top of crown foliage or on exposed twig; frequently changes perches, and bobs head; rarely descends to lower levels, even along forest edge. Actively flits about the vegetation; perch-gleans prey, or makes short sallies to vegetation and branches to hover-glean insects (sometimes fruits); less often, hawks flying insects from the air.
Breeding. Details of nest structure not very well known, but nest reported as being cup-shaped; placed usually rather high up in natural tree hole or cavity, sometimes old woodpecker (Picidae) hole, stuffed with grasses and other fibrous materials; at least one instance of abandoned pendant and bag-shaped nest of a Yellow-rumped Cacique (*Cacicus cela*) being used, the female repeatedly entering with nest material, apparently assembling some structure or modifying bottom of existing nest. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Details unknown; wanders to some degree, but probably resident in most areas.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Possibly more widespread in Colombia; very local in NE Ecuador, only two recent records. Occurs in Jaú National Park, in Brazil. Probably tolerant of some forest degradation, as it occurs also in second growth and in trees in clearings. The only member of genus for which published information on nest and eggs exists, although other details of breeding biology unknown; focused field studies and observations necessary.
Bibliography. Álvarez & Whitney (2003), Anon. (1998a), Birdsley (2002), Clements & Shany (2001), Cory & Hellmayr (1927), Friedmann (1948), Gilliard (1941), Haverschmidt (1968, 1973), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon (1984), Meyer de Schauensee (1982), Mobley (2002), Naka (2004), Novaes (1978a), Peres & Whittaker (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992), Whittaker & Oren (1999).

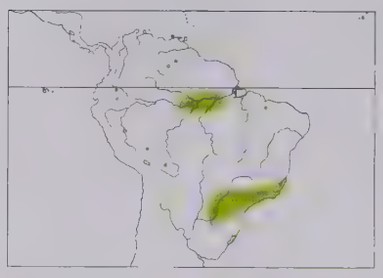
344. Three-striped Flycatcher

Conopias trivirgatus

French: Tyran à triple bandeau **German**: Olivbrust-Maskentyrann **Spanish**: Bienteveo Trilistado

Taxonomy. *M[uscicapa] trivirgata* Wied, 1831, Bahia, Brazil.
Has been hypothesized, on basis of hole-nesting behaviour, that genus may be most closely related to *Myiodynastes*, with this clade basal to a "*Tyrannus* group" that also includes *Megarynchus*, *Tyrannopsis*, *Empidonomus* and *Griseotyrannus*; molecular-sequence data, however, do not support an affinity between these two genera, but strongly suggest that present genus is part of that group to the exclusion of *Myiodynastes*. Molecular data strongly indicate that present species and *C. cinchoneti* are sister-species, most closely related to a clade consisting of *C. albovittatus* and *C. parvus*. Races widely separated geographically, possibly represent two separate species. Two subspecies currently recognized.
Subspecies and Distribution.
C. t. berlepschi E. Snethlage, 1914 - Venezuela (S Bolívar), extreme NE Ecuador (E Sucumbíos, E Napo), N Brazil (both banks of lower Amazon, from Manacapurú and Tefé E to Óbidos and Santarém, also Maranhão), E Peru (Loreto, Ucayali, Madre de Dios) and NC Bolivia (Cochabamba).
C. t. trivirgatus (Wied, 1831) - SE Brazil (SE Bahia S to Paraná), E Paraguay (E from Paraguarí) and NE Argentina (Misiones, NE Corrientes).
Descriptive notes. 13·5-14·5 cm. Smallest member of genus. Nominate race has crown and side of head dusky brown, crown completely encircled by long white supercilia from base of bill (not quite connecting across forehead); upperparts mostly rather pale olive, wings and tail dusky, wing-coverts with faint paler tips, tertials with paler margins; bright lemon-yellow below, faint olive tinge on

On following pages: 345. Lemon-browed Flycatcher (*Conopias cinchoneti*); 346. Golden-bellied Flycatcher (*Myiodynastes hemichrysus*); 347. Golden-crowned Flycatcher (*Myiodynastes chrysocephalus*); 348. Baird's Flycatcher (*Myiodynastes bairdii*); 349. Sulphur-bellied Flycatcher (*Myiodynastes luteiventris*); 350. Streaked Flycatcher (*Myiodynastes maculatus*); 351. Boat-billed Flycatcher (*Megarynchus pitangua*); 352. Sulphury Flycatcher (*Tyrannopsis sulphurea*); 353. Variegated Flycatcher (*Empidonomus varius*); 354. Crowned Slaty Flycatcher (*Griseotyrannus aurantioatrocristatus*).



breast; iris dark; bill long, narrow, blackish; legs blackish. Differs from similar *C. parvus* mainly in somewhat smaller size, duller crown without yellow patch, greater contrast between paler upperparts and dark wings; from *Myiozetetes similis* in smaller size, proportionately longer and narrower bill, yellow (not white) throat, no reddish margins on wing feathers. Sexes alike. Juvenile undescribed. Race *berlepschi* is smaller than nominate, has narrower bill, less blackish crown, paler and more yellowish-green upperparts, more prominent greenish tips on tail-coverts, wider and more defined yellowish-grey tips on wing-coverts, no olive tinge on chest and sides. VOICE. Most common call an abrasive and jarring "jew" or "jeeuw", swiftly and frantically repeated; in SE Peru a rather thick-sounding and low-pitched "chu-burr", repeated numerous times and nearly simultaneously by pair-members; call in SE Brazil said to be a muffled "j-j-j".

Habitat. Canopy and borders of humid forest and *várzea*; mostly below 300 m, but observed at 950 m in Venezuela.

Food and Feeding. Insects. Most often seen in pairs or small groups; regularly associates with mixed-species flocks, but appears to spend equal time in foraging alone. Moves through canopy or along forest edge, or perches conspicuously in outer foliage or on top of well-exposed leaves high in crown. Prey caught by aerial hawking, also by short-distance sallies to vegetation.

Breeding. Pair in Argentina in Nov taking leaves to old woodpecker (Picidae) hole 6 m up in broken branch; may compete for suitable cavities with other birds, as said to behave aggressively towards *Myiodynastes maculatus*; said also to establish itself in cacique (*Cacicus*) colonies, perhaps to appropriate hanging nests. No other information.

Movements. Details unknown; wanders to some degree, but probably resident in most areas.

Status and Conservation. Not globally threatened. Rare to locally uncommon. Occurs in Pacaya-Samiria National Reserve, in Peru, Madidi National Park and Pilón Lajas Biosphere Reserve, in Bolivia, Caaguazú, San Rafael and Ybycuí National Parks, in Paraguay, Iguaçu, Jaú and Tapajós National Parks, in Brazil, and Iguazú National Park, in Argentina. Has relatively large range in which much of its habitat is still in good condition. Further study required in order to ascertain more about its ecology and breeding biology.

Bibliography. Begazo & Valqui (1998), Birdsley (2002), Brooks *et al.* (1993), Canevari *et al.* (1991), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Hayes (1995), Hilty (2003), Lanyon (1984a), Lowen *et al.* (1996), Meyer de Schauensee (1982), Mobley (2002), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Oren & Parker (1997), de la Peña (1988), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Traylor (1958), Whittaker & Oren (1999).

345. **Lemon-browed Flycatcher**

Conopias cinchoneti

French: Tyran à sourcils jaunes **Spanish**: Bienteveo Cejiamarillo
German: Gelbbrauen-Maskentyrann

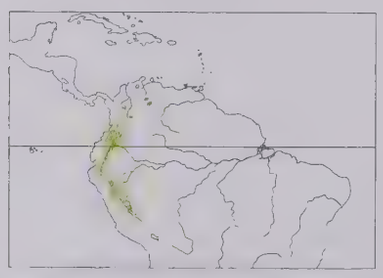
Taxonomy. *T[yrannus] cinchoneti* Tschudi, 1844, highlands of Junín, Peru.

Has been hypothesized, on basis of hole-nesting behaviour, that genus may be most closely related to *Myiodynastes*, with this clade basal to a "*Tyrannus* group" that also includes *Megarynchus*, *Tyrannopsis*, *Empidonomus* and *Griseotyrannus*; molecular-sequence data, however, do not support an affinity between these two genera, but strongly suggest that present genus is part of that group to the exclusion of *Myiodynastes*. Molecular data strongly indicate that present species and *C. trivirgatus* are sister-species, most closely related to a clade consisting of *C. albovittatus* and *C. parvus*. Geographical limits of races and the differences between them not well defined; may require revision. Two subspecies currently recognized.

Subspecies and Distribution.

C. c. icterophrys (Lafresnaye, 1845) - W Venezuela (Sierra de Perijá, W slope of Andes in W Mérida and W Trujillo, E slope in NW Barinas), Colombia (locally in all three ranges, but doubtfully on E slope of E Andes) and extreme NW Ecuador (Carchi).

C. c. cinchoneti (Tschudi, 1844) - E Ecuador (foothills and subtropical zone on E slope) and N & C Andes of Peru (San Martín, Huánuco, Junín, Cuzco).



Descriptive notes. 16 cm. Has head mostly olive-green, with bright greyish-yellow forehead and broad pale yellow supercilia (nearly confluent on nape); upperparts mostly dark olive; wings and tail dusky brownish, paler edges of tertials; bright yellow below, olive tinge on side of chest; iris dark; bill rather long, black; legs blackish. Differs from *C. parvus* mainly in yellow (not white) supercilium, no yellow coronal patch. Sexes alike. Juvenile undescribed. Race *icterophrys* is very like nominate, perhaps less extensive yellow on forehead, narrower supercilia, paler throat. VOICE. Distinctive call an odd high-pitched nasal, twittering and petulant-sounding "whee-ee-ee-ee, wheedididídí-dí" or "pa'treeer-pa'treeer-pa'treeer", often associated with head-bobbing.

Habitat. Relatively small forest clearings, larger openings with scattered tall trees, and edges of wet and sometimes steep montane cloudforest. Mostly 700-1900 m, occasionally to 2150 m; locally down to 400 m on Pacific slope in Colombia (Anchicayá Valley).

Food and Feeding. Insects and small fruits. Usually in pairs or in small, rather loose groups of 3-5 individuals; occasionally joins mixed-species flocks, but most often forages independently. Perches at higher levels on top of canopy leaves or exposed twigs and branches, well in the open; rather restless, seems not to perch for very long in one place. Makes short sallies to foliage to glean items, sometimes hovering briefly.

Breeding. No information. Group of three individuals observed at an inactive Russet-backed Oropendola (*Psarocolius angustifrons*) colony in E Ecuador, one bird briefly clinging to entrance of a nest, but not known whether they bred there.

Movements. Details unknown; wanders to some degree, and considered to have rather large home range, but probably resident in most areas.

Status and Conservation. Not globally threatened. Rare to locally uncommon. Fairly common in Serranías Cofán (Sucumbíos), in E Ecuador. Occurs in Tambito Nature Reserve, in Colombia, Podocarpus National Park, in Ecuador, and Machu Picchu Historical Sanctuary, in Peru. Tolerant of some forest degradation.

Bibliography. Birdsley (2002), Chapman (1917c, 1921), Clements & Shany (2001), Cory & Hellmayr (1927), Hilty (1997, 2003), Hilty & Brown (1986), Lanyon (1984a), Meyer de Schauensee (1982), Mobley (2002), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Walker (2001), Zimmer (1937c).

Genus *MYIODYNASTES* Bonaparte, 1857

346. **Golden-bellied Flycatcher**

Myiodynastes hemichrysus

French: Tyran à ventre d'or Spanish: Bienteveo Ventridorado
German: Braunbart-Maskentyrann

Taxonomy. *Hypermitres hemichrysus* Cabanis, 1861, Los Frailes, Costa Rica.

Affinities of genus uncertain; long hypothesized as being closest to *Conopias*, largely on basis of similar hole-nesting tendencies. Genus probably monophyletic, although this only weakly supported by recent analyses of molecular-sequence data (likely due to inappropriate markers for the apparently long branches and deep level of divergence within genus). Results of separate analyses of plumage/syringeal morphology and molecular data were not completely congruent, but do suggest some strong tentative conclusions. Present species and *M. chrysocephalus* originally considered conspecific; recovered as sister-taxa under certain coding schemes of morphological characters, and as a clade with very strong bootstrap support in all analyses of molecular data. Monotypic.

Distribution. Costa Rica (S from Volcán Miravalles, in Cordillera de Guanacaste) and W Panama (E to Veraguas).



Descriptive notes. 18-20 cm; 41 g. Has crown and nape dusky greyish-olive or dark sooty grey, finely streaked with black, paler and greyer towards forehead (sometimes mixed with dull whitish), large yellow coronal patch (semi-concealed); broad white supercilium, broad blackish stripe through lores and auriculars, whitish cheekstripe, dark greyish-olive or dusky malar streak; upperparts plain olive-green, rump and uppertail-coverts greenish-olive, tail-coverts with indistinct buffish-olive or cinnamon terminal margins; wings dusky greyish-brown, inner primaries and outer secondaries with narrow cinnamon edging, inner secondaries with broader whitish-yellow edging, greater wing-coverts with narrow cinnamon or cinnamon-buff margins, sometimes just terminal margins on middle coverts; tail deep greyish-brown, rather broad pale cinnamon or cinnamon-buff edges on inner webs of rectrices, sometimes also less distinct edging on outer webs; chin whitish, mostly deep lemon-yellow below, more canary-yellow on throat, some broad but faint olive lateral streaking on chest, less distinctive olive streaking on side of breast; axillaries and underwing-coverts bright yellow; iris brown; bill black or brownish-black, basal part of lower mandible more brownish, prominent rictal bristles; legs dusky. Differs from *M. chrysocephalus* mainly in greener upperparts, yellower underparts, and supercilium broader behind eye. Sexes alike. Juvenile is similar to adult, but lacks yellow coronal patch, is more brownish olive-green above, paler and slightly buffy below, also with cinnamon-rufous edging on both webs of remiges and broader margins on greater wing-coverts. VOICE. Most common call a harsh and wheezy, yet excited and high-pitched "syup", "seeeik", "skeé-eey" or skweey", and more complex "seek-a-skeeeir", "skeé-kit skeé-lit skeé-kit" or "chwit-chwit-ti-ti-tit-twit"; also melancholy "pee-ah" or "peeeir", similar to voice of *Myiozetetes similis*; repeated heavy chipping call when agitated. Dawn song said to be a clear and musical "tree-le-loo", repeated numerous times.

Habitat. Canopy and edges of wet montane cloudforest; especially common along watercourses and edges of forest clearings or treefall gaps. Mostly 700-1850 m on Caribbean slope, and to 2300 m on Pacific slope.

Food and Feeding. Fruits and insects. Usually seen in pairs throughout year; also in small family groups, especially during period of several months after breeding season. Sits on exposed perch, usually at middle to higher levels; makes short upward sallies to glean items from vegetation, hawks flying insects in air.

Breeding. Mar-May in Costa Rica. Nest a shallow and rather untidy but solid cup of fine rootlets and moss, often well camouflaged, placed 6-30 m above ground within nook or pocket of moss or in crevice formed by roots and clumping of epiphytes on high branch; also in old woodpecker (Picidae) hole, or in niche among ferns and other vegetation on vertical surface of bank or cliff. Clutch 3 eggs; no information on incubation and fledging periods.

Movements. Probably resident.

Status and Conservation. Not globally threatened. Restricted-range species: present in Costa Rica and Panama Highlands EBA. Uncommon to locally fairly common. In Panama, uncommon in valley of R Chiriquí Viejo around Nueva Suiza and Bambito, in W Chiriquí; more common farther E, in Fortuna region. Occurs in Rancho Naturalista and Tapantí National Park, in Costa Rica. Highland forests in its range have been extensively destroyed by burning, logging and agricultural conversion; 50% of Costa Rica's forests lost since 1940, and current deforestation rate of c. 3% makes it likely that in near future forests will remain only in protected areas. In Panama E of Chiriquí only fragments are left, and local extinction of forest-dependent species is considered likely.

Bibliography. Anon. (1998a), Birdsley (2002), Blake (1958), Cabanis (1861), Cory & Hellmayr (1927), Eisenmann (1955), Fogden (1993), Lanyon (1984a), McLellan (1938), Mobley (2002), Ridgely & Gwynne (1989), Ridgway (1907), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1972).

347. **Golden-crowned Flycatcher**

Myiodynastes chrysocephalus

French: Tyran à casque d'or **German**: Andenmaskentyrann **Spanish**: Bienteveo Coronidorado

Taxonomy. *Sc[aphorhynchus] chrysocephalus* Tschudi, 1844, Chanchamayo, Junín, Peru.

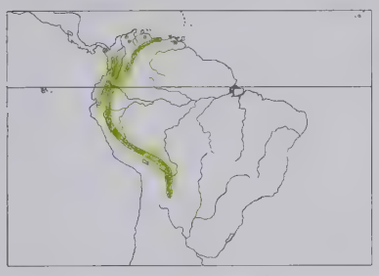
Affinities of genus uncertain; for long hypothesized as being closest to *Conopias*, largely on basis of similar hole-nesting tendencies. Genus probably monophyletic, although this only weakly supported by recent analyses of molecular-sequence data (likely due to inappropriate markers for the apparently long branches and deep level of divergence within genus). Results of separate analyses of plumage/syringeal morphology and molecular data were not completely congruent, but do suggest some strong tentative conclusions. Present species and *M. hemichrysus* originally considered conspecific; recovered as sister-taxa under certain coding schemes of morphological characters, and as a clade with very strong bootstrap support in all analyses of molecular data. Three subspecies currently recognized.

Subspecies and Distribution.

M. c. minor Taczanowski & Berlepsch, 1885 - E Panama (Cerro Tacarcuna and Cerro Pirre, in Darién), W & E Colombia (throughout Andes, also La Macarena Mts in S Meta) and Ecuador (S on W slope to Alamor area of W Loja).

M. c. cinerascens Todd, 1912 - N Colombia (Sierra Nevada de Santa Marta) through Sierra de Perijá to mountains of W & N Venezuela (Andes, and in C Falcón coastal mountains E to Sucre and N Monagas).

M. c. chrysocephalus (Tschudi, 1844) - Peru (C & E Andes from San Martín S to N Puno, also recorded in W cordillera in Bosque de Cuyas), W Bolivia (La Paz S to Chuquisaca and Tarija) and extreme NW Argentina (N Salta).



Descriptive notes. 19-22 cm; 37 g. Nominate race has brownish-grey or dusky crown, golden-yellow crown patch (semi-concealed), long and broad white supercilium; side of head greyish dusky, buffy white on lower cheek and into throat area, broad and somewhat blurred dusky malar streak; upperparts mostly dull olive; rump and uppertail-coverts greenish-olive, tail-coverts with buffy or cinnamon terminal margins; wings dusky, some rufous or tawny-buff edging on remiges and wing-coverts; tail dusky, some rufous edging on rectrices; chin white, becoming dull pale buffy on throat; mostly pale yellow below, especially lower underparts, chest more buffy yellow and clouded or flammulated with pale greyish-olive or olive, more prominent olive streaking on breast side; iris blackish; bill rather large and heavy, black, prominent rictal bristles; legs blackish. Distinguished from *M. hemichrysus* mainly by somewhat paler coloration, less contrasting head pattern. Sexes alike. Juvenile lacks coronal patch, has buffier supercilium, greyer upperparts, less streaked below. Race *cinerascens* is slightly smaller than nominate, has wider and more prominent cinnamon-rufous margins on wing and tail feathers, more buff on throat; *minor* is like previous, perhaps darker and more brownish-olive above. Voice. Typical song is short "tuiewee", "tuieweet" or "pieuee" repeated every 1-3 seconds. Common calls, usually from open or partially protected perch in canopy, often somewhat lower, are very loud, quite raucous and angry-sounding, persistently "squeeé-yu", "kiss-you", "skéézz-u", or squealing "skweé-ah"; voice has been likened to sound made by squeezing a rubber bath toy. Alarm call is sharp "kvuie" or "kvuie-kvuie". Dawn song a repeated "squeeé-yu-d'r'r'r".

Habitat. Humid or wet foothill and montane woodland or forest borders, moderately sized openings created by landslides or fallen trees within forest, larger clearings or higher-elevation pasture with scattered tall trees near forest; occasionally along roads, often along swift mountain streams. Mostly 900-2500 m, but up to 2800 m in Santa Marta and Perijá Mts, Andes and coastal ranges of N Venezuela; drops lower, down to 600 m in Venezuela, and to 400 m on Pacific slope in Colombia (Valle) and Ecuador.

Food and Feeding. Insects and fruits. Analysis of 25 prey items (mean length 10 mm) taken from stomachs in SE Peru gave: Coleoptera (68%); Homoptera (Pentatomidae 16%); and Hymenoptera (wasps 12%, ants 4%). Most often observed singly or in pairs; occasionally joins mixed-species flocks, usually for brief periods, but more often forages independently. Perches at various levels, usually lower to middle ones, on conspicuous and fully exposed limb; perches erect, but with slightly hunched posture, often nodding head. Hawks flying insects; hover-gleans or upward strikes for insects and fruits in canopy.

Breeding. Birds in breeding condition in May-Jul and eggs and fledglings in Aug in Colombia; eggs in Jan and Jun in Venezuela; fledglings in Jan, Jun, Jul and Sept in Ecuador; May in Peru. Nest not very well known, described as cup-shaped and usually composed primarily of moss; placed in variety of situations, most often in tree cavity or hole on vertical surface, sometimes on cliff ledge or in natural crevice or niche among rocky walls adjacent to roadcut. Clutch 2 eggs; no information on incubation and fledging periods.

Movements. Not well known, but some seasonal movement likely; in Venezuelan Andes said to be erratic and scarce in Jan-Mar, but especially vocal and conspicuous in Jun and Jul.

Status and Conservation. Not globally threatened. Uncommon to common. Range apparently expanding, and abundance probably increasing, as a consequence of road construction. Occurs in several protected areas, e.g. Henri Pittier National Park, in Venezuela, Tinigua National Park and Tambito Nature Reserve, in Colombia, Machu Picchu Historical Sanctuary, in Peru, and Madidi National Park and Pilón Lajas Biosphere Reserve, in Bolivia. Given the species' level of abundance and its tolerance of some forest degradation, it is considered unlikely to become threatened in near future.

Bibliography. Anon. (1998a), Begazo (1995), Birdsley (2002), Blake (1962), Chapman (1917c, 1921), Chebez (1994), Clements & Shany (2001), Cory & Hellmayr (1927), Delgado (1985), Ewert (1975), Fjeldså & Krabbe (1990), Flanagan & Vellinga (2000), Hilty (1997, 2003), Hilty & Brown (1986), Lanyon (1984a), Meyer de Schauensee (1982), Mobley (2002), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Stotz *et al.* (1996), Walker (2001), Wetmore (1939, 1972), Williams & Tobias (1994), Zimmer (1930).

348. Baird's Flycatcher

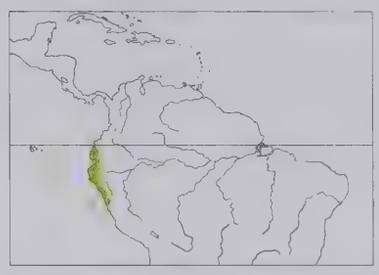
Myiodynastes bairdii

French: Tyran de Baird **German**: Pazifischer Maskentyrann **Spanish**: Bienteveo de Baird

Taxonomy. *S[aurophagus] bairdii* Gambel, 1847, California; error = Guayaquil, Ecuador.

Affinities of genus uncertain; for long hypothesized as being closest to *Conopias*, largely on basis of similar hole-nesting tendencies. Genus probably monophyletic, although this only weakly supported by recent analyses of molecular-sequence data (likely due to inappropriate markers for the apparently long branches and deep level of divergence within genus). Findings from separate analyses of plumage/syringeal morphology and molecular data were not completely congruent, but evidence indicates that present species is basal to two main clades, one containing *M. hemichrysus* and *M. chrysocephalus* and the other *M. luteiventris* and *M. maculatus*. Monotypic.

Distribution. SW Ecuador (C Manabí, from N side of Bahía de Caráquez, S to El Oro and W Loja) and NW Peru (S on Pacific slope to Ancash and to N Lima).



Descriptive notes. 23 cm. Has crown and nape sandy brown, crown lightly streaked grey, yellow coronal patch (semi-concealed); conspicuous broad black mask from forehead and through eye to ear-coverts, bordered above by sharply contrasting pale sandy-brown area; upperparts mostly olive-brown, becoming more rufous on rump; wings dusky, broad cinnamon-rufous margins on remiges and wing-coverts; tail mostly rufous, outermost rectrices with some dusky edging; throat whitish, rather obscurely streaked greyish; underparts largely pale creamy yellow, chest and breast area more pale ochraceous with somewhat indistinct greyish streaking; iris dark; bill rather heavy, mostly blackish, base of lower mandible pinkish; legs grey to blackish. Sexes alike. Juvenile undescribed. Voice. Not particularly vocal. Usual call, primarily at dawn (less often at dusk) from partially concealed perch, a hoarse-sounding "worr-sheéit worr-sheéit" or "wrrr-yeeít wrrr-yeeít", steadfastly repeated at intervals of 2-4 seconds and sometimes followed by ascending and more jumbled phrase.

Habitat. Arid lowlands, foothills and littoral areas with deciduous woodland or more arid scrub with some scattered tall trees, most common at borders; occasionally found in settled areas, especially in gardens. Mostly below 1000 m.

Food and Feeding. Larger insects; considerable quantities of fruit also consumed. Most often observed in pairs, perched conspicuously in the open at various heights, usually at higher levels; sometimes perches on telephone and other wires or on fences in human settlements. Insects taken by sally-gleaning to foliage, sometimes dropping to the ground in pursuit of prey.

Breeding. Eggs in Feb. Nest is a large, well-built cup of twigs with a neat lining of fine plant stems and roots, placed 10 m above ground in natural or man-made crevice or hole (e.g. under roof thatching or in electric light standards). Clutch 3-5 eggs; both sexes attend the young; no information on incubation or nestling periods.

Movements. Not well known, but likely resident throughout range.

Status and Conservation. Not globally threatened. Restricted-range species: present in Tumbesian Region EBA. Uncommon to fairly common. Especially numerous around Zapotillo (Loja), in Ecuador. Occurs in Cerro Blanco Forest Reserve, Machalilla National Park and Loma Alta Ecological Reserve, in Ecuador, and Northwest Peru Biosphere Reserve, in Peru. Forests within Tumbesian region are being rapidly destroyed, degraded and fragmented by deforestation and by understorey disturbance resulting from timber extraction and livestock grazing. In W Ecuador, forest below 900 m has disappeared at rate of 57% per decade from 1958 to 1988, and virtually all lowland forest outside protected areas likely soon to have been lost; at higher elevations deforestation has been slower, but overall still less than 5% of original forest cover remains, mostly on inaccessible slopes. Even protected areas suffer from logging, livestock grazing, illegal settling and habitat clearance by people with land rights.

Bibliography. Best & Clarke (1991), Birdsley (2002), Butler (1979), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Ewert (1975), Koepcke (1970), Lanyon (1984a), Marchant (1960), Meyer de Schauensee (1982), Mobley (2002), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), Stotz *et al.* (1996).

349. Sulphur-bellied Flycatcher

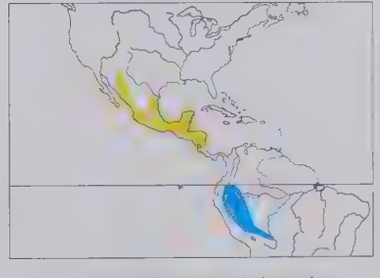
Myiodynastes luteiventris

French: Tyran tigré **Spanish**: Bienteveo Ventriazufrado
German: Nördlicher Fleckenmaskentyrann

Taxonomy. *Myiodynastes luteiventris* P. L. Sclater, 1859, Orizaba, Veracruz, Mexico.

Affinities of genus uncertain; for long hypothesized as being closest to *Conopias*, largely on basis of similar hole-nesting tendencies. Genus probably monophyletic, although this only weakly supported by recent analyses of molecular-sequence data (likely due to inappropriate markers for the apparently long branches and deep level of divergence within genus). Results of separate analyses of plumage/syringeal morphology and molecular data were not completely congruent, but evidence strongly suggests that present species is sister to *M. maculatus*, and that the two are sister-group to a clade consisting of *M. hemichrysus* and *M. chrysocephalus*. Specimens S from Guatemala evidently have heavier streaking on chest and throat and smaller bill than birds from Mexico, but differences deemed too inconstant to warrant subspecific separation. Monotypic.

Distribution. Breeds SW USA (mountains in S Arizona), Mexico (S on both slopes from Sonora, E Nuevo León and Tamaulipas), Guatemala and Belize S to Costa Rica. Winters E Ecuador, E Peru, extreme W Brazil (along R Juruá, in Acre) and Bolivia (S to Cochabamba and W Santa Cruz).



Descriptive notes. 19-22 cm; 45 g. Has greyish-olive crown, becoming more hoary grey or greyish-white on forehead, golden-yellow coronal patch (semi-concealed); whitish supercilium and cheekstripe contrasting sharply with thick black eyestripe, and with broad, dusky and heavily streaked to nearly solid malar stripe that continues across chin; upperparts largely light olive to brownish-grey, usually tinged buffy, and with broad but fairly indistinct dusky streaking; lower rump and uppertail-coverts cinnamon-rufous, streaked dusky; wings dark brown to blackish, yellowish-white or pale buff to primrose-yellow edging on, especially, inner secondaries and outer webs of median and greater wing-coverts, fairly broad pale greyish-olive or buffy-greyish edges on inner webs of medians, primary coverts and primaries, sometimes paler cinnamon margins on outer coverts; tail bright cinnamon-rufous with dusky shaft stripes, broadest on middle rectrices; chin and side of throat greyish or greyish-olive with broad dusky streaks, rest of throat whiter and with lighter streaking; underparts pale lemon-yellowish, broad dusky streaking on chest, narrower dusky streaking on flanks; axillaries and underwing-coverts lemon-yellow, axillaries with narrow dusky shaft streaks; iris brown; bill fairly stout, broad, dusky blackish, base of lower mandible pinkish or horn-coloured; legs blackish. Differs from *M. maculatus* in smaller bill with less pink at base, longer and broader dusky malar streak, less prominent and more whitish margins on wings, yellow lower underparts with no streaking on crissum. Sexes similar, possibly some minor differences (details unknown). Juvenile lacks

yellow coronal patch (but crown feathers said to have cinnamon-orange bases), has more extensive cinnamon-buff edgings on distal secondaries and wing-coverts, somewhat brighter upperparts with cinnamon-buff feather bases and margins, sometimes duller yellow underparts. Voice. Variety of high-pitched, forceful, quarrelsome-sounding and squeaky whistled phrases, including penetrating "toowí drrip", "wee-dee-yoo", "wee'iz-uh" or "weez-ih" (reminiscent of sound of child's plastic squeaky toy); also loud sharp call preceded by series of staccato notes, "p'p'p'peeee-ya", "kip-kip-kip squellya-squellya" or "pek, pek, pek kweez-i-zik kweez-i-zik", may be extended in longer series or shortened to high, penetrating "kee-zee'ick! kee-zee'ick!", even shorter but equally emphatic and squeaky "squeez-ya", "weel-yum", "pyeeeeuh", or forceful "seedeeyee"; softer and more melodious "tre-le-re-re", low nasal "kweeda kweeda" and hollow series of nasal "ket" notes rapidly climaxing in high-pitched loud squealing also given. Dawn song a bright, slightly slurred phrase followed by clipped, slightly liquid phrase, "chee-a-leet s-lik" or or "doo-ee ti-chu" or similar, continuously repeated, often for several minutes at a time. Migrants in South America usually rather quiet, but sometimes begin to give "squeez-ya" call in period prior to returning N.

Habitat. Canopy and edges of humid forest (both *terra firme* and *várzea* on wintering grounds) to semi-arid mixed or deciduous woodland in montane canyons with many sycamore (*Platanus*) and walnut (*Juglans*) trees; also along mountain streams, and in secondary and gallery woodland, plantations, and shrubby clearings with scattered tall trees. Generally between 1500 m and 1800 m in mountainous areas in N parts of breeding range, and from lowlands to 2000 m on Pacific slope but not below 600 m on Caribbean slope in Costa Rica; mostly below 1000 m in South American non-breeding range, but recorded to 2600 m on passage in Colombia.

Food and Feeding. Insects; also eats considerable quantities of berries and arillate seeds (e.g. of *Bursera* and *Trichilia*), especially on wintering grounds. Seen mostly singly or in pairs; usually in family groups after breeding season in Costa Rica. Usually perches high in canopy; generally inconspicuous unless vocalizing. Insects taken by aerial hawking from a high open perch, or by sally-gleaning among canopy foliage; berries and fruits often plucked in flight.

Breeding. Nests with eggs in Apr-Jun. Nest cup-shaped, composed primarily of small twigs, dry inflorescences and leaf petioles and rachises, often from walnut trees, lacks any significant lining; usually at middle to upper levels (3-27 m) inside natural tree cavity (hole created by branch rotting and falling close to bole) or in old hole of woodpecker (Picidae) or Resplendent Quetzal (*Pharomachrus mocinno*), often in tree within or at edge of clearing; female fills cavity with coarse twigs and leaves to near level of opening before constructing cup. Clutch 2-4 eggs; incubation by female, period c. 16 days; chicks fed by both parents, fledging period 16-18 days.

Movements. Migratory; winters in South America in W & SW Amazonia, from Ecuador S to Bolivia. Leaves breeding grounds mainly in Sept; present on wintering grounds mostly Oct-Apr, but some seem to remain until May and even into Jun; transient in Panama (primarily Sept-Oct and Mar-Apr) and Colombia (most records Oct, also Mar-Apr), with no evidence of overwintering. Present Mar-Sept in Mexico; in Costa Rica, breeding birds arrive Mar to early Apr, and migrants from N appear by early Aug and depart by mid-Oct. Casual in USA in S California, SW New Mexico and coast of W Texas.

Status and Conservation. Not globally threatened. Fairly common in most of breeding range. Fairly common in non-breeding range (e.g. in Peru). Occurs in several protected areas in both parts of range. Not dependent on intact forest, and able to survive in second growth, plantations and clearings; considered unlikely to be at any risk.

Bibliography. Baicich & Harrison (1997), Bendire (1895), Bent (1942), Binford (1989), Birdsley (2002), Brandt (1951), Contreras (1997), Cory & Hellmayr (1927), DeGraaf & Rappole (1995), Fjeldså & Krabbe (1990), Fitzpatrick (1980a), Brodkorb (1943), Gómez & Aguilar (1998), Henshaw (1875), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Kaufman (1996), Land (1970), Lanyon (1984a), Lee Jones (2004), Ligon (1971), Lowther & Stotz (1999), Meyer de Schauensee (1982), Mobley (2002), Monroe (1968), Paynter (1995), Pearson (1980), Price *et al.* (1995), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson (1997), Rowley (1966, 1984), Schaldach (1963), Sibley (2000), Skutch (1960), Slud (1964, 1980), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Udvardy (1963), Wetmore (1972), Willis (1980), Zimmer (1930).

350. Streaked Flycatcher

Myiodynastes maculatus

French: Tyran audacieux **German**: Südlicher Fleckenmaskentyrann **Spanish**: Bienteveo Rayado

Taxonomy. *Muscicapa maculata* Statius Muller, 1776, French Guiana.

Affinities of genus uncertain; for long hypothesized as being closest to *Conopias*, largely on basis of similar hole-nesting tendencies. Genus probably monophyletic, although this only weakly supported by recent analyses of molecular-sequence data (likely due to inappropriate markers for the apparently long branches and deep level of divergence within genus). Results of separate analyses of plumage/syringeal morphology and molecular data were not completely congruent, but evidence strongly suggests that present species is sister to *M. luteiventris*, and that the two are sister-group to a clade consisting of *M. hemichrysus* and *M. chrysocephalus*. Has been suggested that race *solitarius* may represent a separate species, on basis largely of differences in plumage, but apparent intermediate forms from N Brazil (S Amazonas) and general similarity in voice to other races argue against this. Otherwise, clearly observable differences between supposed races from localities as widely separated as N Venezuela, the Guianas and NE & S Brazil are lacking; close re-evaluation and probably revision required. Seven subspecies currently recognized.

Subspecies and Distribution.

M. m. insolens Ridgway, 1887 - breeds E & SE Mexico (SW Tamaulipas S to Puebla, N Oaxaca and N Chiapas, E to S Yucatán and Quintana Roo), N Guatemala, Belize and NW Honduras; migrates S to N South America.

M. m. difficilis J. T. Zimmer, 1937 - W Costa Rica S to Panama (including Coiba I and Cébaco), Colombia (except N & W) and W Venezuela (W of Andes in Zulia and Táchira, W Falcón E to Curimagua, and E base of Andes S from Portuguesa).

M. m. nobilis P. L. Sclater, 1859 - N Colombia (Córdoba E in coast region to Sierra Nevada de Santa Marta and W side of Sierra de Perijá).

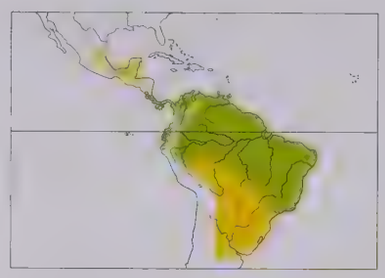
M. m. tobagensis J. T. Zimmer, 1937 - Venezuela (except W, but including Margarita I), Trinidad and Tobago, and Guyana.

M. m. chapmani J. T. Zimmer, 1937 W Colombia (S from Serranía de Baudó in Chocó, absent or local in SW lowlands), W Ecuador and extreme NW Peru (S to Piura, also recorded Arequipa).

M. m. maculatus (Statius Muller, 1776) - Surinam, French Guiana, N Brazil (upper R Negro S to S bank of R Amazon, E to NW Maranhão) and E Peru (R Napo and R Ucayali area).

M. m. solitarius (Vieillot, 1819) - breeds C & S Peru and C & E Brazil S to E Bolivia, Paraguay, Argentina (S to San Luis, La Rioja, Córdoba, La Pampa and N Buenos Aires) and Uruguay; S populations migrate N.

Descriptive notes. 19·5-23 cm; 43-45 g. Nominate race has buffy to cinnamon crown heavily but indistinctly streaked dusky, semi-concealed bright yellow (sometimes tinged orange-rufous) coronal



patch; pale buff- yellowish to dull yellowish-white forehead and supercilium (with narrow dusky streaking) and pale yellowish to dull buff-whitish lower cheek contrasting with broad blackish or dusky (sometimes tinged browner) eyestripe through lores and auriculars; malar region whitish, more pale buffy anteriorly and brown posteriorly, prominently streaked dusky; upperparts more or less light brown, usually prominently suffused with cinnamon-brown or buffy brown, with bold black or dusky streaks, back, scapulars and upper rump more light greyish-brown or olive and conspicuously streaked dusky, lower rump and uppertail-coverts mostly cinnamon-rufous with narrow dusky shaft streaks; wings dusky, primaries and secondaries with cinnamon-rufous margins, tertials with broad pale yellowish-buff or buff-white edges, lesser and median wing-coverts with broad light cinnamon-rufous margins, greater coverts broadly edged more cinnamon-buff; tail cinnamon-rufous with dusky stripe along rachis, broadest on innermost feather pair and gradually expanding terminally; more or less dull whitish below, well suffused with pale sulphur-yellow (especially on breast, side and undertail-coverts), chin and throat side narrowly streaked dusky, prominent dusky streaks on breast, sides, flanks and crissum, streaks broadest on chest and anterior part of side; iris brown; upper mandible deep brownish (darkest terminally), lower mandible slightly duller brownish (more dusky terminally and along tomium) and with extensive pinkish towards base; legs dark greyish. Differs from similar *M. luteiventris* mainly in larger and heavier bill with more extensive pinkish at base, yellower supercilium, less obvious malar streak, rufous (not whitish) wing edgings, paler yellow on underparts. Sexes alike. Juvenile is similar to adult, but crown more rufous and lacking yellow coronal patch, has more extensive rufous edging on wings, less yellow suffusion on underparts. Races somewhat variable, and some apparently inseparable from others: *insolens* is paler and more olivaceous above than nominate, with narrower streaking above, more yellowish supercilium, narrower and paler margins on remiges, much narrower and less extensive streaking below (crissum almost unstreaked), perhaps longer wings and shorter tail and bill; *nobilis* is generally paler and more buffy above than nominate, with greater yellowish suffusion and less heavy streaking below; *solitarius* is most distinctive, with blacker and more prominent streaking overall, mostly whitish wing margins, predominantly blackish tail with very narrow rufous edgings on rectrices; other races are variable. Voice. Variety of rather loud and raucous calls, most commonly a harsh and sharp nasal "chup", "eéchup", "behk", "kik", "chek" or "pehk" that is sometimes steadily repeated; also slightly liquid and sometimes excitedly repeated "w-see'u", "chuk-yi", "tsu ka" or "t-cheu", and harsh chattering "chi w-chi ki-chi w-chi ki-chi". Dawn song (also given at dusk in many regions) quite melodious, a loud and quickly repeated "wheeé-cheederee-wheeé", sometimes lacking last note; in Costa Rica and Panama described as persistently repeated, soft, clear, liquid and unexpectedly melodious "kawee-teedly-wink", "whee-cheerily-chee" or "whee´-cheederee-che´", in Colombia as squeaky and slightly musical "wheet-siddle-whít", and in Venezuela as quick, rhythmic "wéét, wiggle-your-feet!" given repeatedly without pausing; in Brazil, a song given at dusk described as resonant and descending "dlui-dluee-gwik", repeated.

Habitat. Evergreen to semi-deciduous forest, open second-growth woodland and gallery forest, edges and moderate clearings with sufficient scattered tall trees, sometimes in trees around houses and agricultural areas, mangroves, and *caatinga*; also in younger and more open *várzea* and river islands in Amazonia, seeming to eschew more humid or well-forested areas. Mostly below 1500 m, but to 1650 m in Panama (W Chiriquí), 2000 m in Venezuela, and 3000 m in C Colombian Andes (Puracé).

Food and Feeding. Insects, including especially cicadas (Cicadidae), wasps and flying ants (Hymenoptera); small lizards and considerable quantities of small berries and arillate fruits also consumed, especially by austral migrants. Usually solitary or in pairs, but sometimes in loose flocks during migration; occasionally joins mixed-species foraging flocks. Often rather noisy and thus quite conspicuous, but sometimes perches silently for prolonged periods. Perches at all heights, but usually at middle levels or higher. Most often makes short sallies and hover-gleans among thick canopy foliage and from branches; also aerial hawks flying insects from high exposed perch.

Breeding. March-May in Costa Rica; in Colombia, birds in breeding condition Mar-Jun and juveniles by Jul in N, and in breeding condition Jan in SW (Huila); breeding Mar-Apr in N Venezuela and Mar-Jul in Trinidad and Tobago; Nov-Jan in Argentina. Nest, built by female, a shallow cup (two in Argentina 8-9 cm in diameter, 8 cm tall, 3-5 cm deep) composed of dry compound leaf petioles and rachises and flower stalks, lined with finer leaf rachises, usually placed at middle to upper levels (5·5-23 m) in natural cavity or large woodpecker (Picidae) or quetzal (*Pharomachrus*) hole (entrance of one in Argentina 13 × 11 cm) in dead or decaying tree at forest edge or within clearing, sometimes on ledge under eaves of house, in nestbox, or in crevice among bases of palm fronds or niche among vine tangles; old nest of Rufous Hornero (*Furnarius rufus*) sometimes used in Argentina; when cavity or crevice is deep, female often raises level of nest foundation by filling recess with coarse materials; often perches conspicuously near nest, as if on guard. Clutch 2-3 eggs, sometimes 4; incubation by female, period 16-17 days; nestlings fed by both parents, fledging period 17-21 days. Nests sometimes parasitized by Shiny Cowbird (*Molothrus bonariensis*).

Movements. Migratory in N & S of range. N breeders present late Mar to Sept on Atlantic slope from Mexico S to W Honduras, winter S to Panama and N South America; in Costa Rica, S migration occurs late Jul to early Sept and N passage Feb-Mar; migrants recorded in Panama Feb-Apr, but presumably also present in autumn (probably Sept-Oct). Those breeding from S Peru and C & SE Brazil S to Boliva and C Argentina (race *solitarius*) migrate N, spending non-breeding period (mostly Apr-Sept) E of Andes N to E Colombia and N South America, with single records from N Chile (Atacama) and SW Peru (Arequipa); migrants occur primarily May-Jul and Dec in Colombia, recorded Mar-Sept in Venezuela (mainly S of R Orinoco), and present Apr-Aug in Ecuador. In addition, some local elevational movement by resident races apparent in Venezuela.

Status and Conservation. Not globally threatened. Uncommon to locally common. Has very large range, within which it occurs in numerous national parks and other protected areas. Adaptable; found in many types of wooded habitat, and not dependent on intact forest; survives well in degraded habitats and tolerant of human presence.

Bibliography. Anon. (1998a), Babarskas *et al.* (2003), Barrows (1883), Binford (1989), Birdsley (2002), Bond *et al.* (1989), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Clements & Shany (2001), Contreras (1988), Cory & Hellmayr (1927), Di Giacomo (2004), ffrench (1991), Fitzpatrick (1980a, 1985a), Fjeldså & Maijer (1996), Friedmann (1927), Friedmann & Smith (1950), Guix (1995), Haffer (1975), Hartert & Venturi (1909), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Johnson (1967), Joseph (1996), Klimaitis & Moschione (1987), Lanyon (1984a), Lee Jones (2004), Lowen *et al.* (1996), Machado & Rodrigues (2000), Miller (1947), Miserendino (1998), Mobley (2002), Moermond & Denslow (1985), Monroe (1968), Narosky & Salvador (1998), Olson (1997), Oren & Parker (1997), de la Peña (1988, 1999), Pereyra (1937), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson (1997), Robinson & Terborgh (1997), do Rosário (1996), Schönwetter & Meise (1968), Short (1975), Sibley & Ahlquist (1985c), Sick (1993, 1997), Skutch (1960, 1985),

Slud (1964), Stiles & Skutch (1989), Stotz *et al.* (1996), Terborgh *et al.* (1984), Thomas (1979a), Tostain *et al.* (1992), Tubelis (2000), Wetmore (1972), Willis (1980), Wright *et al.* (1985), Zimmer (1930, 1937c).

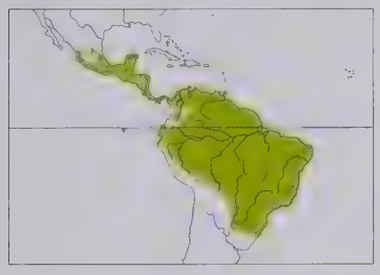
Genus *MEGARYNCHUS* Thunberg, 1824

351. **Boat-billed Flycatcher**

Megarynchus pitangua

French: Tyran pitangua **German**: Starkschnabel-Maskentyrann **Spanish**: Bienteveo Pitanguá

Taxonomy. [*Lanius*] *Pitangva* [*sic*] Linnaeus, 1766, Rio de Janeiro, Brazil.
Affinities of genus uncertain. Syringeal morphology, nest architecture and molecular-sequence data indicate a sister relationship with *Tyrannopsis*; molecular data provide conflicting but fairly weak evidence for the two being either the sister-group to *Conopias*, or basal to a group including *Conopias* as sister to a well-supported clade containing *Empidonomus*, *Griseotyrannus* and *Tyrannus*, but additional sequence data necessary in order to resolve true affinities among these taxa. Trinidad birds described as race *parvirostris* on grounds of supposedly smaller bill, but considered otherwise indistinguishable from South American birds. Some races seem readily distinguishable, others less so; populations of nominate from S Brazil and Paraguay appear somewhat larger and darker on average than those in N, but much individual variation; critical re-evaluation of races is needed. Six subspecies currently recognized.
Subspecies and Distribution.
M. p. tardiusculus R. T. Moore, 1941 - W Mexico (SW Sinaloa, W of main Sierra Madre, S to W Nayarit).
M. p. caniceps Ridgway, 1906 - W Mexico (SW Jalisco).
M. p. mexicanus (Lafresnaye, 1851) - E & S Mexico (from S Tamaulipas in E, from Guerrero in W) S to Panama and NW Colombia (NW Chocó S to R Juradó).
M. p. deserticola Griscom, 1930 - arid valley of R Negro, in C Guatemala.
M. p. pitangua (Linnaeus, 1766) - N, C & E Colombia (Caribbean lowlands, Magdalena Valley S to Huila, and throughout E of Andes), Venezuela, Trinidad, the Guianas, E Ecuador (except Zamora area), E Peru, Brazil (S to Rio Grande do Sul), N & E Bolivia, Paraguay and NE Argentina (S to E Formosa and Corrientes).
M. p. chrysogaster P. L. Sclater, 1860 - W Ecuador (S from W Esmeraldas) and extreme NW Peru (Tumbes, N Piura), possibly crossing Andes into S Ecuador.



Descriptive notes. 21-5-24 cm; 62-70 g. Nominate race has blackish-brown or dull sooty-black crown, yellow to orange-rufous coronal patch (semi-concealed); long, broad and conpicuously contrasting white supercilia extending to side of forehead meeting (or nearly so) on nape; broad black band from lores to auriculars dull slate-black, white malar region; upperparts mostly olive to dull brownish-olive; wings dusky brownish, rather inconspicuous narrow pale cinnamon or rufous edgings (sometimes lacking); tail rather short, dusky brownish with narrow pale cinnamon or rufous edgings; throat white; underparts, including axillaries and underwing-coverts, bright yellow; iris brown; bill exceptionally broad and heavy, rather long with a strongly arched culmen, blackish, base of lower mandible sometimes more brownish; legs blackish. Distinguished from superficially similar *Pitangus sulphuratus* and *Myiozetetes similis* by large size, brownish wings and tail, more olivaceous upperparts, unusually stout and exceptionally broad bill. Sexes alike. Juvenile is similar to adult, but lacks coronal patch, has broader cinnamon or rufous edgings on wing (more whitish on inner secondaries) and tail, supercilium tinged yellow, also generally darker and more brownish above with cinnamon to dull rufous feather edges. Races vary mainly in plumage tones and prominence of edgings: *mexicanus* has brighter or more greenish-olive upperparts than nominate, no rufous margins on rectrices, and in NW Colombia said to have coronal patch tawny-orange; *caniceps* differs from previous in more greyish crown, more greyish-olive upperparts; *tardiusculus* and *deserticola* are similar to previous two; *chrysogaster* is similar to nominate, but has more prominent rufous margins on remiges and upperwing-coverts, slightly richer yellow underparts, and coronal patch supposedly always tawny-orange (not yellow or orange-yellow). Voice. Common calls, sometimes accompanied by head-bobbing, varied, loud, rather harsh and slightly squealing, readily noticeable, include gruff and often rattling, stuttering or quavering "kwée'le", "eeihrrr", "krrrah", "neeeeeah" or "keerrrrr-eék", gruff and quarrelsome "quee-zika quee-zika" or "eehr, eehr ki-di-rrik" and similar, nasal whiny "er-er-er-erk", nasal and mocking "nya-nya-nya-nya", and rapidly repeated loud "choip choip"; race *chrysogaster* (W of Andes) said to give fast "kreh-kreh-kreh-kreh-kreh-kreeeenh" and series of "kirrr-wick" calls, different from strident nasal "kryeeeh-nyeh-nyeh-nyeh" of nominate (E of Andes); also louder and more insistent squealing "squée'lee'lee" and "squ'é'é'le'le'le" in disputes. Dawn song loud but simple and clear, slightly reedy and rolled "whée-dic", "pprrri-iu", "chirr-rr" or "cheer chirree", monotonously repeated (once per second), as well as shorter "prriu" or "cheer" punctuated by slurred "bo-oy" or "chrr-ee".
Habitat. Variety of woodland and forest habitats, from humid to arid and deciduous, but most often observed in semi-open areas, savanna and clearings with scattered tall trees, plantations, or edges of more densely covered areas, and drier riparian woodland; in Amazonia usually associated with *várzea* canopy and margins of rivers and lakes, but not exclusively close to water; also shady gardens and tall second growth. Mostly below 1000-1500 m, but often observed to 1850 m (rarely, to 2000 m) in Costa Rica and Panama, and recorded to 1900 m in Venezuela and Ecuador (E Loja).
Food and Feeding. Invertebrates, especially cicadas (Cicadidae) and other very large insects; also known to consume small vertebrates, and figs (*Ficus*), berries and arillate seeds. Usually observed in pairs or small family groups of 3-5 individuals; occasionally joins mixed flocks moving through canopy. Generally at middle to higher levels and often amid dense canopy foliage, but also readily perches conspicuously in the open, on top or at sides of larger trees; sometimes at lower levels, especially on interior branches of more open trees such as *Cecropia*. Scans from perch; sally-gleans prey usually at short distances, from surface of foliage, sometimes hovering briefly, but often striking explosively against leaf; often hammers larger items against perch prior to consumption; rarely, hawks flying insects; fruits and seeds taken by sally-gleaning or perch-gleaning.
Breeding. Feb-Jun in Trinidad; in Colombia, nest-building in Jul and Oct, incubation in Aug in extreme SW (Leticia), males in breeding condition Jun-Aug in N (Guajira, César) and once in Jan in S (Huila); nesting in late Nov in S Brazil, nest-building in Jul in Amazonas; mid-Oct to late Dec (nestlings late Dec) in Argentina (Misiones). Nest, completed in c. 10-14 days, a more or less round and rather shallow cup, composed of variety of materials including twigs, leaves, grass, dry vines, roots, rhizomes of epiphytes, and other fibrous materials, sometimes appearing rather frail and loosely constructed; usually placed at fork of horizontal tree branch c. 6-30 m up, at variable distance (up to 7 m) from trunk. Clutch 2-3 eggs, laid at intervals of 2-3 day; incubation period 17-18 days; nestling period c. 24 days.
Movements. Not very well understood. Some populations of nominate race in S Brazil and NE Argentina considered migratory; also known to wander broadly and appears to undergo some elevational shifts, descending from higher altitudes following breeding season.
Status and Conservation. Not globally threatened. Uncommon to common. Occurs in numerous national parks and other protected areas throughout its very large range. Adaptable: found in wide variety of wooded habitats, and exhibits tolerance of degraded habitats. Not likely to become threatened.
Bibliography. Anon. (1998a), Belton (1985), Binford (1989), Birdsley (2002), Brooks *et al.* (1993), Canevari *et al.* (1991), Cherrie (1916), Cintra (1997), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Di Giacomo (2004), Euler (1900), ffrench (1991), Fitzpatrick (1985a), Griscom (1930), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995, 1998), Hayes & Samad (2002), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Ihering (1900), Lanyon (1984a), Lee Jones (2004), Lowen *et al.* (1996), Meyer de Schauensee (1966, 1982), Miller (1947), Miserendino (1998), Mobley (2002), Moermond & Denslow (1985), Monroe (1968), Narosky & Salvador (1998), Oniki & Willis (1983b), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson (1997), Robinson & Terborgh (1997), do Rosário (1996), Rowley (1984), Schönwetter & Meise (1968), Short (1975), Sibley & Ahlquist (1985c), Sick (1993, 1997), Skutch (1951, 1960, 1985), Slud (1964), Stiles & Skutch (1989), Stotz *et al.* (1996), Temple (2002), Terborgh *et al.* (1984), Tostain *et al.* (1992), Traylor & Fitzpatrick (1982), Wetmore (1972), Williams & Tobias (1994), Willis (1980, 1988).

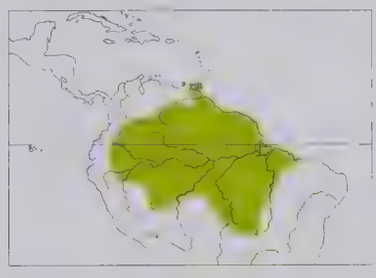
Genus *TYRANNOPSIS* Ridgway, 1905

352. **Sulphury Flycatcher**

Tyrannopsis sulphurea

French: Tyran des palmiers **German**: Schwefeltyrann **Spanish**: Tirano Palmero

Taxonomy. *Muscicapa sulphurea* Spix, 1825, Manaus, Rio Negro, Brazil.
Long considered closely related to *Myiozetetes* on grounds of plumage. More recent evidence relating primarily to syringeal morphology, nest architecture and molecular-sequence data indicates close affinity with, instead, *Megarynchus*; molecular data also provide conflicting but fairly weak evidence for the two being either the sister-group to *Conopias*, or basal to a group including *Conopias* as sister to a well-supported clade containing *Empidonomus*, *Griseotyrannus* and *Tyrannus*, but additional sequence data necessary in order to resolve true affinities among these taxa. Monotypic.
Distribution. E Colombia (S from Meta and Vaupés), E & S Venezuela (SE Sucre S to Delta Amacuro, Bolívar and Amazonas), Trinidad and the Guianas S to E Ecuador (primarily R Napo and R Aguarico, but certainly more widespread), E Peru (Loreto, Ucayali, recorded also Madre de Dios), extreme NW Bolivia (Pando area), and Amazonian Brazil (E to Maranhão, S to Rondônia, S Mato Grosso, Goiás and Tocantins).



Descriptive notes. 19-20·3 cm; 54 g. Has head mostly dusky grey, orange-yellow coronal patch (semi-concealed), darker grey on side of head, indistinct whitish supercilium, more blackish mask through eye; upperparts dull olive-brown; wings plain dark brownish dusky, more brownish and darker than back; tail rather short, blunt, brownish-olive, darker than back; throat whitish, blurry dark grey streaking at side; upper chest white, rest of underparts bright yellow, side of breast and flanks with olivaceous tinge, chest side rather obscurely streaked and washed with grey; iris dark; bill rather short and stubby, black; legs black. Distinguished from *Tyrannus melancholicus* mainly by smaller size, duller overall plumage with much browner upperparts, white throat contrasting with yellow breast and belly, blunter (not notched) and proportionately shorter tail; from somewhat similar *Myiozetetes luteiventris* also by larger size, larger bill, more olive tinge above, less prominent olivaceous flammulation across breast. Sexes alike. Juvenile undescribed. Voice. Often rather noisy and excitable, especially early and late in day (but can remain silent for long periods, occasionally interrupted by energetic bursts of vocalization). Calls variable, commonly an electrified screeching "shréééééééé, shr-shréééééééé" or "squeezrr-squeezr-squeezrr-prr", partners often counter-calling rapidly; song a similar-sounding loud, sharp, harsh, high pitched "jweez", "jweez-z jweez", "jee-peet", "jee-peeteet, jeepeet", "ks, ks, ks, ks-ksi-gay" or "shr'dek, shr'r'r'e'k, shr'dek'dek" with characteristic sputtering quality, has been likened to "pulses of electric energy".
Habitat. Borders of humid forest, savannas, pastures and agricultural areas, also in towns where groves of moriche or buriti palms (*Mauritia*) present; sometimes regarded as a moriche specialist, but not exclusively associated with palm trees. To c. 400 m.
Food and Feeding. Insects; also some fruit, and observed to eat *Virola* arils. Usually solitary, often in pairs, sometimes in small family groups. Perches stolidly and conspicuously in the open at various heights, usually higher up and on tops of trees and bushes. Hawks flying insects, often sallying long distances in pursuit of prey, much like *Tyrannus*; takes fruit by hover-gleaning, often flying long distances to fruiting trees.
Breeding. Apr in Trinidad; birds in breeding condition in Feb and Apr in Colombia (NE Meta). Nest round and cup-shaped, rather frail, loosely composed of sticks, usually placed at base of fronds in crown of palm. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Not well known; generally regarded as resident, with no apparent indication of migratory movements.
Status and Conservation. Not globally threatened. Rare to uncommon and local. Occurs in Tinigua National Park, in Colombia, Alto Orinoco-Casiquiare Biosphere Reserve, in Venezuela, Jatun Sacha Biological Reserve, in Ecuador, Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, Noel Kempff Mercado National Park, in Bolivia, and Jaú National Park and EMBRAPA Experimental Station, in Brazil. Given its large range and tolerance of

converted and disturbed habitats, this species is thought unlikely to become threatened in near future. Extent to which it is dependent on palms requires further study.

Bibliography. Allen (1995), Bates & Parker (1998), Birdsley (2002), Boesman (1998), Chapman (1894), Clements & Shany (2001), Cory & Hellmayr (1927), Dubs (1992), ffrench (1991), Friedmann (1948), Gilliard (1941), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1998), Herklots (1961), Hilty (2003), Hilty & Brown (1986), Lanyon (1984a), Meyer de Schauensee (1982), Mobley (2002), Parker & Remsen (1987), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1905), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Temple (2002), Tostain *et al.* (1992), Walther (2004).

Genus *EMPIDONOMUS* Cabanis & Heine, 1859

353. **Variegated Flycatcher**

Empidonomus varius

French: Tyran tacheté **German**: Schuppenrücken-Maskentyrann **Spanish**: Tuquito Rayado

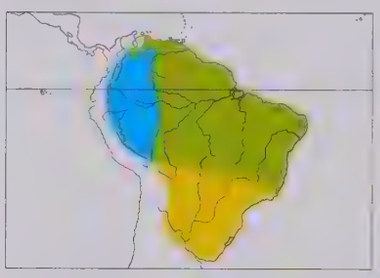
Taxonomy. *Muscicapa varia* Vieillot, 1818, Paraguay.

Despite significant differences in plumage, a close but equivocal relationship between present genus, *Griseotyrannus* and *Tyrannus* has been suggested on basis of their shared possession of conspicuous notching on inner webs of outer primaries (an unusual trait, found in only seven or eight distantly related genera in other tyrannid subfamilies); that these three form a monophyletic group was strongly supported in recent analyses of molecular-sequence data. Races differ in migratory behaviour, possibly represent two separate species; further study required. Birds taken from N Venezuela (Carabobo) and E Colombia described as race *septentrionalis*; said to be darker above with heavier streaking below, but indistinguishable from nominate, and presumably relating to migrants from S. Two subspecies currently recognized.

Subspecies and Distribution.

E. v. rufinus (Spix, 1825) - Venezuela (E base of Andes in Portuguesa and Barinas, E Falcón and N cordilleras E to Sucre and Delta Amacuro, also throughout Bolívar and Amazonas), the Guianas and N & E Brazil (E to Pará and SE to Bahia, S along R Madeira to near border with Bolivia).

E. v. varius (Vieillot, 1818) - breeds C & E Bolivia, C & S Brazil (Mato Grosso E to Espírito Santo, S to Rio Grande do Sul), N Argentina (S at least to Tucumán, Santa Fe and Entre Ríos, possibly farther S), Paraguay and Uruguay; S breeders migrate N into range of nominate and NW as far as W Colombia.



Descriptive notes. 18-19 cm; 25 g. Nominate race has mostly blackish or blackish-brown head, yellow coronal patch (semi-concealed), long white supercilia nearly confluent on nape, broad dusky eyestripe, whitish cheekband, conspicuous brownish or dusky malar streak; upperparts largely dusky or dark brownish with decidedly pale whitish streaking, giving somewhat mottled appearance, rump more dark brown with conspicuous rufous margins, uppertail-coverts rufous; wings dusky, prominent white edgings on remiges and wing-coverts; tail rather long, dark brown or blackish, prominent rufous edges; mostly yellowish-white with profuse dusky brown streaking below, throat area more dingy whitish, breast and sides clouded and with streaks rather distinct; iris dark; bill blackish, pale pinkish area at base of lower mandible; legs black. Distinguished from similar *Legatus leucophaius* by longer and proportionately broader bill with pale area at base of lower mandible, paler upperparts with fainter streaking, more conspicuous white edgings on remiges and wing-coverts, rufous edging on rump and tail feathers. Sexes alike. Juvenile is similar to adult, but lacks yellow coronal patch, no streaking on underparts. Race *rufinus* is smaller than nominate, with proportionately smaller bill, wing and tail, paler-looking (brownish, rather than blackish) above, feather margins lighter olivaceous, also with more restricted and less bold streaking below. Voice. Usually rather quiet, even during breeding; harsh "chee-chee-chu" call, final note more prolonged, also a weak (nearly inaudible) high-pitched, thin and nasal "pseee", "zureee" or "zreeetee", usually at rather irregular intervals and sometimes in series; in Brazil voice has been described as high whistled "tsri, si, si, si".

Habitat. Borders of primary forest, secondary woodland, gallery forest, open savanna with scattered bushes and trees, sizable forest clearings, sometimes parks; may also occur in small numbers in *terra firme* forest canopy, but likely only on passage. Mostly below 1200 m, but in Venezuela to 1900 m N of R Orinoco; one record at 3950 m in NC Peru (Ancash).

Food and Feeding. Insects; also small fruits, austral migrants possibly consuming greater quantities of fruit than do residents. Generally solitary; occasionally joins mixed-species flocks, but usually forages independently. Stays rather low or at middle levels on conspicuous exposed perch on small bush or at outer edges of trees, occasionally on top of taller trees; rather erratic and enigmatic in occurrence, with no clear domain, and often observed in unexpected situations. Hawks flying insects, and sallies to hover-glean items from foliage.

Breeding. Nest-building activity recorded as early as mid-Oct (Santo Tomé), eggs late Nov to Dec and nestlings mid-Dec in Argentina. Nest usually like a flattened sphere, composed primarily of smaller twigs and leaf stems, lined with rootlets and leaf ribs, external diameter c. 15 cm, height 7 cm, internal diameter 6 cm, egg-chamber depth 2 cm, weight of one nest 40 g; usually placed c. 1-8 m up in fork of horizontal tree branch. Clutch 2-3 eggs; no information on incubation and fledging periods. Nests sometimes parasitized by Shiny Cowbird (*Molothrus bonariensis*).

Movements. S race (nominate) partially migratory, vacates breeding areas S of E Bolivia and S Brazil. Migrates N primarily into W Amazonia, Venezuela, Trinidad, the Guianas, and intermediate areas in Bolivia and C & N Brazil; austral migrants present throughout much of Colombia (E of Andes) and lowlands of E Ecuador from Mar to Aug, sometimes into late Sept, and in Venezuela mid-Mar to mid-Sept (one record of probable straggler in Táchira in late Oct). S limit of migrant populations not clear; older records exist from La Pampa, La Rioja and San Luis, in Argentina, but these may represent vagrants. Several cases of extreme overshoots in E USA and SE Canada also recorded.

Status and Conservation. Not globally threatened. Uncommon to fairly common. Occurs in many national parks and other protected areas. Has a large range and is found in a variety of wooded habitats; tolerant of converted and disturbed habitats. Considered unlikely to be at any risk in the near future.

Bibliography. Anon. (1998a), Barrows (1883), Birdsley (2002), Brooks *et al.* (1993), Cabanis & Heine (1859-1860), Canevari *et al.* (1991), Chesser (1997), Cintra (1997), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Contino (1980), Cory & Hellmayr (1927), Di Giacomo (2004), Dubs (1992), Fjeldså & Krabbe (1990), ffrench (1991), Fitzpatrick (1980c), Friedmann (1927, 1948), Hartert & Venturi (1909), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Ihering (1900), Joseph (1996), Lanyon (1984a), Lowen *et al.* (1996), Meise (1949), Meyer de Schauensee (1966, 1982), Mobley (2002), Narosky & Salvador (1998), Naumburg (1930), Oniki & Willis (1983b), Oren & Parker (1997), de la Peña (1987, 1988), Pinto (1953), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), do Rosário (1996), Schönwetter & Meise (1968), Short (1975), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Tubelis (2000), Walther (2004), Wetmore (1926), Zimmer (1937b).

Genus *GRISEOTYRANNUS* W. E. Lanyon, 1984

354. **Crowned Slaty Flycatcher**

Griseotyrannus aurantioatrocristatus

French: Tyran oriflamme **German**: Grau-Maskentyrann **Spanish**: Tuquito Gris

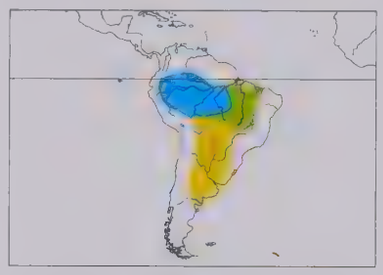
Taxonomy. *T[yrannus] aurantio-atro cristatus* [*sic*] d'Orbigny and Lafresnaye, 1837, Valle Grande, Santa Cruz, Bolivia.

Despite its very different plumage, was for long placed in genus *Empidonomus* owing to similarities in voice and behaviour; later accorded a monotypic genus based primarily on several apparently uniquely derived differences in syringeal morphology. Molecular-sequence data indicate strong support for *Empidonomus varius* as its closest relative, the two genera constituting a monophyletic group with *Tyrannus*. Two subspecies recognized.

Subspecies and Distribution.

G. a. pallidiventris (Hellmayr, 1929) - EC Brazil (E Pará E to Maranhão and Piauí, S to N Goiás).

G. a. aurantioatrocristatus (d'Orbigny & Lafresnaye, 1837) - breeds N & E Bolivia (S from Beni), WC & S Brazil (S Mato Grosso E to W Minas Gerais, S to Mato Grosso do Sul, extreme W Paraná, Santa Catarina and W Rio Grande do Sul), N & C Argentina (S to Mendoza, La Pampa, N Río Negro and Buenos Aires), Paraguay (especially W of R Paraguay) and Uruguay; migrates N to W Amazonia.



Descriptive notes. 17·5-18 cm; 27 g. Distinctive. Nominate race has rather flat-looking black crown, yellow coronal patch (semi-concealed), grey supercilium, dusky auriculars; upperparts largely dull smoky brownish-grey; wings smoky brown, slight pale edges on inner remiges and wing-coverts; tail long, dull smoky brownish-grey; dingy and uniformly pale smoky brownish-grey below, slightly paler on belly, some yellowish to brownish tinge on belly and undertail-coverts; iris dark; bill rather short, blackish, with short rictal bristles; legs black. Sexes alike. Juvenile resembles adult, but has more brownish crown lack coronal patch, white and more prominent supercilium, pale rusty margins on wing feathers, rufous margins on tail feathers; similar to adult *Empidonomus varius*. Race *pallidiventris* is smaller than nominate, has shorter and less robust bill, paler greyish-olive upperparts, also generally paler below, more yellowish-tinged crissum with very little greyish-brown along shafts. Voice. Generally fairly quiet; when breeding, rather weak "pseek" or high, thin "pseeet", sometimes repeated in series; also thin, buzzy and rising "be-bee-beee-beeez", low whistling "pree-ee-ee-er" and a series of squeaky notes, or a two-part "tsi-tsitsewbit tsitsewt-tsi-tsébidit" phrase, generally considered to be songs. Occasional loud wing rustle, "ewrrrr", reported.

Habitat. Canopy of tall humid forest, lighter woodland, scrubby pastures, and open savannas with some scattered tall trees; austral migrants frequent edges of *terra firme* or *várzea* and clearings within humid forest. Generally at lower elevations, sometimes to 1100 m, but recorded at c. 2000 m in arid intermontane valleys in Boliva; two records at 1600 m and 2500 m in Ecuador (E Loja and W Napo, respectively); once at 2500 m in Venezuelan Andes (Mérida).

Food and Feeding. Insects, also some fruit. Usually solitary, especially migrants in non-breeding season, or in pairs. Regularly perches in the open on top of bushes and trees; sometimes seems rather lethargic. Hawks insects by sallying repeatedly, returning to same well-exposed perch high in canopy.

Breeding. Nests with eggs recorded Nov to early Jan, and nestlings mid-Dec to late Dec/ early Jan. Nest more or less round to oval and cup-shaped, external diameter c. 12-16 cm, height 5-7 cm, often rather flat and loosely constructed, with shallow egg-chamber c. 7-8 cm wide and 3·5 cm deep, composed primarily of smaller twigs (generally c. 2-3 mm thick, occasionally some pieces as large as 10 cm) and leaf stems, lined with rootlets and grass; usually placed in fork of horizontal tree branch c. 2-6 m above ground and often fairly close to trunk, but also as much as 2 m from main bole. Clutch 2-3 eggs, sometimes 4, laid on consecutive days; incubation period c. 15-16 days; nestling period c. 16 days. Nests sometimes parasitized by Shiny Cowbird (*Molothrus bonariensis*).

Movements. S race (nominate) migratory, moving primarily to W Amazonia; recorded in non-breeding season in NE Peru (Loreto, E San Martín), E Ecuador, SE Colombia (Putumayo), Brazil (Acre, Rondônia, Amazonas, and Pará N to Manaus and Belém), extreme S Venezuela (S Amazonas), and probably S Guyana; some records of wanderers from N & W Venezuela (Aragua and NE Mérida). Austral migrants occur in Colombia and Ecuador probably from late Mar to Sept (some may linger to Nov), with specific Jun records from Putumayo, Vaupés and Leticia.

Status and Conservation. Not globally threatened. Generally common and fairly widespread. Occurs in many protected areas. Given its large range and wide habitat preferences, including tolerance of converted and disturbed habitats, this species is unlikely to be at any risk.

Bibliography. Allen (1995), Barrows (1883), Bates & Parker (1998), Belenguer & Di Martino (1993), Birdsley (2002), Canevari *et al.* (1991), Chesser (1997), Clements & Shany (2001), Contino (1980), Cory & Hellmayr (1927), Di Giacomo (2004), Dubs (1992), Friedmann (1927), Hartert & Venturi (1909), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Klimaitis & Moschione (1987), Lanyon (1984a), López (1997), Lowen *et al.* (1996), Meyer de Schauensee (1966, 1982), Mezquida (2002), Miserendino (1998), Mobley (2002), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Narosky *et al.* (1990), Naumburg (1930), Nores *et al.* (1983), Pearson (1980), de la Peña (1987, 1988, 1995, 1999), Pérez & Petracci (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schönwetter & Meise (1968), Short (1975), Sick (1993, 1997), Smyth (1928), Stotz *et al.* (1996), Wetmore (1926), Zimmer (1937b).

PLATE 42 ➤



PLATE 42

inches 4

cm 10

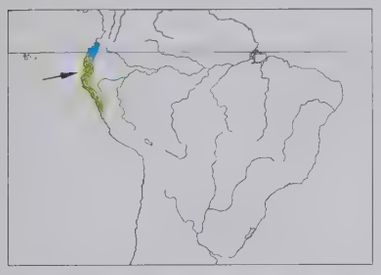
Genus *TYRANNUS* Lacépède, 1799

355. Snowy-throated Kingbird

Tyrannus niveigularis

French: Tyran chimu **German**: Schneekehl-Königstyrann **Spanish**: Tirano Gorginíveo

Taxonomy. *Tyrannus niveigularis* P. L. Sclater, 1860, Babahoyo, Los Ríos, Ecuador.
Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions; present species appears to be most basal to an expanded "tropical group" that also includes *T. albogularis*, *T. melancholicus*, *T. couchii*, *T. dominicensis* and *T. savana*. Monotypic.
Distribution. Extreme SW Colombia (SW Nariño), W Ecuador (from C Manabí S, including La Plata I, to El Oro and extreme SW Loja) and W Peru (S to Ancash).



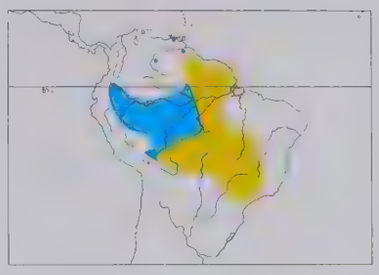
Descriptive notes. 19 cm. Has head largely grey, semi-concealed yellow coronal patch; narrow blackish forehead and blackish band from lores back to auriculars contrast strongly with whitish lower cheeks, creating distinctly masked appearance; upperparts mostly pale grey, becoming more olive on lower back and rump; wings dusky, whitish edging on wing-coverts and inner secondaries; tail nearly blunt-ended, blackish; throat bright white, becoming pale greyish on chest and clear pale yellow on breast and belly; iris dark; bill large, stout, blackish; legs dark. Distinguished from *T. melancholicus* by slightly smaller size, square-ended (not notched) tail, greyer back, whiter throat, paler underparts. Sexes alike. Voice. Short, dry series of "kip" notes, sometimes drawn out into snappy "kip, kr-r-e-e-e", or a thin twittering series.
Habitat. Primarily arid and fairly open country and agricultural areas having scattered groves of trees and bushes; also occurs in semi-open areas with suitable patches of scrub woodland, borders of deciduous woodland, acacia (*Acacia*) in washes, and even coastal desert scrub; sometimes observed in clearings and along edges of humid forest during non-breeding period. To 1200 m, mostly below 500 m; rarely to 1350 m in Ecuador (Mindo).
Food and Feeding. Insects and berries. Perches on tops of bushes, usually in less exposed situations compared with *T. melancholicus*. Hawks flying insects; said also to snatch berries while in flight.
Breeding. Breeds during rainy season, Jan/late Feb to mid-May/July, in SW Ecuador; sometimes double-brooded. Typical nest cup-shaped, c. 8-10 cm in diameter, composed of rather long, thin twigs, dead plant stems and lichen, lined with plant fibres, rootlets and/or hair; usually placed c. 2-8 m up on long, slender branch or stem towards outside of large bush or small isolated tree (live or dead); nest reported as sometimes reused for second breeding attempt. Clutch 3-4 eggs, rarely 2; incubation period estimated at c. 15-16 days and nestling period at c. 14-19 days.
Movements. Sedentary to partially migratory, moving relatively short distances to more humid areas during dry periods; some movement N occurs, and records from SW Colombia and from NW Ecuador N of Manabí probably refer to migrants.
Status and Conservation. Not globally threatened. Uncommon to locally common. Occurs in several national parks and other protected areas, e.g. Cerro Blanco Forest Reserve, Machalilla National Park, Loma Alta Ecological Reserve and Río Palenque Science Centre, all in Ecuador, and Northwest Peru Biosphere Reserve, in Peru. Able to thrive in converted habitat.
Bibliography. Birdsley (2002), Butler (1979), Chapman (1917c), Clements & Shany (2001), Cory & Hellmayr (1927), Hilty & Brown (1986), Marchant (1960), Meyer de Schauensee (1982), Mobley (2002), Phillips (1994a), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Smith (1966), Stotz *et al.* (1996).

356. White-throated Kingbird

Tyrannus albogularis

French: Tyran à gorge blanche **German**: Weißkehl-Königstyrann **Spanish**: Tirano Gorgiblanco

Taxonomy. *Tyrannus albogularis* Burmeister, 1856, Lagoa Santa, Minas Gerais, Brazil.
Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions; present species may belong to a clade within the "tropical assemblage" that also includes *T. couchii* and *T. savana*, although relationships among these three species uncertain. Monotypic.
Distribution. Breeds from extreme SE Venezuela (SE Bolívar) and the Guianas S through much of C Brazil (Pará, Amapá and Tocantins S to Mato Grosso do Sul, São Paulo, Minas Gerais and W Bahia) to N Boliva (Beni, N Santa Cruz); migrates W across Amazonia (W to extreme SE Colombia, E Ecuador and E Peru).
Descriptive notes. 20-21 cm; 38 g. Has mostly pale grey head, whitish crown with semi-concealed pale orange or yellowish coronal patch; contrasting dusky band from lores back to auriculars, giving distinctive masked appearance; upperparts mostly bright olive-green; wings dull blackish-brown, pale edging on secondaries and margins on wing-coverts; tail rather long, notched, black; throat pure white; underparts bright yellow, very faint (not always obvious) tinge of olive across chest; iris dark; bill large, stout, dark; legs blackish. Distinguished from *T. melancholicus* by slightly smaller size, distinctly paler head, bright olive back, pure white throat and lower cheeks contrasting more with yellow underparts. Sexes alike. Voice. Generally considered less vocal than congeners. Typical call a shrill, trilled "tic tic tic'i'i'i'i'i'i'i'i'i'i'i'i'i"; occasionally long and irregular series of "tic" notes and trills, sometimes for several minutes at a time; similar to *T. melancholicus*, but somewhat higher and thinner, and delivered more rapidly, hence more squeaky in quality.



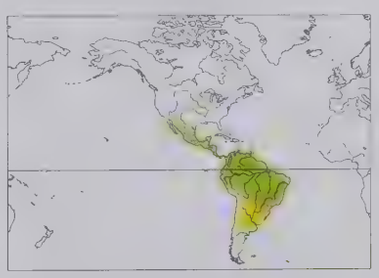
Habitat. Variety of tropical lowland habitats, such as *cerrado* and savanna, that are fairly open, but shrubby and usually near water; also smaller trees and bushes along edges of gallery woodland, lagoons on river islands, and regularly in stands of moriche palms (*Mauritia flexuosa*) and occasionally *Scheelea* palms. Outside breeding period appears to use wider variety of habitats, including around urbanized areas (especially fence rows), but still usually in close proximity to open water or damp grassland. To c. 1000 m, but mostly below 100 m.
Food and Feeding. Insects. Hawks flying insects from relatively low and exposed perch 3-4 m above ground; may perch higher during breeding period in Brazil.
Breeding. Insufficient information. Apparently builds a simple cup-nest. Seems to be not so aggressive as are its congeners towards other birds.
Movements. Austral migrant; specific movement patterns not well known, probably resident in at least some N parts of range. Migrates during austral winter (approximately May-Aug) into and across W Amazonia, reaching as far as extreme SE Colombia (sight records May to late Aug), E Ecuador (three Jul-Aug records along R Napo) and NE Peru (Loreto, Ucayali); migratory status in Venezuela uncertain, e.g. sight records in Jul in NE Bolívar (El Palmar), Mar in SE Bolívar (San Fernando de Yuruaní) and Feb and Jun in NW Amazonas (Puerto Ayacucho). Sometimes in mixed flocks with *T. melancholicus* during periods of migratory movement.
Status and Conservation. Not globally threatened. Uncommon to locally common; possibly overlooked. Rather poorly known, and precise breeding range uncertain; presumed to breed in small numbers in vicinity of Santa Elena de Uairén, in SE Bolívar (Venezeula), although this not yet formally documented. Occurs in many national parks and other protected areas throughout its range, e.g. Anavilhanas Ecological Station, EMBRAPA Experimental Station and Brasília and Serra da Canastra National Parks, in Brazil, and Beni and Pilón Lajas Biosphere Reserves and Madidi and Noel Kempff Mercado National Parks, in Bolivia. Given its tolerance of converted habitat and its large range, this species does not appear to be at any risk; nevertheless, further study is needed in order to determine its precise ecological and breeding requirements.
Bibliography. Bates & Parker (1998), Birdsley (2002), Chesser (1997), Cintra (1997), Clements & Shany (2001), Cory & Hellmayr (1927), Davis (1993), Dubs (1992), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (1999, 2003), Hilty & Brown (1986), Lentino & Colvée (1998), Mobley (2002), Novaes (1978a), Phillips (1994a), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Sick (1993, 1997), da Silva *et al.* (1997), Smith (1966), Snyder (1966), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992), Zimmer (1937b).

357. Tropical Kingbird

Tyrannus melancholicus

French: Tyran mélancolique **German**: Trauerkönigstyrann **Spanish**: Tirano Melancólico
Other common names: Heine's Kingbird ("*T. apolites*")

Taxonomy. *Tyrannus melancholicus* Vieillot, 1819, Paraguay.
Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions. Present species formerly treated as conspecific with *T. couchii* owing to limited hybridization in Mexico (S Veracruz, Atlantic slope of N Oaxaca), and possibly intergrades with it, but differs significantly in voice. Furthermore, recent molecular data indicate that these two are not each other's closest relatives, but that present species is sister to *T. dominicensis*, with both nested within an expanded "tropical assemblage" as sister-group to an unresolved clade consisting of *T. albogularis*, *T. couchii* and *T. savana*. In addition, a possible hybrid "*T. apolites*" between present species and *Empidonomus varius* described from Rio de Janeiro area of SE Brazil. Geographical variation over the species' enormous range very inadequately known, and current taxonomy potentially erroneous; race *satrapa* apparently intergrades with nominate. Three subspecies currently recognized.
Subspecies and Distribution.
T. m. satrapa (Cabanis & Heine, 1859) - extreme SW USA (SE Arizona, SW New Mexico, S Texas) and W & E Mexico (both slopes S from Sonora, Tamaulipas and S San Luis Potosí to SE Veracruz and E Oaxaca; also Yucatán Peninsula) S to Panama, N Colombia and much of N Venezuela (mostly N of R Orinoco, also along S bank in NW Bolívar); also Trinidad, Tobago, Grenada and Netherlands Antilles.
T. m. melancholicus Vieillot, 1819 - throughout tropical South America (except N Colombia, N Venezuela and NE Brazil) S to WC Peru (Lima) and, E of Andes, to SE Bolivia and C Argentina (S to Neuquén and NC Río Negro).
T. m. despotes (M. H. K. Lichtenstein, 1823) - NE Brazil (Amapá, Maranhão and Ceará S to Bahia).



Descriptive notes. Male 18·4-24 cm, 32-40·6 g; female c. 18·5-22 cm, 32·7-42·5 g. Male has crown and side of head mostly pale grey, semi-concealed red or orange to reddish-orange coronal patch; dusky lores and auriculars create masked appearance; upperparts mostly greyish-olive or greenish, uppertail-coverts brownish-black; wings dusky or dull blackish-brown, pale whitish edging on secondaries, dull grey margins on wing-coverts; outer five primaries with distinctly attenuated tips (c. 10 mm long, 2-3 mm wide); tail rather long, notched, dusky brown or black; whitish on throat, fading to pale grey on foreneck, becoming tinged with pale greyish-olive to yellow-olive on chest, rest of underparts bright yellow; iris dark brown; bill large, fairly stout, black; legs black. Distinguished from very similar *T. couchii* by slightly larger size, more grey (less greenish) back, relatively larger bill, but mainly by voice.

On following pages: 358. Couch's Kingbird (*Tyrannus couchii*); 359. Cassin's Kingbird (*Tyrannus vociferans*); 360. Thick-billed Kingbird (*Tyrannus crassirostris*); 361. Western Kingbird (*Tyrannus verticalis*); 362. Eastern Kingbird (*Tyrannus tyrannus*); 363. Grey Kingbird (*Tyrannus dominicensis*); 364. Loggerhead Kingbird (*Tyrannus caudifasciatus*); 365. Giant Kingbird (*Tyrannus cubensis*); 366. Scissor-tailed Flycatcher (*Tyrannus forficatus*); 367. Fork-tailed Flycatcher (*Tyrannus savana*).

Female is nearly identical to male, but has smaller coronal patch, and only slightly attenuated outer (four) primaries. Immature is similar to adult but duller overall, coronal patch absent or greatly reduced, more whitish throat, buffy or pale cinnamon margins on wing-coverts, cinnamon edges on uppertail-coverts, remiges edged with pale lemon yellow, little or no attenuation of outer primaries. Races are all very similar: *satrapa* has slightly brighter upperparts and whiter throat than nominate; *despotes* smaller than nominate, with narrower chest band and whiter throat. Voice. Similar to *T. dominicensis*, but a softer and less emphatic "pip- pri-pip-pri-pip-pri" or more rapid and twittering "pip-pip-pip-pip"; call in Mexico described as bright and fluid trill, e.g. "tree-e-eer", "tril-il-il-lil-l" or "trri tri-li-lit í-il" (said to be drier and more tinny in W Mexico), or short and bright "si-seep", while characteristic songs a loud and sweet-sounding series of notes that accelerate through later part, "weet weet weet-weet-weet", or broken series of trills and short, bright note followed by liquid trill, "sweeit tri-í-í-í-il". In South America conspicuous dawn song throughout year, heard quite early and often long before first light, consists of short series of "pip" notes followed by rising and twittering "pirririreee"; dawn song of male described as medley of short, clear "pit prrrrr pit pit prrrrr" notes and thin ascending trills or a couple to several short "pip" notes followed by rising twitter. When excited, partners often call back and forth with variety of high twittering "tre'e'e'e'e'e'eip" trills while vibrating wings or during short flights and when alighting. Sharp crackle, likely generated by wings, heard from birds in flight at close range.

Habitat. Wide variety of habitats, often near water. Widespread throughout lowlands in mostly open and semi-arid scrubland with scattered trees, from deserts to arid or wet montane areas; also frequents humid and dry forest borders adjacent to suitable open country, clearings within largely forested areas, thorn-scrub, scrubby woodland, second growth, beach scrub, mangroves, cactus stands, marsh and river edges, agricultural regions, roadsides, and even busy urban areas; in S Texas (USA) breeds primarily in areas of human disturbance, such as golf courses, electric substations and football fields. Lowlands to 1850 m; occasionally to 2400 m in Central America, to 2200 m (rarely 3000 m) in Venezuelan Andes, to 2500 m in Ecuador (once to 2800 m) and Peru, and commonly to 3100 m in cleared areas in Colombia (Cundinamarca).

Food and Feeding. Almost exclusively insectivorous, taking primarily hymenopterans (wasps, bees), dragonflies (Odonata) and butterflies (Lepidoptera); at least some fruit eaten opportunistically, especially during migratory movements. Analysis of 94 prey items taken from stomachs in SE Peru gave: Hymenoptera (ants 37%, bees and wasps 31%); Isoptera (19%); Coleoptera (5%); Hemiptera (3%); and others (5%). Usually solitary. Perches conspicuously, mostly 3 m or higher; sometimes sallies from low perch, such as a fence, but seems to prefer higher perches for foraging (e.g. top of 30-m snag along forest edge); most often above 25 m (less frequently 12-25 m) in Peruvian dry-forest canopy, and at mean height of 8 m in 10-m vegetation on river islands in Amazonia; often perches on wires and buildings near gardens and plazas. Makes impressive, sometimes acrobatic sallies varying from 2 m to more than 30 m; sometimes sallies to ground, foliage or water, and occasionally takes more than one prey item in single sally. Smaller insects consumed on the wing; larger prey items taken back to perch, often beaten against perch before consumption. Often lingers close to flowers and muddy areas to hunt butterflies. Also observed to hawk insects near lights after dark in Brazil. Fruits taken from trees, shrubs, epiphytes and lianas by perch-gleaning or hover-gleaning. Ecologically and behaviourally similar to North American congeners (*T. tyrannus*, *T. verticalis*, *T. vociferans*); considered more of a foraging specialist than sympatric Neotropical flycatchers, primarily aerial hawking (c. 94% of total foraging activity, mean search time of 60 seconds). Sometimes drinks by flying low over water.

Breeding. Mar-Jul in Costa Rica; Apr-Nov in Venezuela (W Apure); Feb (Popayán), Apr-May (Santa Marta) and nest-building in Aug (Anchicayá Valley) and Nov (NE Meta) in Colombia; mostly Apr-Jul in Trinidad, and Feb, Jun and Jul in Tobago; Oct-Jan in Argentina. Nest a broad, shallow, sometimes frail or untidy and bulky bowl or cup, composed of fine dead vines, grasses, weed stems, leaf tendrils and twigs, usually lined with finer materials and sometimes horsehair; generally placed near outside of bush or on more exposed fork towards end of horizontal tree branch, at varying height (1·8-15 m), sometimes low over water; some nests loosely constructed such that eggs visible from below. Potential nest predators frequently mobbed and boldly chased from area, often with some degree of physical contact; tolerates most congeners nesting in close proximity, in Costa Rica said to direct aggression at *T. dominicensis* but not *T. tyrannus*. Clutch 2-3 eggs, in Argentina 2-4 (rarely, 5); incubation by female, period 15·5-17 days; chicks fed by both parents, fledging period 18-19 days. Nests parasitized by Shiny Cowbird (*Molothrus bonariensis*).

Movements. Apparently resident in S USA (S Texas), but at least partially migratory in N Middle America (race *satrapa*). Nominate race migratory in S parts of range, S from E Bolivia and SE Brazil; moves N to Amazonian lowlands, where large flocks May-Sept, overlapping with resident populations throughout much of N South America (Mar-Oct, especially in humid zones of E & S Venezuela), and records of occasional wintering as far N as Netherlands Antilles, also Cuba (at least three records of vagrants); transients may also occur in Ecuador (Jatun Sacha), as numbers observed to increase noticeably from Apr/May. Large-scale movement of N breeders observed mostly below 1000 m, although smaller numbers reported at altitudes above 3000 m; a few, mostly immatures, occur casually along Pacific Coast of North America (N to British Columbia) some time after nesting period over; more regularly in coastal California and offshore islands (Farallon I, Channel Is) but rarely inland; also winters in Baja California (Sept-Mar) and in C Mexico (Distrito Federal) to 2200 m. Vagrant also in NW and NE USA (SE Alaska, Maine). Occurs irregularly during migration on Grenada, some remaining to breed in some years and not occurring at all in others.

Status and Conservation. Not globally threatened. Very common. Estimated global population 200,000,000 individuals. Has extremely large range, the largest of all kingbirds. Has doubtless increased in abundance and range wherever forest has been opened up and where gardens planted in arid zones. N limit of breeding distribution of race *satrapa* has changed slightly over past 60 or so years; first documentation breeding in USA in 1938, near Tucson (Arizona), was followed by reports of breeding pairs at additional localities in the state; by 1980s, however, known regular nesting restricted to lower Santa Cruz Valley. Closer inspection in 1990s resulted in new nesting records from S Texas (where now considered resident), the result of populations spreading N up Gulf coast of Mexico, and revealed extensive breeding throughout SE Arizona.

Bibliography. Anon. (1983, 1998a), Babarskas *et al.* (2003), Baicich & Harrison (1997), Bangs & Penard (1921), Barbour (1923), Barrows (1883), Begazo (1995), Bent (1942), Berthold (2001), Binford (1989), Birdsley (2002), Bond *et al.* (1989), Cabanis & Heine (1859-1860), Canaday & Jost (1997), Canevari *et al.* (1991), Chesser (1995, 1997), Cintra (1997), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Contreras (1997), Cory & Hellmayr (1927), Cruz & Andrews (1989), Davies *et al.* (1994), Davis (1941), DeGraaf & Rappole (1995), Di Giacomo (2004), Faaborg (1985), ffrench (1991), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Fitzpatrick (1980a, 1980c, 1981, 1983), Garret & Dunn (1981), Garrido & Kirkconnell (2000), Gilligan *et al.* (1994), Guix (1995), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995, 2000), Hayes & Samad (2002), Heilfurth (1938), Henderson (2002), Hespenheide (1964), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995a), Joseph (1996), Kaufman (1996), Klimaitis & Moschione (1987), Köster (1976), Leck (1971, 1972), Lowen *et al.* (1996), Mason (1985), Meise (1949), Miller (1955a, 1963), Miserendino (1998), Meyer de Schauensee (1982), Mobley (2002), Moermond & Denslow (1985), Monroe (1968), Monson & Phillips (1981), Murphy (1989), Narosky & Salvador (1998), Norton (1916), Olson (1997), Oren & Parker (1997), Palmer (1949), Pearson (1971a, 1975), de la Peña (1987, 1988), Perry *et al.* (1997), Phillips (1994a), Phillips *et al.* (1964), Pinheiro (2003), Pyle *et al.* (1987), Quiroga *et al.* (1998), Raffaele *et al.* (1998), Rea (1969), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Roberson (1980), Robinson (1997), Robinson & Terborgh (1997), do Rosário (1996), Rosenberg (1990), Rowley (1984), Russell & Lamm (1978), Salaman (1994), Short (1975), Sibley & Ahlquist (1985c), Sick (1993, 1997), Sick & Teixeira (1981), Skutch (1954, 1960, 1985), Slud (1964), Small (1994), Staicer *et al.* (1996), Stiles & Skutch (1989), Stotz *et al.* (1996), Stouffer & Chesser (1998), Todd & Carriker (1922), Tostain *et al.* (1992), Traylor (1979b), Udvardy (1963), Voous (1983, 1985), Wetmore (1972), Wilbur (1987), Williams & Tobias (1994), Willis (1980), Wilson & Ceballos-Lascurain (1986), Wright *et al.* (1985), Zimmer, J.T. (1930, 1937b), Zimmer, K.J. (1985).

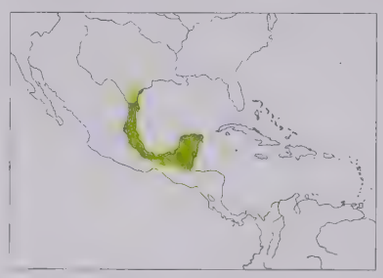
358. Couch's Kingbird

Tyrannus couchii

French: Tyran de Couch **German**: Texaskönigstyrann **Spanish**: Tirano Silbador

Taxonomy. *Tyrannus couchii* S. F. Baird, 1858, Nuevo León and San Diego, Nuevo León, Mexico. Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions. Present species formerly treated as conspecific with *T. melancholicus* owing to limited hybridization in Mexico (S Veracruz, Atlantic slope of N Oaxaca), and possibly intergrades with it, but differs significantly in voice. Furthermore, recent molecular data indicate that these two are not each other's closest relatives, but that present species is part of a clade within the "tropical assemblage" that also includes *T. albogularis* and *T. savana*, although relationships among these three remain uncertain. Has been suggested, on basis of similarities in voice and certain aspects of behaviour, that this species may be closest to *T. vociferans*, *T. crassirostris* and *T. verticalis*, although this not supported by molecular data. Finally, probable hybrid with *T. forficatus* reported from New York (USA). N birds said to have longer wing and those from Yucatán Peninsula (proposed as race *chloronotus*) have longer bill than individuals from Guatemala and Belize, but differences insufficient to warrant naming of geographical races. Monotypic.

Distribution. Extreme S USA (S Texas), E Mexico (Tamaulipas and N Nuevo León S to NE Oaxaca, N & W Chiapas, and E to Yucatán Peninsula), N Guatemala and Belize.



Descriptive notes. 20-24 cm; 40 g. Male has head mostly grey, small reddish-orange coronal patch (usually concealed), blackish lores and auriculars creating masked appearance; upperparts olive-grey to olive-green (sometimes greyer during breeding); wings blackish-brown or dull buffy brown with slighly paler margins, secondaries with broad yellowish-white outer edges, tertials edged brownish-white, wing-coverts slightly paler than remiges and with pale brownish or greyish margins; attenuated tips of primaries 6-10; tail notched, blackish-brown or dull buffy brown, rectrices with slightly paler margins; chin and throat whitish; underparts yellow, more dusky on breast; iris dark brown; bill large, fairly stout, black or brownish-black, base of lower mandible more brownish; legs black or brownish-black. Distinguished from extremely similar *T. melancholicus* by smaller bill on average, slightly greener (less grey) back, less deeply notched tail, but mainly by voice. Female is like male, but coronal patch smaller and more yellowish-orange, attenuation of primaries less pronounced. Juvenile resembles adult but lacks coronal patch and generally duller, with brownish wash on upperparts, paler yellow underparts, has buff tips on wing-coverts and uppertail-coverts, also more contrasting facial mask, blunt outer primary tips. Voice. Common calls plain and nasal "pit", "kip", "bihk" or "pik", singly or in slowly repeated series, and more distinctive shrill yet buzzy and nasal "pitweeeer", "queer", "chi-querr", "tzheeer", "brrrear" and similar, sometimes in various rolling combinations such as "pik pik pik brreeah". Mated partners give rapid series of slurred "dzh" notes as greeting, usually near nest; male also "tzeeeeerhh" call when guarding nesting territory, and dawn song (from 0·5 hours before twilight until sunrise, mainly Apr-Jun, sometimes also during migration in Sept-Oct) described as series of bright, intensifying whistles with sneezy inflections that ends abruptly, "s'wee s'wee s'wee-i-chu" or "k-leep' k-leep' k-leep' k-leep' k-lee-í-chu", with occasional "brrreeu" sometimes added, or shortened to e.g. "prreeu wi-wit wee wi-chu", "tuwit, tuwit, tuwitichw", etc. Fledglings give distinctive "wheee" begging call. Most calls given throughout year, but seems to be less vocal and sometimes virtually silent during winter months. Sometimes emits bill-snap during chases of avian rivals.

Habitat. Groves of trees, forest edge, shrubby woodland, thorn-forest or tall *chaparral*, brushy clearings within forested areas, plantations, open to semi-open areas with scattered trees and hedges, arid beach scrub, riparian areas, sometimes suburban areas with tall trees; usually near water. Also coastal grassland and scrub during migration. Primarily in lowlands, but recorded to 1000 m in Mexico (Sierra de Tamaulipas).

Food and Feeding. Insects; also fruits. Details of insect prey types taken essentially unknown; in S Texas and Yucatán Peninsula, observed to consume fruits of *Burmelia celastrina*, *Ehretia anacua*, *Condalia hookeri*, *Cissus incisa*, *Magnolia*, *Pyracantha*, *Melia azedarach*, *Sapium sebiferum*, *Busera simaruba*, *Ficus cotinifolia* (probably also *Ehretia tinifolia* and *Metopium brownii*). Most often singly or in pairs, but may join conspecific flocks of 5-50 individuals during migration or in winter; may also mingle with various other bird species, mostly medium-sized passerines, but also Golden-fronted Woodpecker (*Melanerpes aurifrons*) and Red-billed Pigeon (*Columba flavirostris*), primarily in winter or at fruiting trees. Primarily hawks flying insects from a tall and well-exposed perch, including trees, tall bushes and utility wires; usual hawking distance c. 3-15 m, but sometimes as much as 25-30 m; often, but not always, returns to same perch after pursuing prey. Also hover-gleans and perch-gleans fruit, especially during autumn and winter months.

Breeding. Breeds Mar-Aug; nest-building observed mid-Apr to mid-Jul and eggs early May to early Jun in S Texas (lower Rio Grande Valley); eggs early Apr to late Jul in Mexico. Nest-showing display thought to be pair-maintenance behaviour. Nest may be built entirely by female, taking more than 1 week; untidy cup or bowl with outside diameter 15 cm, height 5 cm, inside diameter 7·5 cm, depth 3 cm, composed primarily of twigs and usually with lining of fine rootlets, occasionally of moss and bark strips lined with plant down; usually placed in full sun 6-10 m up (recorded as low as 3 m) or c. 3 m from top of crown and attached to 3-4 thin branches about half-way between centre and outer edge of isolated tree along forest border; variety of nesting trees in S Texas, including *Celtis laevigata*, *Ulmus crassifolia*, *Pithecellobium ebano*, *Fraxinus berlandieriana*, and in NE Mexico once *Populus deltoides*; also observed to build in top of dead tree or utility pole, often nests in same tree with other species, e.g. *Pitangus sulphuratus*. Aggressive towards potential nest predators or conspecific intruders, usually giving chase for 30-40 m; nest territory seems to be most aggressively defended during earliest periods of nest-building and egg-laying. Clutch usually 2-4 eggs, sometimes 5; incubation thought to be entirely by female, period unknown; chicks fed by

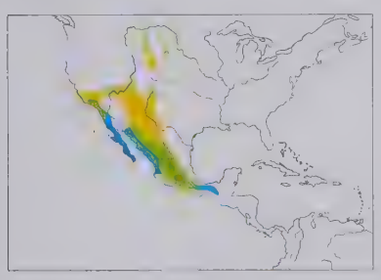
both sexes, nestling period unknown; fledglings thought to be dependent for at least 2 weeks. Parasitized rarely (c. 1 of 18 nests in S Texas) by Bronzed Cowbird (*Molothrus aeneus*), usually rejects eggs but at least occasionally rears parasite's young.
Movements. Probably resident throughout most of range, but at least partially migratory in extreme N. At least some leave S Texas and parts of NE Mexico during Nov-Mar, during which time becomes more numerous in S Mexico, including interior of Chiapas (where otherwise rare or absent in summer); forms loose pre-migratory flocks before leaving rather abruptly. Additional observation necessary in order to clarify seasonal status in S Mexico, where possibly only a winter visitor in N Oaxaca. Vagrant records (late Sept to early May, mainly Nov-Dec) from W, NC & SE Texas, Florida, Arkansas, Louisiana, New Mexico and California.
Status and Conservation. Not globally threatened. Fairly common to common. Estimated global population 1,700,000 individuals. Density at one site estimated at 5·3 territories in 8-ha plot. Sometimes breeds farther NW in Texas; recorded as nesting in Big Bend National Park on at least one occasion. Some evidence suggests that, as with *T. melancholicus*, this species increases in abundance and range wherever closed forest is opened up; numbers increased after large trees were replaced by thorn-scrub.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bangs & Penard (1921), Bent (1942), Birdsley (2002), Brush (1999a), Conant (1968), Contreras (1997), Cory & Hellmayr (1927), DeSante & Pyle (1986), Fitzpatrick (1980a), Friedmann (1925), Griscom (1950), Howell & Webb (1995a), Kaufman (1996), Lee Jones (2004), Mobley (2002), Oberholser (1974), Phillips (1994a), Price *et al.* (1995), Ridgway (1907), Sennett (1878, 1879, 1884), Smith (1966), Stotz *et al.* (1996), Traylor (1979b), Wauer (1998), Wood *et al.* (1986).

359. Cassin's Kingbird

Tyrannus vociferans

French: Tyran de Cassin **German**: Cassinkönigstyrann **Spanish**: Tirano Gritón

Taxonomy. *Tyrannus vociferans* Swainson, 1826, Temascáltepec, Mexico.
Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions. Phylogenetic analyses indicate that present species is basal to a clade including *T. verticalis* and *T. forficatus* within an "E & W species group" that also includes *T. tyrannus* and perhaps *T. caudifasciatus* and/or *T. cubensis*. On basis of similarities in voice and some aspects of behaviour, may be closest to *T. couchii*, *T. crassirostris* and *T. verticalis*, but this not yet supported by molecular data. Validity of race *xenopterus* questionable; further investigation necessary. Two subspecies tentatively recognized.
Subspecies and Distribution.
T. v. vociferans Swainson, 1826 - W & C USA (SE Montana, E Wyoming, SW South Dakota, SW Nebraska, C & S California, extreme SE Nevada, S Utah, SW & SC Colorado, N & E Arizona, New Mexico, W Texas), Mexico (Baja California, and S from W Sonora and Chihuahua to Oaxaca and Chiapas) and Guatemala.
T. v. xenopterus Griscom, 1934 - SW Mexico (highlands of Guerrero).



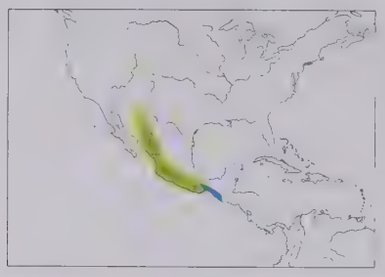
Descriptive notes. 20·5-23 cm; male 45 g, female 41·4 g. Has dusky grey head, semi-concealed orange-red coronal patch; lores, subocular area, and auriculars only slightly darker than head (faint masked appearance); upperparts mostly dark grey, back strongly washed with olive; wings dark brown with pale brownish margins (looking noticeably paler than back), outer primaries emarginated; tail relatively short, blunt to very slightly cleft, dark brownish-black, narrow buffy to whitish tips; white chin contrasts strongly with dark grey head and dusky grey throat and upper breast, which in turn contrasts sharply with yellow lower breast and belly; iris dark brown; bill relatively short, broad, pointed, mostly black, paler base of lower mandible; legs black or brownish-black. Differs from *T. verticalis* mainly in darker overall plumage, more contrasting white chin, no white on tail side. Sexes essentially alike, female with less extensive coronal patch and less attenuation of tips of outer primaries. Juvenile differs from adult in lacking crown patch, in being duller and slightly more brownish above, with buffy tips on uppertail-coverts and more prominent buffy margins on wing-coverts, generally paler below, and without attenuated tips of outer primaries. Race *xenopterus* is said to be slightly smaller, darker and greyer than nominate. Voice. Quite loud and noisy, vocalizing frequently (males most vocal and frequently counter-call), and with considerable variation in calls; most common call a loud, rough-sounding and curt "sh-beehr", "k-beehrr" or "chi-bew" (accent on second syllable), given throughout year; also rough and nasal "breeahr" or "beeah", repeated, and sometimes followed by sharp, nasal, bickering "ki-dih ki-dih ki-dih" chatter; typical dawn song includes variable series of burry, argumentative notes that climax to emphatic shrieks, "rruh rruh rruh-rruh rreahr, rruh ree ree-uhr" etc., said to resemble somewhat the voice of *Pitangus sulphuratus*. Non-vocal sounds include wing-whir used in agonistic encounters and tumble-flights.
Habitat. Variety of different habitats, including arid to semi-humid and relatively open areas with scattered trees, riparian woodland, oak (*Quercus*) savanna, coastal valleys, grassy bluffs and headlands, sagebrush and mesquite (*Prosopis*) woodland, bushes, hedges, fence rows and utility wires along roads, scrub, parks, irrigated fields, pastures, etc. Generally in thicker vegetation and less open areas than those preferred by sympatric congeners. Sea-level to 3000 m.
Food and Feeding. Primarily insects, also fruits; occasionally spiders, and even small rodents. Stomach contents of birds in C Arizona indicate beetles (Coleoptera) and Hymenoptera (bees, wasps, ants) as most common insect prey; mean size of prey selected by males 8·3 mm, by females 8·8 mm and 8·5 mm; also consumes lepidopteran larvae (both butterflies and moths), grasshoppers (Orthoptera), cicadas (Cicadidae), and even juvenile harvest mice (*Reithrodontonys*). In California stomach contents nearly identical to those of *T. verticalis*, including 14·9% beetles, 21% bees and wasps, 18·2% caterpillars and moths, 14·7% grasshoppers and crickets, 9·1% bugs (Hemiptera), flies (Diptera), dragonflies (Odonata) and spiders; total animal matter 78·6% and vegetable matter 21·4%. Fair amount of fruit eaten, including various Rhamnaceae, grape (*Vitis*), olive (*Olea europea*), elderberry (*Sambucus*), blueberry (*Vaccinium*), also seeds (Ancardiaceae), especially in winter; diet estimated to be almost entirely fruit during Sept-Jan. Captures flying insects mainly by aerial hawking from exposed perch on a tree limb or twig, bush, utility wire or fence. Occasionally forages among shrubs, vines and on the ground; likely gleaning insects directly from vegetation, as suggested by presence of caterpillars in stomach contents. In oak woodland in Sonora (Mexico) during Apr, estimated that 97·8% of total foraging time is spent in sallying activities and 2·2% in probing; perch site a twig 99·4% of time; prey obtained in the air 83·6%, on ground 8·7%, and on foliage 7·7% of the time; 60·7% of time was spent on perches 6·1-9 m high, 25·1% at 3·1-6 m, and 14·2% at 3 m above ground; mean sally distance was 21·6 m, and usually upwards. Mean perch height, sally distance and sally height in SE Arizona varied significantly with habitat type (12 m, 20·1 m and 15 m, respectively, in riparian forest, compared with 7·5 m, 15·8 m and 10·8 m in open woodland); range of heights at which insect prey captured 0-50 m. Time spent perched/watching and sallying for flying insect prey found not to vary significantly with habitat type in SE Arizona (42·6 and 8·1 seconds respectively in riparian forest, 45·9 and 8·7 seconds in open riparian woodland), whereas more variable with respect to habitat type in C Arizona (mean perch time at two different sites c. 39·6 seconds and 54·3 seconds, mean sally time less variable at 5·6 seconds and 4·4 seconds). Food competition with *T. verticalis* in areas of sympatry appears to be minimal, with individuals of each species foraging at least 3 m apart; ecological separation of these species not clear, however, and requires additional study.
Breeding. Generally early/mid-Apr to late Jul/mid-Aug (peak early May to mid-Jul) in SW USA; breeds mid-Mar to Aug in Mexico; possibly two broods occasionally in S Mexico and Guatemala. Partners reinforce pair-bond with vigorous wing-fluttering and tail-spreading displays. Nest built by female, a large, bulky cup-shaped structure, mean outside diameter and height 20 × 7·5 cm, mean inside diameter and depth 8·9 × 4·5 cm, base and walls composed of small twigs, rootlets, weed stalks, strips of inner bark, various other plant fibres, and bits of string, rags, or dry leaves, sides and rim sometimes with feathers or dried flower blossoms, lined with finer rootlets, grass, small feathers, or fluffy cottonwood (*Populus*) seeds; usually placed on top of horizontal branch at variable height (mean 8·9 m in New Mexico, USA) in large dense-canopied tree, including e.g. sycamore (*Platanus wrightii*), cottonwood, willow (*Salix*), oak, walnut (*Juglans*), bluegum (*Eucalyptus*), locust (*Robinia*) and boxelder (*Acer negundo*), also conifer (especially *Pinus*), and yucca (*Yucca*) in arid riparian areas, or on artificial structure (especially utility pole); occasionally nests at same time and in same tree as *T. verticalis*; nest occasionally reused in successive years. Male aggressive towards potential nest predators, various other non-predatory species, and conspecifics that enter territory. Clutch size varies geographically and between years according to insect supply and winter rainfall, estimated mean across range 4·1 (3·3 in Texas, 3·4 in SE Arizona, 4·2 in California); incubation by female, in three studies sitting for 55·4-78·5% of total daylight hours, incubation period probably 15-16 days; chicks brooded by female, fed mostly by female, fledging period probably at least 12-14 days after hatching; juveniles fed by parents for at least 2 weeks. Predation rates in SE Arizona estimated at 3·11 nests lost per 100 days in open riparian woodland and 1·62 nests lost in riparian forest; in all habitats, over 3 years, respectively 32·7%, 54·9% and 29·8% of eggs and nestlings lost to predation. Nest records suggest very rare occurrence of brood parasitism by Brown-headed Cowbird (*Molothrus ater*), but additional study needed.
Movements. Race *xenopterus* sedentary. Nominate race a partial short-distance migrant; wintering range from S California S just barely into W Guatemala. In general, populations in USA and N Mexico move S in autumn to W & S Mexico and parts of Baja California, while some remain in S California, NW Baja California; resident populations persist in C & S Mexico. Post-breeding departure in USA generally late Jul/mid-Aug to end Sept, later (to end Oct) at higher elevations in Texas; return Mar-May. Observations from Sonora indicate that S movements occur mostly Sept-Oct and slow considerably in Nov, and N movement begins mid-Mar and peaks in mid-Apr; transients and wintering birds from N parts of range occur mainly from Sept (earliest migrants recorded Jul) to Apr/mid-May in S Baja California and Pacific slope and adjacent interior of Mexico (S to Oaxaca); non-breeding visitors present in Guerrero (S Mexico) Oct-Apr. Records of vagrants in SE Mexico (SW Campeche), Belize, S Guatemala and C Honduras. Casual during late autumn and early winter well E of breeding range in USA, with records N to E Canada (Ontario) and E to Massachusetts, Virginia and Florida. Migrants sometimes congregate in large flocks, and sometimes mingle with small groups of *T. verticalis*.
Status and Conservation. Not globally threatened. Fairly common to common. Estimated global population at 4,300,000 individuals. USA populations can fluctuate four-fold between years. Survey data show no apparent trend between 1966 and 1996, although local extinctions occurred, possibly related to loss of nesting sites such as large trees, and decrease in amount of insect food brought on by drought cycles.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bailey (1928), Balda (1970), Barbour (1923), Baumgartner & Baumgartner (1992), Beal (1910, 1912), Bendire (1895), Bent (1942), Bergeron *et al.* (1992), Binford (1989), Birdsley (2002), Bisson (2004), Blancher (1982), Blancher & Robertson (1984, 1985), Cory & Hellmayr (1927), Dawson (1923), DeGraaf & Rappole (1995), Eike (1978), Fitzpatrick (1980a), Friedmann & Kiff (1985), Garrett & Dunn (1981), Goldberg (1979), Grinnell & Miller (1944), Griscom (1934), Hejl *et al.* (1995), Henshaw (1875), Hespenheide (1964), Howell & Webb (1995a), Hubbard (1978), Hutto (1992), Johnsgard (1979), Jones (1998), Kaufman (1996), Land (1970), Landres & MachMahon (1980), Leukering & Bradley (1997), Miller *et al.* (1957), Mobley (2002), Monroe (1968), Monson & Phillips (1981), Murphy (1989), Oakleaf *et al.* (1992), Oberholser (1974), Ohlendorf (1971, 1974), Ortega (1998), Peterjohn *et al.* (1995), Peterson (1995), Phillips (1994a), Price *et al.* (1995), Pyle (1997a), Rea (1969, 1983), Ridgway (1907), Roberson (1993), Root (1988), Rosenberg & Stejskal (1999), Russell & Monson (1998), Schaldach (1963), Scott (1993), Skutch (1997), Small (1994), Smith (1966), Stotz *et al.* (1996), Strong & Bock (1990), Sutton (1967), Swarth (1904, 1929), Thompson & Ely (1992), Travis (1992), Traylor & Fitzpatrick (1982), Tweit & Tweit (2000), Udvardy (1963), Walters, R. (1993), Walters, R.E. (1983), Wauer (1996), Wetmore (1920), Wilbur (1987), Woods *et al.* (1986).

360. Thick-billed Kingbird

Tyrannus crassirostris

French: Tyran à bec épais **German**: Dickschnabel-Königstyrann **Spanish**: Tirano Piquigrueso

Taxonomy. *Tyrannus crassirostris* Swainson, 1826, Acapulco, Guerrero, Mexico.
Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions. On basis of similarities in voice and certain aspects of behaviour, has been suggested that present species may be most closely related to *T. couchii*, *T. vociferans* and *T. verticalis*; this hypothesis, however, has not yet been evaluated with molecular data. Race *pompalis* weakly differentiated; most recent treatments consider this species to be monotypic. Two subspecies currently recognized.
Subspecies and Distribution.
T. c. pompalis Bangs & J. L. Peters, 1928 - SE USA (extreme SE Arizona, extreme SW New Mexico) and W Mexico (Pacific slope from N Sonora, W Chihuahua, Sinaloa and W Durango S to Colima).
T. c. crassirostris Swainson, 1826 - SW Mexico (Guerrero, Morelos, S Puebla, C Oaxaca, SW Chiapas) and W Guatemala.
Descriptive notes. 20·5-24 cm; 50-60 g. Plumage is mostly greyish-olive to dusky brown above, head darker greyish or dusky brown, semi-concealed yellow coronal patch; nape lighter and more greyish-brown, lores and auriculars somewhat darker grey (slightly masked appearance); wings dark brown, narrow pale cinnamon margins on wing-coverts; tail blunt to very slightly cleft, dark brown, narrow pale cinnamon to rusty-brown edging on rectrices and uppertail-coverts; mostly whitish be-



low, pale dirty grey wash on chest and upper breast, pale lemon-yellow wash on belly and crissum (brighter yellow in fresh plumage); iris dark brown; bill very thick, fairly long, dark grey to black; legs dark grey to black. Sexes similar, but female slightly smaller and usually with less extensive coronal patch. Juvenile is similar to fresh-plumaged autumn adult, but with more greyish-olive head that also lacks coronal patch, darker mask not contrast so much with, more yellowish underparts, buff-cinnamon or rufous margins on wing-coverts, remiges and rectrices. Race *pompalis* is supposedly slightly less olive above and less bright yellow below than nominate, but difference may be due to normal plumage wear. Voice. Typical call a loud, shrill "cur-a-reep" or "kitereer"; other common calls include loud high-pitched "puareet", bright and nasal "di-diweek" or "di-i-diweek", "kidiwik" or "ki-di-wi-eu", and rough and buzzy "chweeer" or "bzzzeiu" repeated numerous times and sometimes mixed with clipped "chk ch-weer" phrases or other nasal or querulous calls; song a choppy nasal series of argumentative notes reaching somewhat more emphatic ending, e.g. "ki-di-di-di di-di-dee-yew". Calls appear to be highly variable, used in different combinations and in variety of contexts. Vocalizes throughout day, but most readily at dawn and early evening; male said to vocalize more frequently than female and to give regularly repeated two-phrase "t t t t t, t t tt rwheeuh t tt" dawn song; also bill-snap noise when agitated.

Habitat. Mostly arid to semi-arid areas with sycamore (*Platanus wrightii*) groves near lowland streams, gallery and tropical deciduous forest, riparian canyons and areas with substantial sycamore, oak (*Quercus*), walnut (*Juglans*), willow (*Salix*), and/or cottonwood (*Populus*), thorn-forest (including *Acacia*, *Bombax*, *Bougainvillea*, *Cassia*, *Ceiba* and *Mimosa*, with canopy at 9-12 m); also woodland edges, clearings within forest, plantations, savanna and semi-open areas with scattered trees, hedges, desert scrub, etc. Mainly sea-level to 1850 m, but up to 2000 m in W Mexico (Sinaloa).

Food and Feeding. Poorly known. Thought to be primarily insectivorous; stomach contents of a single specimen included a large seed, suggesting that fruit consumed at least on occasion. Hawks flying insects from well-exposed perch on top of trees or tall bushes; when in wooded habitat or edges, tends to perch rather high.

Breeding. In S USA, female with fully developed egg in early Jun (SE Arizona) and nest-building observed from mid-Jun (New Mexico); in Mexico mostly early May to Jul, but nesting behaviour observed in late Apr in Morelos. Partners perform wing-fluttering display, especially during nest-building and incubation periods. Nest a rather thin, frail cup, less compact than that of congeners, composed primarily of thin twigs and grass stems that often stick out from edges and above rim (presenting a rather unfinished look), placed openly in crotch of tree branch close to trunk, usually more than 6m (up to 20 m) above ground, but sometimes as low as 1·5 m. Appears to maintain separate territory where sympatric with *T. vociferans*, but territory may overlap with that of *T. melancholicus*; aggression towards *T. verticalis* observed during nesting. Clutch 3-5 eggs, mean 4·25; incubation period c. 16 days; nestling period c. 16-18 days, perhaps longer.

Movements. Populations of race *pompalis* from Arizona, New Mexico and N Sonora said to be at least partially migratory, vacate breeding range early Sept to Oct and return early Apr to early Jun; where these individuals spend non-breeding period is not known. Populations of nominate race apparently winter S to W Guatemala. Details of movements unclear, however, and most populations thought to be resident. Casual in W Arizona, S California, lower R Colorado and Baja California during N autumn and winter. Recorded Sept-Apr on Pacific slope S to W Chiapas. Casual or accidental records N to SW British Colombia (Vancouver I) Oct-Nov.

Status and Conservation. Not globally threatened. Fairly common to common. Estimated global population 2,000,000 individuals. First recorded in USA in 1958, since when slow N expansion; now uncommon but widely dispersed in SE Arizona and SW New Mexico, and locally common, e.g. in Guadalupe Canyon (New Mexico) and Sonoita area (Arizona); also recorded W Texas. North American Landbird Conservation Plan considers this to be "Watch List" species, chiefly because of its restricted distribution in North America; management goal for this species is to maintain or increase current population numbers.

Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bangs & Peters (1928), Birdsley (2002), Blake, E.R. (1953), Blake, E.R. & Hanson (1942), Binford (1989), Cory & Hellmayr (1927), DeGraaf & Rappole (1995), Fitzpatrick (1980a), Gómez de Silva (2002), Hejl *et al.* (1995), Hespenheide (1964), Howell & Webb (1995a), Hutto (1992), Kaufman (1996), Land (1970), Lowther (2002), Mobley (2002), Phillips (1994a), Price *et al.* (1995), Ridgway (1907), Schaldach (1963), Smith (1966), Stotz *et al.* (1996).

361. Western Kingbird

Tyrannus verticalis

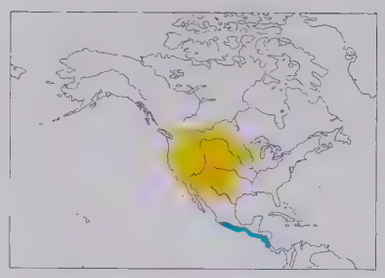
French: Tyran de l'Ouest **German**: Arkansaskönigstyrann **Spanish**: Tirano Occidental
Other common names: Arkansas Kingbird

Taxonomy. *Tyrannus verticalis* Say, 1823, near La Junta, Colorado, USA.

Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions. Phylogenetic analyses indicate that present species and *T. forficatus* form a clade, to which *T. vociferans* is basal, within an "E & W species group" that also includes *T. tyrannus* and perhaps *T. caudifasciatus* and/or *T. cubensis*. Has been suggested, on basis of similarities in voice and certain aspects of behaviour, that it may be closest to *T. couchii*, *T. vociferans* and *T. crassirostris*; but this not yet fully evaluated with molecular data. Monotypic.

Distribution. Breeds in W & C North America (S from S interior British Colombia, S Alberta, Saskatchewan and Manitoba, E to W Minnesota, W Iowa, W Missouri, Oklahoma and Texas) and N Mexico (N Baja California, also S on mainland to S Sonora and NW Chihuahua). Winters from S Mexico (Pacific coast and adjacent interior from S Jalisco and Guerrero to S Chiapas), S Guatemala, El Salvador, SW Honduras and W Nicaragua S to Costa Rica (Terraba region).

Descriptive notes. 19·5-24·1 cm; 35-40 g, male average 38·5 g, female average 37·3 g. Has head and nape pale grey, semi-concealed flame-orange to orange-red coronal patch; dark grey or dusky lores and auriculars create distinctively masked appearance; upperparts ashy greyish-olive, more olivaceous tinge on back and rump; wings rufescent brown to dark brownish-black, pale greyish-white edging on secondaries and wing-coverts; tips of outer primaries attenuated; tail blunt-ended, black, all rectrices with pale brown tips, prominent white lateral margins on outer rectrices; whitish chin and throat, blending to more pale ash-grey on chest and upper breast, rest of underparts bright yellow; wing-lining light yellowish-olive; iris dark brown or hazel; bill relatively short, black,



bluish-black or dark brown; legs bluish-black, dark slate or dark brown. Sexes alike, but female has smaller crown patch, shorter and less attenuated outer primaries. Juvenile is similar to adult but generally paler overall, lacks crown patch, has paler grey head and slightly more greyish-olive back, brownish tinge on breast, paler yellow belly, buff margins on upperwing-coverts, little to no attenuation of outer primaries. Voice. Commonest call a sharp, emphatic "whit", "bec" or "bek"; often emits short bursts of querulous and bickering chatter; song a rapid series of bickering notes that accelerate to short and squeaky chatter, e.g. "pc, pc, pc, pc pc, pc-pc pc, pree pree pr-prrr"; seven vocal patterns identified in adults, variably used in different combinations and in variety of contexts. Nestlings and fledglings beg with short and rapidly repeated wheezing call, also give shorter, fainter "pip-pip-pip" when satiated. Adults usually silent on wintering grounds, but sometimes emit a shrill metallic chatter at communal roosts. Also produces bill-snap in aggressive encounters and "whirring" sound with wings during agonistic interactions.

Habitat. Wide variety of open habitat, including grassland and savanna, sagebrush flats, desert scrub, pasture, agricultural and urban areas that have trees, shrubs or artificial structures (e.g. fence rows and utility wires) suitable for perching; also desert scrub dominated by *Larrea tridentate* and mesquite (*Prosopis*), and riparian areas containing cottonwoods (*Populus fremontii*, *P. sargentii* or *P. deltoides*), sycamore (*Platanus wrightii*) and bordered by desert or pasture, also edges of oak (*Quercus*), pine (*Pinus flexilis* or *P. ponderosa*) and juniper (*Juniperus scopulorum*) woodland. Open country with scattered trees and bushes, pasture, open pine woods and similar, preferred for breeding. In winter also in canopy of open woodland, thorn-forest and plantations. Mostly at lower elevations (below 2120 m) and valleys in montane regions; recorded to 2500 m during migration in W Mexico (Sinaloa).

Food and Feeding. Arthropods (mostly insects) comprise 90-97% of adult diet; principal prey hymenopterans, hemipterans, orthopterans, lepidopteran adults and larvae, dipterans, coleopterans, and spiders; smaller bill size of this species suggests that it takes smaller items than do congeners. Variety of berries also consumed, including those of *Sambucus*, *Crataegus*, *Morus microphylla* and *Psedera*. Feeds primarily on flying insects by aerial hawking from a well-exposed perch, sometimes making very long and acrobatic sallies; also picks insect prey from the ground or sally-gleans it from foliage. Foraging behaviour considerably more flexible compared with other flycatcher species. Large flocks of migrating birds often gather at fruiting trees.

Breeding. Timing of breeding directly related to insect abundance; egg-laying in North America from mid-Apr to Jun, generally later in N; breeds Apr-Aug in Mexico; rarely, two broods. Male performs tumbling aerial display. Nest built by female, taking 4-8 days, an open cup, sometimes bulky, often compact, outside diameter (at top of cup) 14-17·8 cm, height 7-12·7 cm, inside cup diameter 6·4-10·2 cm, depth 5·1-6·4 cm, composed of astounding variety and combination of different materials including small twigs, grass and forb stems, string, bits of plastic and cotton, rootlets, tree bark, cotton and various other plant material, usually lined with wool, hair, feathers, bits of string and cloth, cotton and leaves; placement extremely variable, including natural and artificial structures, most often in tree or shrub and saddled on horizontal branch or wedged in crotch of upward-slanting branch c. 3-17 m above ground, also commonly on utility pole, windmill, antenna, fence post, building or metal girder; some unusual nest-sites include old woodpecker (Picidae) cavity, light fixture in abandoned house, open wooden box, starch box placed on gate post, and rocky cliff; nest tree and immediate vicinity aggressively defended against conspecifics and congeners during incubation period. Clutch 2-7 eggs, average c. 4; incubation by female, period 12-19 days (mean 14 days); chicks brooded for c. 10 days, fledging occurs at c. 16 days; parental provisioning lasts 2-3 weeks. Reports of brood parasitism by Brown-headed Cowbird (*Molothrus ater*) rare.

Movements. Medium-distance migrant. Winters mainly from S Mexico S to W Costa Rica, in small numbers also from extreme S USA (regular winter resident in S Florida, and annual records until early Jan along Gulf and Atlantic coast N to Massachusetts). Recorded Sept-Apr on Pacific slope and interior from Guerrero (Mexico) to El Salvador and Nicaragua; winter resident in Costa Rica (mostly Pacific slope) Nov-Apr. Transients occur Apr-May and Aug to early Dec along most of Pacific slope and through interior to S Mexico; also recorded Apr to early May on Atlantic slope N of Isthmus of Tehuantepec. Vagrant recorded on Pacific side of Canal Zone in Panama, but considered casual in Panama; questionable record from Yucatán Peninsula. Migrants very rare, Oct-Nov, in N Bahamas, and vagrants also recorded in Cuba. Casual N to Michigan and Manitoba, and frequent autumn straggler to E North America (S from Maritime Provinces); small numbers regularly in autumn along Gulf and Atlantic coasts from Georgia N to Newfoundland and Nova Scotia. Migrates singly or in small groups, rarely in large flocks; movements appear to be primarily diurnal, but also during late evening and early morning. Often joins overwintering flocks and communal roosts with *T. savana* or *T. forficatus*, especially in W Costa Rica and W Nicaragua, where it appears most numerous.

Status and Conservation. Not globally threatened. Common. Estimated global population 19,000,000 individuals. Breeding densities vary with habitat, from c. 1 pair/3·7 ha in riparian habitat to 1 pair/15 ha in desert; attributed primarily to differences in availability of suitable nest-sites. Has increased in abundance and range over the last 100 years, largely following the opening-up of closed forest, and through human settlements and cultivation bringing vegetation and artificial structures to open areas, e.g. in Great Plains of USA. Survey data indicate that this species increased by 0·9% annually between 1966 and 1994.

Bibliography. Anon. (1998a), Arendt (1992), Baicich & Harrison (1997), Bent (1942), Bergin (1992, 1997), Birdsley (2002), Blancher & Robertson (1987), Campbell *et al.* (1997), Cory & Hellmayr (1927), DeGraaf & Rappole (1995), Fitzpatrick (1980a), Gamble & Bergin (1996), Garrido & Kirkconnell (2000), Hejl *et al.* (1995), Hespenheide (1964), Hiatt (1942), Howell & Webb (1995a), Hutto (1992), Johnsgard (1979), Kaufman (1996), Lee *et al.* (1996), Mackenzie & Sealy (1981), Mobley (2002), Nice (1924), Ohlendorf (1974), Peck & James (1997), Peterjohn *et al.* (1995), Phillips (1994a), Price *et al.* (1995), Raffaele *et al.* (1998), Ridgely & Gwynne (1989), Ridgway (1907), Root (1988), Sauer & Droege (1992), Slud (1964), Small (1994), Smith (1966), Stiles & Skutch (1989), Stotz *et al.* (1996), Udvardy (1963), Wetmore (1939), Wiedenfeld *et al.* (1992).

362. Eastern Kingbird

Tyrannus tyrannus

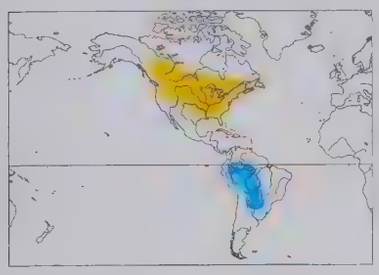
French: Tyran tritri **German**: Schieferrücken-Königstyrann **Spanish**: Tirano Oriental

Taxonomy. *Lanius tyrannus* Linnaeus, 1758, South Carolina, USA.

Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions.

Phylogenetic analyses indicate that present species is basal to a clade including *T. vociferans*, *T. verticalis* and *T. forficatus* within an "E & W species group" that may also include *T. caudifasciatus* and/or *T. cubensis*. W populations of this species sometimes separated (as race *hespericola*) from E ones primarily on basis of differences in lengths of wing, tail and tarsus and in width of white terminal tailband, but considered insignificant. Monotypic.

Distribution. Breeds throughout much of North America, from British Columbia E to Newfoundland, S to N New Mexico, C Texas and S Florida (absent only in Alaska, much of N Canada, and parts of W & SW USA). Winters in South America S to Argentina.



Descriptive notes. 19-23 cm; 40-42 g. Has crown and side of head black, semi-concealed red to orange-red (sometimes yellow) crown patch; often appears slightly crested; upperparts dark slaty blackish-grey; wings blackish-brown, wing-coverts and secondaries with narrow pale grey-white margins (two rather indistinct wingbars); tips of outer two primaries notched and attenuated; tail blunt (somewhat rounded), black, with prominent white terminal band; mostly white below, pale greyish tinge across chest and upper breast; iris dark brown; bill relatively small and short, black; legs dull black. Differs from *T. caudifasciatus* mainly in darker back, more distinct and whiter tailband, whiter belly, proportionately smaller bill. Female slightly smaller, with smaller crown patch, and attenuation only on outermost primary. Juvenile similar to adult but much duller and more pale overall, slightly more brownish-grey above with slight cinnamon edges on nape and rump feathers, pale buffish margins on wing-coverts and outer edges of primaries, darker greyish wash on breast, no crown patch, and little or no white (more pale brown) in tailband, little or no emargination of outer primaries. Voice. Most frequent call a harsh "dzeet" or "zeet", sometimes in series, or high, thin and scratchy "keer"; also series of dry chattering "chatter-zeer" and strident shrill "kip-kip-kipper" or "dzee-dzee"; most complex vocalization a dawn song by male that consists of continuous alternation of two complex phrases, "t't'tzeer, t't'tzeer, t'tzeetzeetzee"; numerous other, mostly high-pitched and rather short calls by both sexes variably used in different combinations and in various contexts; males tend to vocalize more than females. Non-vocal sounds include bill-snap during aggressive encounters, and wing-whirring during chases (likely produced by attenuated tips of primaries). Practically silent when migrating and in wintering areas.

Habitat. Variety of forested and open terrain, including canopy, borders and clearings of open humid forest and semi-open woodland, fields with scattered shrubs and trees, farmland, pastures, orchards, along shelterbelts, parks and golf courses, gardens and towns, and even riparian areas in desert habitat; often near water. May occur in much wider variety of habitats during migration, e.g. marsh-meadow, scrub, dune, and pine forest. In winter mostly river and lake edges; canopy of fruiting trees, but never frequents forest interior. Mostly below 800 m, but as high as 1700 m in Venezuela and highlands of Central America, 2600 m in Colombia during migration, and 3700 m in Ecuador.

Food and Feeding. Primarily flying insects during breeding season; occasionally small vertebrates, such as frogs; also substantial quantities of fruit and arillate seeds, especially during migration and almost exclusively in non-breeding quarters. From analyses of stomach contents, main insect prey (and estimated relative proportions) as follows: Hymenoptera (32·4%), Coleoptera (25·4%), Orthoptera (11·8%), Hemiptera (3·8%), Diptera (3·2%). Fruits and seeds from at least 40 different plant species identified, including *Morus*, *Amelanchier*, *Prunus*, *Rubus*, *Sambucus canadensis* and *Solanum dulcamara*. Flying insects captured by aerial hawking (at a rate of c. 1 predation attempt/minute) from exposed perch c. 1-4 m high (mean 1·3 m, range 0·5-9 m), usually on top of herbaceous plants and small shrubs in fields, but also from fence lines and posts; foraging flight distance averages 2·9 m (range 0·9-7·6 m) and lasts c. 3 seconds; returns to same perch c. 50% of time, with longer sallies more often resulting in change of perch site. Also captures insects from vegetation, ground and sometimes water, by outward and upward striking, perch-to-ground sallies, and hover-gleaning; in absence of suitable perches, will hover in air current and make 10-20 predation attempts in a single flight. On wintering grounds in South America, tends to be dominated by other frugivores and regularly forages with *T. melancholicus* and *T. savana*; large groups of up to thousands of birds often congregate at fruiting trees (especially *Ficus*) during migration or in wintering areas; large numbers congregate in scrub along Caribbean coast of Central America to eat *Cordia curassavica* berries.

Breeding. Late Apr to Aug; timing varies geographically and within populations. Aerial courtship display observed; partners often greet each other with a wing-flutter display. Nest built by female, taking at least 1 week (sometimes over 2 weeks, depending on weather conditions), a relatively large and sturdy open cup, sometimes with rather messy exterior and more elliptical shape, composed primarily of small twigs, coarse roots, dry weed stems, sometimes strips of bark, softer interior of willow (*Salix*) catkins and cottonwood (*Populus*) or cat-tail (*Typhus*) down, often lined with plant down, hair and/or feathers, with occasional incorporation of odd materials such as string, bits of plastic and paper, cigarette butts and even monofilament; average outside diameter 14 cm, height 8·25 cm, inside diameter 7·6 cm, depth 4·5 cm; usually placed openly on horizontal limb c. 0·5-2 m from outside edge of canopy and to more than 20 m above ground (most c. 2-8 m, or c. 2·5 m over water) in variety of tree species, including *Cratageus*, *Ulmus*, mulberry (*Maclura pomifera*), *Picea abies*, cottonwood, oak (*Quercus*), willow, *Acer*, *Gleditsia*, *Carpinus caroliniana*, *Thuja occidentalis* and *Platanus occidentalis*, or often on artificial structure (especially utility pole); also in top of snag, sometimes in depression that nearly creates a cavity, or in crotch close to trunk; old nest occasionally reused, site often reused, and observed to use old nests of *T. forficatus* and oriole (*Icterus*) and to build on top of old nest of American Robin (*Turdus migratorius*). Very vocal and aggressive towards conspecifics and others, with chasing, crouching, tail-spreading, feather-ruffling, but tolerance increases as season progresses and often nests in rather close proximity to heterospecifics, including congeners, without incident. Clutch 2-5 eggs (mode 3, varies geographically), laying begins c. 6 days after nest completed, but may be as little as 2 days or as much as 14 or even 21 days; up to three replacement clutches per season when successive nest failure occurs; incubation by female, period c. 14-17 days; chicks fed by both sexes, nestling period c. 16-17 days; young fed by parents for 3-4 weeks after fledging. Brood parasitism by Brown-headed Cowbird (*Molothrus ater*) occurs, frequency unknown and appears to vary geographically.

Movements. Migratory; winters in South America throughout most of Andes (Colombia S to S Bolivia) and much of Amazonia, S to Paraguay and NW Argentina; occasionally in W & S Venezuela and N Chile (Arica). Largest numbers winter in W Amazonia, Sept-May, most numerous Dec-Feb. Most movements appear to be overland through Central America, although some degree of trans-Gulf movement apparent and likely as primary spring route. Transients occur in E Mexico late Mar/Apr-May and late Aug-Oct; on both slopes in Costa Rica from late Aug/early Sept to late Oct and late Mar to mid-May; in Panama from early Sept to late Nov and late Mar to mid-May, along entire Caribbean slope and Pacific slope (some may overwinter) E from Canal Zone and irregularly in W Panama; in Cuba (including I of Pines), recorded more frequently in W regions Jul-Oct and Mar-Apr, and rarely in E Cuba; also in Cayman Is, N Bahamas, Jamaica, and San Andrés; throughout Caribbean, S-bound migrants appear more common Sept-Oct, while N-bound migrants less frequently recorded Apr-May. Migrants pass through Colombia mostly Sept-Oct and Mar-May and E & NW Ecuador late Sept/Oct-Nov and Mar-Apr/late May, to overwinter primarily in Peru (mainly lowlands E of Andes, rarely in coastal lowlands S to Arequipa), W Brazil and N & E Bolivia; some specimens and numerous sight records of transients in Venezuela, also scattered across Amazonia to the Guianas; smaller numbers S to Chile (S to Valparaiso) and N Argentina (Salta, Tucumán, Formosa, Misiones); a single record from W Bahia (E Brazil). Accidental in Falkland Is; vagrant recorded South Georgia (Nov 1973). Migratory parties from small groups of 5-12 birds to large flocks of several hundreds or even thousands of individuals, which often congregate at night to roost in tall trees, often with other species; larger flocks and more rapid passage more apparent in autumn; a few individuals sometimes mixed with *T. savana* in huge diurnal migrating flocks in Amazonia.

Status and Conservation. Not globally threatened. Common. Estimated global population 13,000,000 individuals. Survey data reveal no apparent trend in breeding numbers between 1966 and 1991, but abundance and trends vary greatly between different US regions; pesticide use, collisions with vehicles, and habitat degradation possibly contribute to negative trends.

Bibliography. Anon. (1998a), Baicich & Harrison (1997), Barbour (1923, 1943), Bent (1942), Biaggi (1983), Birdsley (2002), Blake & Loiselle (1992a), Bradley (2000), Buden (1987a), Campbell *et al.* (1997), Canevari *et al.* (1991), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Davis (1941, 1955), DeGraaf & Rappole (1995), Fjeldså & Krabbe (1990), Fitzpatrick (1980a), Garrido & Kirkconnell (2000), Gómez & Aguilar (1998), Haffer (1975), Hausman (1925), Hayes (1995), Hespenheide (1964), Hiatt (1942), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Johnsgard (1979), Johnson (1967), Kaufman (1996), Lamb (1925), Mackenzie & Sealy (1981), McKitrick (1990), Miserendino (1998), Mobley (2002), Murphy (1983a, 1983b, 1983c, 1986a, 1986b, 1986c, 1989, 1996, 2000b), Murphy *et al.* (1997), Paynter (1995), de la Peña (1988), Peterjohn *et al.* (1995), Phillips (1994a), Price *et al.* (1995), Raffaele *et al.* (1998), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson (1997), Robinson *et al.* (1988), Rowe, Murphy & Roper (1998), Rowe, Murphy *et al.* (2001), Sauer & Droege (1992), Sibley & Ahlquist (1985c), Sick (1993, 1997), Siderius (1993), Slud (1964), Small (1994), Smith, W.J. (1966, 2001), Staicer *et al.* (1996), Stiles & Skutch (1989), Vuilleumier & Williams (1964), Wetmore (1972), Wiedenfeld *et al.* (1992), Wilson & Ceballos-Lascurain (1986), Woodard & Murphy (1999), Zimmer (1937b).

363. Grey Kingbird

Tyrannus dominicensis

French: Tyran gris **German**: Grauer Königstyrann **Spanish**: Tirano Dominicano

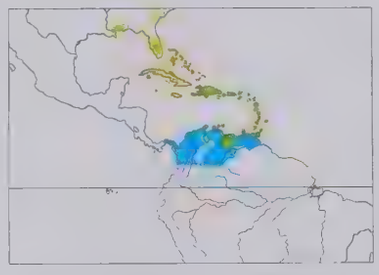
Taxonomy. [*Lanius Tyrannus*] *dominicensis* J. F. Gmelin, 1788, Santo Domingo, Dominican Republic.

Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions. Phylogenetic analyses indicate that present species is sister to *T. melancholicus*, the two nested within an expanded "tropical species assemblage" as sister-group to an unresolved clade consisting of *T. albogularis*, *T. couchii* and *T. savana*. Race *vorax* only weakly differentiated. Two subspecies currently recognized.

Subspecies and Distribution.

T. d. dominicensis (J. F. Gmelin, 1788) - breeds SE USA (SE North Carolina, Georgia, and SE Mississippi to Florida), Bahamas and Greater Antilles, and also locally in NC Venezuela (S to Apure), Trinidad and Tobago, Curaçao, Bonaire, and possibly N Colombia; winters from Panama S to C Colombia and S & E Venezuela.

T. d. vorax Vieillot, 1819 - Lesser Antilles.



Descriptive notes. 21-25 cm; 44-47 g. Dark grey head, crown feathers with dusky shaft streaks, semi-concealed yellow-orange to orange or red coronal patch; dusky lores, subocular area and auriculars (distinctly masked appearance); upperparts mostly pale grey to dark grey, uppertail-coverts blackish with cinnamon edges; wings dusky black or dark brownish, narrow whitish margins on wing-coverts and remiges; tips of outermost primaries slightly attenuated; tail notched, dusky brown or blackish; throat white; underparts whitish, greyish tinge across breast, faint yellowish wash on belly and crissum; iris brown to dark brown; bill large, quite heavy, long, slightly glossy black; legs shiny black. Differs from *T. tyrannus*, *T. caudifasciatus* and *T. cubensis* mainly in grey (not black) head and notched tail. Sexes similar, but female has smaller crown patch. Juvenile resembles adult, but browner above, lacking crown patch, no attenuation of outer primaries, and with brownish or cinnamon margins on wing-coverts, rump and tail. Race *vorax* larger and slightly darker, with larger bill. Voice. Common call emphatic, shrill and rambling "pit-piteerri-ri-ree" or "pitch-chir'r'r're" slightly trilled chatter; also gives shorter, quicker, throaty and rolling "pi-tirr-re" or "pe-cheer-ry" that is more accented on second sylable; trilled "trii-il-il-il" call, reminiscent of that of *T. melancholicus* but harsher; male dawn song a more musical, 6-note variation of call, "pi-ti-réee, pi-ti-rro"; also sharp "peet", "burr" and "tirré". Non-vocal sounds include bill-snapping during courtship and when approaching roosting site, and wing-whirring (function unknown).

Habitat. Primarily dry and open habitats in coastal areas near water, generally avoiding dense forest; also in open forest, open and semi-open areas with scattered trees and bushes, relatively open pine (*Pinus*) and oak (*Quercus*) woodland, areas with scattered *Sabal*, scrub, secondary woodland, edges of mature lowland forest, *llanos*, grassland, farmland, parks, and towns in lowland and cleared montane regions; local in borders of mangroves. Seems to venture farther inland during migration and in wintering areas. Mostly below 500 m; but may occur to 1700 m in Venezuela, and sometimes as high as 2500-3000 m in Andes of Colombia.

Food and Feeding. Wide variety of large flying insects taken, including beetles (Coleoptera), hymenopterans, orthopterans, bugs (Hemipera), flies (Diptera), lepidopterans and dragonflies (Odonata), also arachnids; occasionally small lizards (*Anolis*); also observed to prey on small fish (*Poecilia*); rarely, seen to capture and consume *Eulampis* hummingbirds, perhaps having mistaken them for large insects. Also eats considerable quantities of fruit, including *Roystonea borinquena*, *Xathoxylum*, *Lantana*, *Cordia*, *Etaphrium simaruba* and *Chrysobalanus*. Usually perches conspicuously c. 6-10 m up, rarely lower than 2 m, on top of a bush, bare treetop, fence or telephone wire. Insects taken primarily by aerial hawking (pursuit flights up to 30 m), also hover-gleaned from foliage or the surface of water; sometimes drops to the ground to pursue insect or small lizard. Often returns repeatedly to same perch after sallying, and sometimes bashes prey against perch prior to consumption. Sometimes preys on insects attracted to bright lights in more urban areas. Fruit taken by by hover-gleaning or perch-gleaning. Aggression towards bats (*Molossus molossus*) reported from Cuba, likely as feeding-territory defence.

Breeding. Laying from late May in N of range, from Apr in SE USA (Florida); Mar-Jul in West Indies; females in breeding condition Mar-May and male in May in Colombia; breeds mostly Apr-Jul, occasionally earlier, in Venezuela; sometimes double-brooded. In courtship display, partners cross one another as they ascend straight upwards or in spiralling flight, calling loudly and sometimes snapping bill. Nest cup-shaped, fairly loose and thin, sometimes rather crudely constructed and messy-looking, composed of coarse twigs, stems, vines and marsh grasses, sparse but not particularly soft lining of finer grasses, moss and/or rootlets, and sometimes hair or monofilament; one rather flat nest in Hispaniola had external diameter 24 cm, height 7 cm, internal diameter 8·5 cm, depth 3·5 cm deep; at variable height, generally c. 1-6 m, exceptionally up to 15·2 m (Abaco I), and typically in open and highly exposed setting in fork or saddled on top of horizontal tree branch at varying distance from trunk, in shrub, or sometimes on artificial structure such as telephone pole or lamppost; variety of tree species used, although mangroves seem to be preferred. Both sexes aggressively defend nesting territory against intruders and potential nest predators; very aggressive, regularly attacks mammals of varying sizes and much larger birds. Clutch 2-4 eggs (commonly 3), sometimes 5 (mean 3·25 in Florida, 2·8 in Puerto Rico); incubation period probably c. 14-15 days; chicks leave nest probably at c. 16-18 days, dependent on adults for 3-5 weeks after fledging. Parasitized infrequently, probably not successfully, by Shiny Cowbird (*Molothrus bonariensis*); presumably also by Brown-headed Cowbird (*M. ater*).
Movements. Largely resident from Hispaniola E through Lesser Antilles. Most populations of nominate migrate from Nov, winter mainly in C Panama (late Aug to late Apr) and N South America (mostly early Sept to Apr, rarely early May) from W & N Colombia (S to Valle, Huila and Meta; peak numbers mid-Sept to mid-Oct in Santa Marta) E to Venezuela (fairly common non-breeding visitor, mostly Sept-April, S to N Amazonas and N Bolívar); also, more irregularly, the Guianas and extreme N Brazil (Roraima). Some remain in coastal areas of SE USA and N South America. Transients uncommon to rare on E coast of Yucatán Peninsula and offshore islands from Quintana Roo to Belize in late Mar to Apr and Sept-Nov, probably also N Honduras. Numerous records of casual wanderers N & W of breeding range; single sighting in Ecuador (El Oro). Movements probably diurnal, and migratory flocks typically small, of fewer than 20 individuals.
Status and Conservation. Not globally threatened. Common; one of the commonest and most conspicuous species throughout West Indies; breeding in Venezuela only quite recently recorded, and species may be expanding range. Estimated global population 780,000 individuals. Impact of human activities on this species unclear; some, such as the opening-up of closed forest, may be beneficial, whereas others, e.g. pesticide use, hunting, collisions with vehicles and degradation of coastal habitats, adverse. In general, however, appears to be tolerant of human disturbance.
Bibliography. Anon. (1998a), Arendt (1992), Baicich & Harrison (1997), Barbour (1923, 1943), Bent (1942), Biaggi (1983), Birdsley (2002), Brodkorb (1950), Buden (1987a), Cory & Hellmayr (1927), Cruz & Andrews (1989), Davis (1941), DeGraaf & Rappole (1995), Emlen (1977), Faaborg (1985), Faaborg & Terborgh (1980), ffrench (1991), Fitzpatrick (1980a), García (1987), Garrido & Kirkconnell (2000), Gochfeld (1985), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes & Samad (2002), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Howell *et al.* (1992), Kaufman (1996), Keith (1997), Keith *et al.* (2003), Lee *et al.* (1996), Mobley (2002), Murphy (1989), Paynter (1995), Peterson (1947), Phelps & Phelps (1963), Phillips (1994a), Price *et al.* (1995), Raffaele *et al.* (1998), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Seutin & Apanius (1995), Sick (1993, 1997), Smith, G.A. & Jackson (2002), Smith, W.J. (1966), Snow (1985a), Soy (1997), Staicer *et al.* (1996), Stiles & Skutch (1989), Stotz *et al.* (1996), Thomas (1979a), Tostain *et al.* (1992), Udvardy (1963), Vaurie (1957a), Wetmore (1972), Wetmore & Swales (1931).

364. Loggerhead Kingbird

Tyrannus caudifasciatus

French: Tyran tête-police **German**: Olivgrauer Königstyrann **Spanish**: Tirano Guatíbere

Taxonomy. *Tyrannus caudifasciatus* d'Orbigny, 1839, Cuba.
Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions. Affinities of present species uncertain; probably closest to *T. cubensis*. Phylogenetic analyses indicate it is either basal to remainder of the ingroup (*Tyrannus* in this case) taxa, or basal to monophyletic "E & W species assemblage" that includes *T. vociferans*, *T. verticalis*, *T. tyrannus* and *T. forficatus*. Races based mainly on insular distribution, but species perhaps better treated as monotypic. Seven subspecies recognized.
Subspecies and Distribution.
T. c. bahamensis (H. Bryant, 1864) - N Bahamas (Grand Bahama, Abaco, Andros, New Providence).
T. c. caudifasciatus d'Orbigny, 1839 - Cuba (including several large cays in Sabana-Camagüey and Jardines de la Reina Archipelago).
T. c. flavescens Parkes, 1963 - I of Pines, off SW Cuba.
T. c. caymanensis (Nicoll, 1904) - Cayman Is.
T. c. jamaicensis (Chapman, 1892) - Jamaica.
T. c. gabbii (Lawrence, 1876) - Hispaniola.
T. c. taylori (P. L. Sclater, 1864) - Puerto Rico (including Vieques).



Descriptive notes. 23 cm. Has blackish head, yellow or pale orange semi-concealed coronal patch; upperparts mostly dark grey, some olive wash on back; wings mostly dark grey, prominent whitish margins on wing-coverts; tail blunt-ended, dark grey, buff-white terminal tips on rectrices; mostly white below, yellow wash on belly and crissum, yellow wash on axillaries; iris dark; bill long and fairly thick, black; legs black. Distinguished from *T. cubensis* mainly by proportionately smaller bill, more conspicuous whitish tail tips, more contrasting head and back. Sexes similar. Juvenile resembles adult, but with brownish wingbars, no crown patch. Races all very similar, differing mainly in amount of yellow wash in plumage, and pattern of tail tip. Voice. Most frequent call a loud, rolling and sputtering "teeerrp" or rising "pit-pit-pit-pit-pit-tirr-ri-ri-reee" chatter.
Habitat. Forests, mangroves and swamp edges.
Food and Feeding. Food primarily larger flying insects, captured by aerial hawking from an exposed perch; also preys on small lizards. Some fruit eaten.
Breeding. Mainly Feb-Jul, also occasionally Nov-Jan; Apr-Jul in Cuba. Nest cup-shaped, composed of twigs, rootlets and sometimes hair, no lining, usually placed in fork of horizontal branch high in tree. Clutch 2-3 eggs, sometimes 4. No other information.
Movements. Resident. Casual wanderer to SE USA (S Florida).
Status and Conservation. Not globally threatened. Common and widespread within range. Apparently from Little Cayman I in recent years. Occurs in several national parks and other protected areas, e.g. Güira National Park, in Cuba.
Bibliography. Anon. (1998a), Barbour (1943), Biaggi (1983), Birdsley (2002), Bond (1928a, 1985), Bradley (2000), Brudenell-Bruce (1975), Cory & Hellmayr (1927), Cruz (1993), Dod (1987), Emlen (1977), Faaborg (1985), Garrido & Kirkconnell (2000), Gundlach (1873), Johnston (1975), Mobley (2002), Parkes (1963), Phillips (1994a), Raffaele (1989), Raffaele *et al.* (1998, 2003), Ridgway (1907), Smith, P.W. *et al.* (2000), Smith, W.J. (1966), Stotz *et al.* (1996), Tossas & Delannoy (2001), Vaurie (1957a), Wetmore & Swales (1931), White (1998).

365. Giant Kingbird

Tyrannus cubensis

French: Tyran géant **German**: Riesenkönigstyrann **Spanish**: Tirano Cubano

Taxonomy. *Tyrannus cubensis* Richmond, 1898, Cuba.
Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions. Present species probably closest to *T. caudifasciatus*; further styudy required. Monotypic.
Distribution. Locally in Cuba and I of Pines (R Santa Fe).



Descriptive notes. 23-26 cm. Large kingbird with large and almost rounded, flat-looking head. Has blackish crown and nape, orange coronal patch (usually concealed); upperparts mostly dark grey; wings dusky grey; remiges and wing-coverts with narrow but prominent whitish or greyish-white margins; tail slightly notched, dusky, slightly darker than back, rectrices sometimes with pale tips; entirely white below, sometimes pale greyish wash across upper breast; iris dark brown; bill massive, with fairly arched culmen, black; legs blackish. Sexes alike. Juvenile is similar to adult, but lacking coronal patch. Voice. Loud, burry "tooe-tooe-tooee-tooee-toee" chatter, also a call of 4 distinct syllables; also unusual-sounding "antiphonal duet", whereby one member of pair, usually male, begins the song and partner joins in for final notes. Vocalizations often quite loud and far-reaching, sometimes audible over 1-1·5 km. During Feb, vocalizing usually occurs early, during period from c. 15-20 minutes before sunrise to 2-2·5 hours after.
Habitat. Tall lowland forest, especially pine (*Pinus*) forest, and wooded borders of rivers and swamps; also mixed pine barrens with some hardwood trees, open woodland with taller trees, and more open swamp and dry savanna with scattered *Ceiba* trees. Also observed to c. 400 m in cloudforest on serpentine soils in E (mountains SE of Moa); also along riparian corridors in valleys, especially in proximity of coconut palms and other large trees with exposed perches. Said to forage in trees and palms in relatively more open areas during dry season.
Food and Feeding. Appears to have fairly wide diet; feeds primarily on large flying insects (mainly hymenopterans), but also consumes considerable amounts of fruit during dry season; lizards (*Anolis*) and the fledglings and nestlings of other bird species occasionally taken. Usually in pairs at higher levels on an exposed perch in taller trees; compared with congeners seems rather sluggish, and often perches in an almost crouched position, with belly resting on perch. Hawks flying insect, possibly also sally-gleans insects; often tosses larger prey items into air for better orientation and ease of consumption. Fruit usually taken while hovering, occasionally in one location for extended period.
Breeding. Breeds Mar/Apr-Jun; eggs recorded in May. Nest cup-shaped, composed of roots, dried grasses and small twigs, no lining, usually placed high in fork of horizontal branch in large tree (usually, perhaps almost exclusively, *Ceiba pentandra*), once 6 m up in dead and leafless tree surrounded by human and livestock habitations but close to forested area with a stream; breeding territory large, mean 27·5 ha. Clutch 2-3 eggs. No other information.
Movements. Resident.
Status and Conservation. ENDANGERED. Overall population under 1000 birds. In May-Jun of 1999 and 2000, 27 nesting pairs found in Najasa Valley. Occurs naturally in low densities, but appears to be increasingly rare for some as yet unknown reason(s), probably related to habitat loss and degradation of existing habitat through logging and conversion to agriculture. Now extinct in two of the three island groups where it was historically known to occur. Existing populations in Cuba small and widely disjunct. E areas of Alejandro de Humboldt National Park, near Nuevo Mundo, may be a stronghold for the species in E Cuba. Recent records from Pinares de Mayarí; Monte de Regino (Havana province) and El Copey, NE of Caimito (Havana province); and the low-elevation cloudforest SE of Moa, near Trinidad (Sancti Spíritus province). Reported as common in pine forest during middle of 20th century.
Bibliography. Anon. (1998a), Barbour (1923, 1943), Birdsley (2002), Bond (1985), Buden (1987a), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cory & Hellmayr (1927), Eisenmann (1955), Faaborg (1985), Garrido & García (1975), Garrido & Kirkconnell (2000), Mobley (2002), Phillips (1994a), Raffaele *et al.* (1998, 2003), Regalado (2002), Ridgway (1907), Rompré *et al.* (2000), Salvin (1889), Smith, P.W. (2001), Smith, W.J. (1966), Stattersfield & Capper (2000), Stotz *et al.* (1996), Suárez (1998).

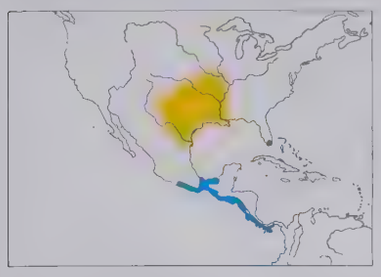
366. Scissor-tailed Flycatcher

Tyrannus forficatus

French: Tyran à longue queue **Spanish**: Tijereta Rosada
German: Scherenschwanz-Königstyrann
Other common names: Fork-tailed Flycatcher(!)

Taxonomy. *M[uscicapa] forficata* J. F. Gmelin, 1789, Mexico.
Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions. Present species long considered closest to *T. savana*, mainly due to tail-streamers, and both previously separated in subgenus *Muscivora* (and earlier in genus *Milvulus*); affinity not supported by molecular-sequence data. Phylogenetic analyses indicate clade including this species and *T. verticalis* within "E & W species group" that also includes *T. tyrannus* and perhaps *T. caudifasciatus* and/or *T. cubensis*. Monotypic.
Distribution. Breeds in SC USA (SE Colorado, S Nebraska and SW Missouri S to E New Mexico and W Louisiana) S to NE Mexico (N Coahuila, C Nuevo León, N Tamaulipas). Winters S Mexico

(Atlantic slope from S Veracruz to W Campeche, Pacific slope from Guerrero, and interior Chiapas), El Salvador, Honduras and Nicaragua S to C Costa Rica and rarely W Panama; also S Florida.



Descriptive notes. 19-38 cm including rectrices (c. 11 cm without); 39-40 g. Male has pale grey head, semi-concealed red coronal patch; upperparts mostly pale silvery or pearlescent grey to white, back and rump duller ash-grey with pink tinge; wings mostly dark brown or black, broad whitish edging on wing-coverts and secondaries; outer primaries attenuated (1-3 mm wide) for terminal 19-22 mm; tail deeply forked, mostly blackish, very long outer rectrices basally white or pinkish-white with extensive black terminal sections; mostly pale grey to white below, grey tinge on breast, pink-orange or salmon wash on lower underparts; considerable pink-orange or salmon wash on underwing-coverts, also reddish patch on axillaries (most prominent in flight, sometimes visible around bend of wing when perched); iris dark brown; bill blackish or dark brown, lighter at base, particularly on lower mandible; legs black or dull brown. Female duller overall, pink areas paler, shorter tail, crown patch reduced or absent, outer primaries attenuated for shorter length. Juvenile similar to female but even paler, with duller and more greyish-brown upperparts, paler pinkish wash below, smaller reddish patches on axillaries, little or no attenuation of outer primaries, lacks crown patch and has much shorter tail; adult-like plumage acquired through first winter, but tail remains relatively short in spring. VOICE. Common calls a sharp, dry and harsh "pik", "kip", bik" or "kek", repeated "kee-kee" or "ka-leep", more nasal "bik err", and variations of dry and buzzy chattering; male dawn song consists of varied number of "pup" calls followed by "perleep" or "peroo", also given during aerial display. Non-vocal sounds include dry rustling or wing-whirring heard from flying birds at close range (likely created by attenuated tips of outer primaries), and bill-snapping during aggressive encounters.

Habitat. Open to semi-open and arid to semi-arid brushy scrub and grassland or savanna with scattered trees, second-growth scrub, deciduous forest edge; towns, agricultural areas, pastures, golf courses and parks. More humid areas in winter. Mostly at low elevations, to c. 1500m; to 2300 m in Costa Rica.

Food and Feeding. Major food items include grasshoppers and crickets (Orthoptera), beetles (Coleoptera), hymenopterans, bugs (Hemiptera) and lepidopterans; occasionally flies (Diptera), arachnids, dragonflies (Odonata), mantids and phasmatids. Also somewhat frugivorous, large groups often gathering in trees to consume berries or arillate seeds during migration and in wintering areas. Mostly singly or in pairs during breeding, and in various-sized flocks during migration and on wintering grounds. Feeds primarily on flying insects caught on the wing, usually by aerial hawking from exposed perch (from ground level to 10 m up) in a tree, bush, utility wire or fence; often makes long (up to 60 m) and very graceful sallies in pursuit of prey. Also sally-gleans insects from vegetation, and occasionally directly from the ground, relatively more frequently than do congeners other kingbird species. Reported as foraging at night near streetlights. Drinking from puddles while perched on ground observed on several occasions.

Breeding. Mainly Apr-Aug, occasionally from Mar. Zigzag flight display; strong evidence of assortative mating by tail length reported. Nest a rather thick-rimmed open cup, sometimes with rough exterior and usually more tightly constructed core, composed primarily of coarse materials including plant stems and inflorescences (mostly of *Gnaphalium*), stolons of *Cynodon dactylon*, catkins, also incorporating wool, *Tilandsia usneoides*, *Lepidium*, bits of paper and cloth, string, cotton etc., sometimes with wet soil, caterpillar cocoons, strips of *Juniperus virginiana* bark, feathers, thistle down, even carpet fuzz; lining more tightly woven, of finer material; estimates of average outside diameter 12-15·2 cm, height 5·8-7 cm, inside diameter 7·6-8·2 cm, depth 4·2-5·1 cm; typically placed in fairly exposed situation, with some shading from foliage, at height of up to 8·2 m in small isolated tree or large shrub (at least 20 different tree and shrub species reported as nest-sites), or on utility pole, streetlight or other artificial structure, also sometimes in dead tree; sometimes nests in close proximity to other species, including congeners and even potential predators. Clutch usually 5 eggs, often 4, seldom 3 or 6; relays, rarely up to four times, if breeding attempt fails; incubation by female, period variable, 13-16 days in one study and 13-22 days in another, dependent on date of clutch initiation and weather conditions; chicks fed by both parents, nestling period 14-17 days. Parasitized rarely by Brown-headed Cowbird (*Molothrus ater*).

Movements. Migratory. Winters from SE USA (often small numbers in S Florida), NE, E & S Mexico (Sept-Apr) and Central America S to W Panama; present mainly early Nov to mid-April in Costa Rica, irregular winter visitor Nov-Mar in Panama. Transient migrants occur in E Mexico (Mar-May, Aug-Nov) mainly on Atlantic Slope N of Isthmus of Tehuantepec; uncommon in interior in spring, vagrant in W (mainly Oct-Apr) and in Yucatán Peninsula and Belize(Oct-May). Vagrants also occur in West Indies (late Oct to Dec); abundant records of casual wanderers from numerous localities throughout much of North America. Often roosts in large flocks, often with smaller numbers of other species, during migration and in wintering areas.

Status and Conservation. Not globally threatened. Uncommon to common. Estimated global population 7,900,000 individuals. No apparent overall trend for USA 1966-1994, but significant declines in Oklahoma, Kansas and Arkansas. Variation in abundance between years may be due to predation and adverse weather, e.g. thunderstorms and tornados. Impact of human activities unclear; forest degradation probably beneficial, but offset by pesticide use, collisions with vehicles, and removal of nest-sites in mesquite (*Prosopis*) brush; in general, appears to be tolerant of human disturbance.

Bibliography. Anon. (1998a), Arendt (1992), Baicich & Harrison (1997), Bent (1942), Birdsley (2002), Contreras (1997), Cory & Hellmayr (1927), Davis & Webster (1970), DeGraaf & Rappole (1995), Fitch (1950), Fitzpatrick (1980a), García *et al.* (1997), Garrido & Kirkconnell (2000), González-Guzmán & Mehlman (2001), Howell & Webb (1995a), Johnsgard (1979), Kaufman (1996), McGowan & Spahn (2004), Mobley (2002), Monroe (1968), Nice (1931), Nolte & Fulbright (1996), Ortiz-Pulido (1997), Peer & Sealy (2000), Peterjohn *et al.* (1995), Phillips (1994a), Price *et al.* (1995), Raffaele *et al.* (1998), Regosin (1998), Regosin & Pruett-Jones (2001), Ridgely & Gwynne (1989), Ridgway (1907), Root (1988), Sauer & Droege (1992), Sibley & Ahlquist (1985c), Slud (1964), Smith (1966), Stiles & Skutch (1989), Stotz *et al.* (1996), Taylor (1946), Traylor (1977), Traylor & Fitzpatrick (1982), Wetmore (1972).

367. Fork-tailed Flycatcher

Tyrannus savana

French: Tyran des savanes **German**: Gabelschwanz-Königstyrann **Spanish**: Tijereta Sabanera

Taxonomy. *Tyrannus savana* Vieillot, 1808, Surinam.

Closest relatives of genus may be *Empidonomus* and *Tyrannopsis*; recent molecular-sequence data indicate present genus is monophyletic and sister-group to clade that includes *Empidonomus* and *Griseotyrannus*; two main clades within genus, loosely corresponding to "tropical species assemblage" and combination of "W" & "E" species groups of earlier authors, but with some exceptions. Present species long considered closest relative of *T. forficatus*, mainly due to tail-streamers, and both previously separated in subgenus *Muscivora* (and earlier in genus *Milvulus*); affinity not supported by molecular-sequence data. Phylogenetic analyses suggest that it belongs to a clade within the "tropical species assemblage" that also includes *T. albogularis* and *T. couchii*, although relationships among these three species remain uncertain. Four subspecies currently recognized.

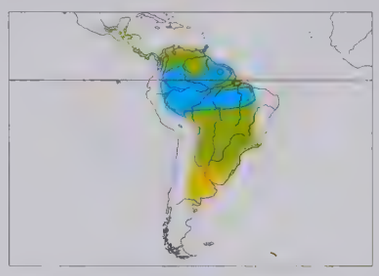
Subspecies Distribution.

T. s. monachus Hartlaub, 1844 - S Mexico (C & S Veracruz, N Oaxaca, NE Chiapas, Tabasco, SW Campeche) S to Colombia (except N, but generally E of Andes S to Meta and Vichada) and much of Venezuela (E to Orinoco Delta, S to N Amazonas and N Bolívar, and several offshore islands); also S Surinam (Sipaliwini) and NC Brazil (Roraima, lower R Negro, perhaps Amapá).

T. s. sanctaemartae (J. T. Zimmer, 1937) - N Colombia (Caribbean coastal region and Santa Marta Mts area) and extreme NW Venezuela (NW Zulia).

T. s. circumdatus (J. T. Zimmer, 1937) - N Brazil in E Amazonas (occasionally W to Manaus) and Pará and Amapá (S bank R Amazonas, islands near Santarém, and both banks of R Tapajós).

T. s. savana Vieillot, 1808 - C, S & SE Brazil (Rondônia and S Mato Grosso E to Tocantins and S Piauí, S to Mato Grosso do Sul, Minas Gerais, Rio de Janerio and Rio Grande do Sul), N & E Boliva, Paraguay, Argentina (S to Río Negro, occasionally to NE Chubut and even Patagonia) and Uruguay.



Descriptive notes. Male 37-40·5 cm, female 28-30 cm (both including tail); 28 g (*monachus*), 31·5 g (*savana*). Male nominate has most of head and upper nape black (looks black-capped), large semi-concealed yellow coronal patch; upperparts grey, uppertail-coverts black; wings blackish-brown, wing-coverts and secondaries edged pale grey to whitish; tips of outer 2-4 primaries deeply attenuated; tail black, extremely elongated outer rectrices (20-29 cm) basally edged white, outermost rectrices sometimes curving inwards and with slightly twisted tips; entirely white below, underwing-coverts whitish; iris dark; bill and legs blackish. Female generally duller, with shorter tail (elongated outer rectrices c. 14-16 cm), less attenuated outer primaries. Juvenile similar to adult but duller overall, with tail much shorter, head sooty grey, back more brownish, pale cinnamon margins on upper-tail-coverts and wing-coverts, little or no attenuation of outer primaries. Race *circumdatus* is very like nominate; *monachus* has paler grey back, outer primaries deeply notched and with wide tips; *sanctaemartae* differs from previous in having outer primaries almost non-emarginated and with blunt tips. VOICE. Generally rather quiet, even during breeding; thin, low-pitched, weak, rather creaky-sounding "tic", "jek", "tzig" or "jiit" call, sometimes in rapid series and especially in flight; sometimes lower, more emphatic "ek-ek-ek-ek-ek-ek"; also a sharp and slightly liquid "sik" or "plik", as well as various sharp, dry, and clicking or buzzy and rapid chattering notes; alarm an explosive high "jeek" or "dzeep". Male "tzig-tzig-zizizizizi ag ag ag ag ag ag" during aerial display; sometimes also a dry, rattling wing sound, especially from male in courtship display.

Habitat. Open terrain, especially pastures or savanna with scattered trees and bushes; also lawns, residential areas, mangroves, river islands, and along rivers in heavily forested areas; also reedbeds, alders (*Alnus*) and other tall vegetation near water. Can occur in wide variety of habitats during migration, including canopy of tall humid forest. Mostly below 1000 m; transients recorded to 2400 m in highlands of Central America, and in Andes at 2500-3100 m (and to 4100 m in C Peru).

Food and Feeding. Primarily flying insects; considerable quantities of berries and palm fruits also taken outside breeding season. May be observed singly, in pairs or in small family groups; also large flocks during migration and in non-breeding season. Usually perches at lower levels (often 1 m or below) on top of bushes, shrubs, small trees, also fence rows and telephone wires. Insects caught on the wing, usually by aerial hawking from an exposed perch; occasionally catches prey on or close to the ground or water, and frequently makes long and sometimes acrobatic upward sallies in pursuit of prey. Occasionally drops to ground in pursuit of insects. Berries and fruits taken by hover-gleaning or while clinging to cluster of fruits.

Breeding. Breeds Mar-Jun in Costa Rica; Jan-May in Colombia; nests found in Oct in Venezuela (W Apure); Oct-Jan in Argentina. Male display includes spiral flight while calling. Nest a shallow cup composed of plant fibres and leaves, lined with seed down, two in Argentina with external diameter 8-10·5 cm, height 7-9 cm, internal diameter 7-5 cm, depth 5-4 cm; usually placed 1-10 m up in tree or shrub. Clutch 2-3 eggs; incubation period 14-17 days; fledging period 13-16 days. Parasitized by Shiny Cowbird (*Molothrus bonariensis*).

Movements. Resident, nomadic, and partially migratory; migratory in S of range. Movements throughout much of this species' wide range require clarification. N populations resident, with some nomadic and local movements; those farther S in Central America are partially migratory, some reaching N South America (irregular in Venezuela throughout year, some possibly breeding) as far S as N Brazil (Oct-Mar). May be resident in N & W Colombia. S race (nominate) migratory, moving N to N Argentina and S Brazil; present from Mar-Sept/Oct throughout much of Amazonia and throughout the continent to N South America, but primarily E of Andes (perhaps mixed with *monachus* in E Colombia, with peak numbers Nov-Mar), to N coast of Colombia; recorded in E Ecuador from Feb/Mar to Sept; in Venezuela peak numbers late Sept and Mar to mid-Oct, a few groups arriving by first week Feb; also occurs in the Guianas, Trinidad and Tobago. Vagrants casually along Atlantic coast of North America and accidentally inland to upper Midwest and Texas; records of vagrants or overshooting austral migrants from Mexico, N Central America and West Indies, W Ecuador, and coastal areas of Peru and N Chile, also at high altitude in Andes; also casual visitor to Falkland Is. Especially gregarious during migration, large and fairly loose flocks moving at rather high altitudes and often gathering in groups of as many as 5000-10,000 or more to roost at semi-regular spots (e.g. Caroni Swamp, in Trinidad); often mixes with larger numbers of *T. tyrannus*.

Status and Conservation. Not globally threatened. Locally common. Widespread within large range. This species' nomadic nature, coupled with its ability to thrive in a wide range of open habitats with trees, should ensure its survival. Occurs in numerous national parks and other protected areas.

Bibliography. Anon. (1998a), Babarskas *et al.* (2003), Barrows (1883), Bent (1942), Birdsley (2002), Canevari *et al.* (1991), Cavalcanti (1988), Chesser (1997), Cintra (1997), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Couve & Vidal-Ojeda (2003), Cruz & Andrews (1989), Di Giacomo (2004), Faaborg & Terborgh (1980), ffrench (1991), Fitzpatrick (1985a), Fjeldså & Krabbe (1990), Friedman & Smith (1950), Guix (1995), Haffer (1975), Harris (1998), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hilty (2003), Hilty & Brown (1986), Hinojosa *et al.* (1998), Howell & Webb (1995a), Irestedt *et al.* (2001), Johansson *et al.* (2002), Joseph (1996), Kaufman (1996), Keith (1997), Klimaitis & Moschione (1987), Lee Jones (2004), Lockwood (1999), López *et al.* (1989), Lowen *et al.* (1996), Mason (1985), Meyer de Schauensee (1948), Mezquida (2002), Miller (1947), Miserendino (1998), Mlodinow & O'Brien (1996), Mobley (2002), Monroe (1968), Narosky & Salvador (1998), Oren & Parker (1997), Pearson (1980), de la Peña (1987, 1988, 1995), Phillips (1994a), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), do Rosário (1996), Sclater & Salvin (1879), Short (1975), Sibley & Ahlquist (1985c), Sick (1993, 1997), da Silva *et al.* (1997), Slud (1964), Smith (1966), Stiles & Skutch (1989), Stotz *et al.* (1996), Traylor (1977), Wetmore (1972), Zimmer (1937b).



Tribe ATTILINI

Genus *RHYTIPTERNA* Reichenbach, 1850

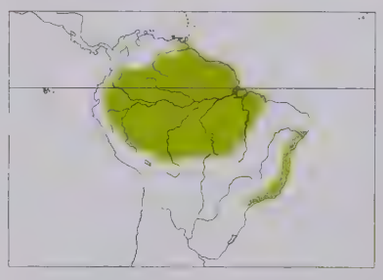
368. Greyish Mourner

Rhytipterna simplex

French: Tyran grisâtre **German**: Grauschmucktyrann **Spanish**: Plañidera Gris

Taxonomy. *M[uscicapa] simplex* M. H. K. Lichtenstein, 1823, Bahia, Brazil.
Placed by early authors in the family Cotingidae, with supposed close relationship to genera *Laniocera* and *Lipaugus*. Well-supported anatomical evidence, however, indicates that it is a tyrannid, having close affinities to *Sirystes*, *Casiornis* and *Myiarchus*. Two subspecies currently recognized.
Subspecies and Distribution.
R. s. frederici (Bangs & T. E. Penard, 1918) - SE Colombia (S from Meta and Vaupés), E & S Venezuela and the Guianas S to E Ecuador, E Peru, Amazonian Brazil (S to Mato Grosso, N Goiás and N Maranhão) and N Bolivia (S to La Paz, Cochabamba and N Santa Cruz).

R. s. simplex (M. H. K. Lichtenstein, 1823) - E Brazil, from Alagoas S to Minas Gerais and SW São Paulo.



Descriptive notes. 19·5-20·5 cm; 33-38 g. Has plain grey head and upperparts, suggestion of crest on rear crown; wings and tail tinged brownish; underparts slightly paler, light grey on throat, faint yellowish-green tinge on belly; iris dark red to reddish-brown; bill slightly hooked at tip, black, often pink basally; legs black. Distinguished from remarkably similar Screaming Piha (*Lipaugus vociferans*) by smaller size, somewhat paler plumage, redder eyes. Female and presumed immature have some fulvous edging on wing and tail feathers. Race *frederici* is similar to nominate but darker above and on breast. Voice. Loud, fast "r-t-t-t-t-t-t-tchew", sometimes repeated several times in succession or given with 2-3 emphasized notes at end; also a slowly ascending series of clear, whistled "whew" notes.
Habitat. Inhabits middle and upper strata of *terra firme* humid forest, occasionally in transitional forest. Most common below 800 m, but recorded up to 1000 m in SE Peru, and to 1300 m in Venezuela.

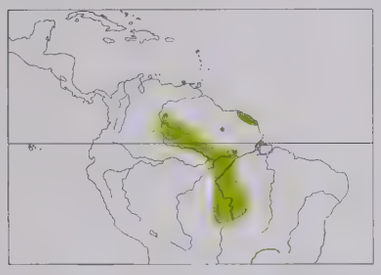
Food and Feeding. Feeds on large insects, also some fruit. Analysis of 19 prey items taken from stomachs in SE Peru, included: Homptera (cicadas 32%); Coleoptera (32%); Orthoptera (16%); Hymenoptera (ants 11%); Lepidoptera (5%); and Dermaptera (4%). Alone, in pairs, or in small group; regularly accompanies mixed flocks. Perches erect, quietly, while peering around in search of prey; then makes sudden sallies to hover-glean from foliage and branches.
Breeding. Male in breeding condition in Aug in Colombia; enlarged gonads Aug-Nov in SE Peru. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Given that much of its habitat remains in relatively pristine condition within its large range, it is not likely to be at any risk. Occurs in many national parks and other protected areas. Status of nominate race in E Brazil, where much forest already destroyed, requires investigation.
Bibliography. Bates & Parker (1998), Begazo (1995), Blake (1950, 1962), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Dubs (1992), Friedmann (1948), Gilliard (1941), Haffer (1974), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon, W.E. (1982b, 1985), Lanyon, W.E. & Fitzpatrick (1983), Lanyon, W.E. & Fry (1973), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Naka (2004), Oren & Parker (1997), Peres & Whittaker (1991), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Schubart *et al.* (1965), Schulenberg *et al.* (2001), Sick (1993, 1997), Silveira *et al.* (2003), Snow, D.W. (1973b), Snyder (1966), Stotz *et al.* (1996), Terborgh *et al.* (1984), Thiollay & Jullien (1998), Tostain *et al.* (1992), Traylor (1977), Traylor & Fitzpatrick (1982), Zimmer (1936a).

369. **Pale-bellied Mourner**

Rhytipterna immunda

French: Tyran à ventre pâle **German**: Hellbauch-Schmucktyrann **Spanish**: Plañidera Pálida

Taxonomy. *Lipaugus immundus* P. L. Sclater and Salvin, 1873, "Oyapoc, Cayenne".
Placed by early authors in the family Cotingidae, with supposed close relationship to genera *Laniocera* and *Lipaugus*. Well-supported anatomical evidence, however, indicates that it is a tyrannid, having close affinities to *Sirystes*, *Casiornis* and *Myiarchus*. Monotypic.
Distribution. Extreme E Colombia, SW Venezuela and Amazonian Brazil (from upper R Negro drainage E to Manaus area, S to Mato Grosso); also S Guyana, Surinam, French Guiana and adjacent NE Brazil (N Amapá).



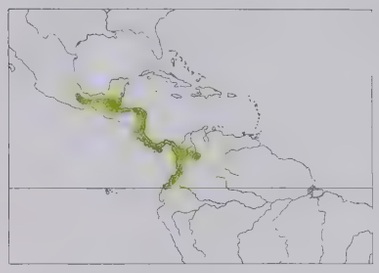
Descriptive notes. 18·5-19 cm; 28 g. Head and upperparts are dull greyish olive-brown, crown slightly darker; wings duskier, two indistinct pale greyish wingbars, rufous edging on primaries; uppertail-coverts and tail with more brown, rectrices edged rufous, pale edging on outermost pair; greyish below, pale dingy yellowish on belly, flanks tinged rusty; iris brown; bill slightly hooked, blackish, rictal bristles prominent; legs blackish. Differs from rather similar *Myiarchus* species in having rusty flanks, greyer and more rounder head, larger eye. Sexes similar. Voice. Most common call, given at intervals throughout day, a distinctive "pur-treeép, cheeeuu" or "puu-puu-trreeép, cheeeuu" with loud ringing quality; also plaintive "pueeeer"; male infrequently gives leisurely dawn song, "cheeuu purreeéyp cheeuu purreeéyp" and so on.
Habitat. Savanna woodland and borders on sandy soil, scrubby low-canopied *várzea* woodland, and *campinas*; below 300 m.
Food and Feeding. Feeds on insects and some fruit, but not much known. Often perches within 5 m of ground, occasionally much higher. Peers about slowly, searching for prey, and regularly makes short sallies to hover-glean from foliage. Sometimes joins mixed-species flocks.
Breeding. Nothing recorded.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare to uncommon and very local; possibly more common, often overlooked. Fairly common at Junglaven Lodge (Amazonas), in Venezuela, and near Powaka and Zanderij, in Surinam. Also occurs at Alechiven Lodge at mouth of R Ventuari, in Venezuela, and in Jaú National Park, in Brazil. The white-sand savanna-like habitat occupied by this species is widespread, and has so far been protected from human exploitation because the soils do not support agriculture.
Bibliography. Cavalcanti (1988), Cory & Hellmayr (1927), Dubs (1992), Forrester (1993), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon, W.E. (1982b, 1985), Lanyon, W.E. & Fitzpatrick (1983), Lanyon, W.E. & Fry (1973), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Ridgely & Tudor (1994), Sick (1993, 1997), Snow, D.W. (1973b), Stotz *et al.* (1996), Tostain *et al.* (1992), Traylor (1977), Zimmer & Hilty (1997).

370. **Rufous Mourner**

Rhytipterna holerythra

French: Tyran plaintif **German**: Zimtschmucktyrann **Spanish**: Plañidera Rojiza

Taxonomy. *Lipaugus holerythrus* P. L. Sclater and Salvin, 1860, Choctum, Verpaz, Guatemala.
Placed by early authors in the family Cotingidae, with supposed close relationship to genera *Laniocera* and *Lipaugus*. Well-supported anatomical evidence, however, indicates that it is a tyrannid, having close affinities to *Sirystes*, *Casiornis* and *Myiarchus*. Two subspecies recognized.
Subspecies and Distribution.
R. h. holerythra (P. L. Sclater & Salvin, 1860) - Atlantic slope from S Mexico (N Oaxaca) S to Panama and N Colombia (E to Santander).
R. h. rosenbergi (Hartert, 1905) - Pacific lowlands of W Colombia (S from S Chocó) and NW Ecuador (Esmeraldas).
Descriptive notes. 19·5-21 cm; 36-40 g. Entire plumage is essentially rufous; cinnamon-brown to russet above, crown darker rufous than back; remiges darker brown, broadly edged cinnamon-rufous, contrasting with dusky-tipped primary coverts; tail brighter, more cinnamon-rufous, with darker central feathers; underparts bright cinnamon to ochraceous tawny, often darker with brownish wash on breast; iris dark brown; bill hooked at tip, blackish, base of lower mandible flesh-coloured; legs greyish. Distinguished from superficially very similar but unrelated Rufous Piha (*Lipaugus unirufus*) by smaller size, smaller bill, slightly darker underparts. Sexes similar. Juvenile resembles adult, but perhaps somewhat brighter. Race *rosenbergi* is darker rufous overall than nominate. Voice. Calls include a clear mournful whistle, "wheeeip, wheeeer", and somewhat livelier "wheee-per, wheeéur".



Habitat. Humid evergreen forest and mature secondary woodland, much less often at forest edge; mid-levels and subcanopy. Typically to 1000 m; to 1200 m in Costa Rica.
Food and Feeding. Feeds on large slow-moving insects such as katydids (Tettigoniidae), stick-insects (Phasmida) and caterpillars; also berries and arillate seeds. Often with mixed-species flocks, but also forages alone or in pairs. Lethargic and inconspicuous. Sits for considerable periods on perch; typically hunches far forward while raising its tail; sometimes twists head at odd angles while scanning for prey. Makes sudden sally to snatch prey from foliage; also plucks berries and seeds while in flight.
Breeding. Season Mar-Jun in Costa Rica and Feb-May in Colombia. Nests in tree cavity, usually old woodpecker (Picidae) hole, possibly hole in bank. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally common; perhaps overlooked. Apparently more common in N part of range. Probably locally extinct wherever deforestation has been intense, e.g. in lowlands of Chiriquí (Panama). Occurs in Río Bravo Conservation and Management Area, Columbia River Forest Reserve and Lamanai Archaeological Reserve, in Belize, Laguna del Tigre National Park, in Guatemala, Rancho Naturalista, Tarcol Lodge, Río Negro Jaguar Reserve and Tapantí National Park, all in Costa Rica, and "Jardin Tropical" (near Esmeraldas), Río Palenque Science Centre and Tinalandia Private Reserve (W Pichincha), all in Ecuador.
Bibliography. Anon. (1998a), Binford (1989), Cory & Hellmayr (1927), Cracraft (1985), González-García (1993), Haffer (1974, 1975), Hilty & Brown (1986), Howell & Webb (1995a), Jahn & Mena (2002d), Land (1970), Lanyon, W.E. (1982b, 1985), Lanyon, W.E. & Fitzpatrick (1983), Lanyon, W.E. & Fry (1973), Lee Jones (2004), Lowery & Dalquest (1951), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), Smithe (1966), Snow, D.W. (1973b), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Strewe (2000b), Traylor (1977), Wetmore (1972).

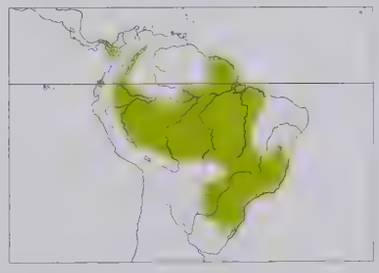
Genus *SIRYSTES* Cabanis & Heine, 1859

371. **Sirystes**

Sirystes sibilator

French: Tyran siffleur **German**: Grauschopftyrann **Spanish**: Mosquero Silbador
Other common names: Eastern Sirystes (races E of Andes); Western Sirystes (*albogriseus*)

Taxonomy. *Muscicapa sibilator* Vieillot, 1818, Río Plata, Paraguay.
Affinities obscure. Placed by early authors in the family Cotingidae, but internal morphology (syrinx, nasal capsule) and nesting behaviour indicate that it is allied with "myiarchine" flycatchers in the genera *Rhytipterna*, *Casiornis* and *Myiarchus*. Race *albogriseus* sometimes treated as a separate species, differing in plumage and vocalizations. Five subspecies recognized.
Subspecies and Distribution.
S. s. albogriseus (Lawrence, 1863) - E Panama; NW Colombia (Chocó, E Antioquia, Córdoba) and NW Ecuador (locally in W Esmeraldas, S Pichincha and N Manabí).
S. s. albocinereus P. L. Sclater & Salvin, 1880 - SW Venezuela (W Barinas, Táchira), E Colombia (locally to near base of Andes), E Ecuador, E Peru, W Brazil and N Bolivia (S to La Paz, Cochabamba and N Santa Cruz).
S. s. subcanescens Todd, 1920 - Surinam, French Guiana and E Amazonian Brazil (E to Maranhão, S to Mato Grosso and N Goiás).
S. s. atimastus Oberholser, 1902 - Chapada, in Mato Grosso (Brazil).
S. s. sibilator (Vieillot, 1818) - E & SE Brazil (Goiás and Bahia S to Rio Grande do Sul), E Paraguay (E from Amambay and Paraguarí) and NE Argentina (Misiones, NE Corrientes).



Descriptive notes. 18-18·5 cm; 27·5-36 g. Nominate race has black crown with slight crest, becoming slate-grey on side of head; back mottled olivaceous grey; wings blackish, wing-coverts and inner flight-feathers broadly edged grey; tail long, square, blackish; throat and breast grey, becoming greyish-white on belly; iris dark reddish-brown; bill black; legs blackish. Sexes alike. Juvenile has faint buffy wash throughout. Race *albogriseus* is paler above and below than nominate, has white rump and underparts, two broad white wingbars, white wing edgings, bold white tip on tail; *albocinereus* also has wider area of pure white on rump, but black wings with only narrow white edging, also whiter below; *subcanescens* is similar to nominate but with whitish rump (not so wide as on previous); *atimastus* like nominate, but more extensive yellowish feather tips on rump, pale ashy throat, rest of underparts white. Voice. E of Andes loud ringing "wheer-péw", sometimes lengthened into excited-sounding series, "wheer-pe-pe-pew-pew-péw"; W of Andes a series of huskier notes, "chup-chup-chup" or "prip-prip-prip", sometimes accelerating into chatter.
Habitat. Canopy of forest and mature secondary woodland; frequent in *várzea* and riparian forest in W Amazonia. To c. 1000 m.

On following page: 372. Rufous Casiornis (*Casiornis rufus*); 373. Ash-throated Casiornis (*Casiornis fuscus*).

Food and Feeding. Feeds on fairly large insects; fruits also taken. Often in pairs; follows mixed flocks in forest canopy. Perches in treetops in forward-leaning posture, much like *Myiarchus*; also nods head and raises crown feathers. Frequently hover-gleans or strikes vegetation with downward sallies for prey and small fruits. Seems to forage or wander over large areas.
Breeding. Active nest thought to contain well-developed nestlings in early Oct in SE Peru (Madre de Dios); birds reported in breeding condition in Feb in Panama and Colombia. Peruvian nest was in cavity estimated to be 32 m above ground at base of perpendicular "elbow" in limb of *Calicophyllum* tree, the hole (created from limb breakage, not excavated) running roughly horizontally into main branch; both members of pair seen to attend nest, and to bring insects captured up to 200 m away; intervals between visits averaged 8·6 minutes. No other information.
Movements. Mostly resident; possibly migratory in extreme S Brazil, but seemingly resident in neighbouring E Paraguay.
Status and Conservation. Not globally threatened. Uncommon to fairly common; locally common. In Panama, numerous along Pipeline road in Canal area. Perhaps most abundant in E Paraguay and Brazil where intact forest (especially *várzea* and riparian forest) remains. Race *albogriseus* is red-listed in Ecuador, where it is uncommon and local (perhaps often overlooked), but was reported as common at Limoncocha, near Colombian border. Much of the species' habitat remains in relatively pristine condition within its large range. Occurs in many national parks and other protected areas.
Bibliography. Anon. (1998a), Brooks *et al.* (1993), Canevari *et al.* (1991), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Cracraft (1985), Darrieu (1987), Fitzpatrick (1980c), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Jahn & Mena (2002e), Lanyon, W.E. (1982b, 1984a, 1985), Lanyon, W.E. & Fitzpatrick (1983), Lowen *et al.* (1996), Meyer de Schauensee (1970), Meyer de Schauensee & Phelps (1978), Narosky & Salvador (1998), de la Peña (1988), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), do Rosário (1996), Sick (1993, 1997), Snow, D.W. (1973b), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992), Traylor (1977), Zimmer (1937b).

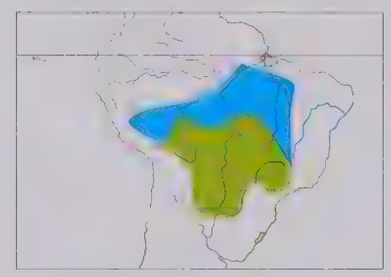
Genus *CASIORNIS* Des Murs, 1856

372. Rufous Casiornis

Casiornis rufus

French: Casiorne roux **German**: Zimtrücken-Röteltyrann **Spanish**: Burlisto Castaño

Taxonomy. *Thamnophilus rufus* Vieillot, 1816, Río Plata, Paraguay.
Considered by early authors to belong in the family Cotingidae, but now considered to be allied with the "myiarchine" flycatchers in genera *Rhytipterna*, *Sirystes* and *Myiarchus*. Sometimes treated as conspecific with *C. fuscus*. Monotypic.
Distribution. N & E Bolivia (SE from Beni and La Paz), SC Brazil (S Mato Grosso E to N Goiás and C Minas Gerais, S to Mato Grosso do Sul and São Paulo), Paraguay and N Argentina (S to Tucumán, E Chaco and N Corrientes); also small numbers N to NE Brazil (Maranhão, S Amapá) and W to SE Peru (N to Junín at R Ene) during austral winter.



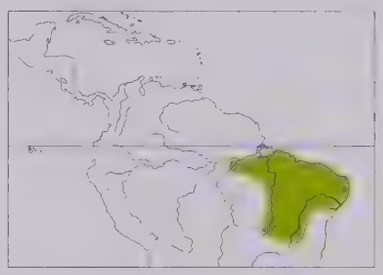
Descriptive notes. 18 cm; 22-27 g. Plumage is uniform rufous above, somewhat duller on back; throat and breast cinnamon, whitish tinge on mid-throat, belly pale buffy yellowish; iris dark brown; bill dark with fleshy-pink base; legs blackish-grey. Distinguished from similar *C. fuscus* by more uniform rufous above, brighter cinnamon breast, slightly less yellow on belly. Sexes alike. Voice. Surprisingly quiet; sometimes brief, weak "psee" note, occasionally extended into short series.
Habitat. Deciduous and gallery woodland, more heavily wooded *cerrado*, Chaco woodland and scrub; also riparian woodlands and thickets in non-breeding season. Mostly below 1500 m; occasionally in arid inter-montane valleys to 2000-2500 m locally in Bolivia.
Food and Feeding. Perches erect and alert, with crown feathers often raised into bushy crest; sometimes nods head in manner of *Myiarchus*. No other published information; probably sallies for insects.
Breeding. Breeding dates unpublished. Two nests in tree cavity, c. 1·2 and 1·5 m above ground. No other information.
Movements. Little information. Records from Peru and across C Brazil N to Amazon probably relate to austral migrants.
Status and Conservation. Not globally threatened. Fairly common. Much of this species' preferred habitat has been converted for agricultural use and eucalypt (*Eucalyptus*) and pine (*Pinus*) plantations, often encouraged by government incentives. By 1993, two-thirds of *cerrado* region in C Brazil had been heavily or moderately altered; outside protected areas few undisturbed tracts remain, and these could soon be degraded by spreading fires and overgrazing, or could disappear completely through agricultural conversion. Potential effects on this species, however, are little known. Occurs in several national parks and a number of other reserves, both in known breeding range and in non-breeding areas.
Bibliography. Allen (1995), Bates & Parker (1998), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Davis (1993), Di Giacomo (2004), Dubs (1992), Fjeldså & Maijer (1996), Hayes (1995), Joseph (1996), Lanyon, W.E. (1982b, 1984a, 1985), Lanyon, W.E. & Fitzpatrick (1983), López (1997), Lowen *et al.* (1996), Meyer de Schauensee (1982), Miserendino (1998), Narosky & Yzurieta (1993), de la Peña (1988), Perry *et al.* (1997), Ridgely & Tudor (1994), Ridgway (1907), Short (1975), Sick (1993, 1997), Snow, D.W. (1973b), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Terborgh *et al.* (1984), Traylor (1977), Willis & Oniki (1990).

373. Ash-throated Casiornis

Casiornis fuscus

French: Casiorne à dos brun **German**: Braunrücken-Röteltyrann **Spanish**: Burlisto Gorgigrís

Taxonomy. *Casiornis fusca* P. L. Sclater and Salvin, 1873, Bahia, Brazil.
Considered by early authors to belong in the family Cotingidae, but now considered to be allied with the "myiarchine" flycatchers in genera *Rhytipterna*, *Sirystes* and *Myiarchus*. Sometimes treated as conspecific with *C. rufus*. Monotypic.
Distribution. NE Brazil S of Amazon, from lower R Tapajós E locally to Bélem area and to Paraíba and Pernambuco, and S to NE Mato Grosso (upper R Xingu drainage), N Goiás and NW Minas Gerais.



Descriptive notes. 18 cm; 19·5 g. Plumage is largely rufous above, becoming dull sandy brown on back; wings dusky, broadly edged with rufous to buff, more rufous on shoulders; tail rufous; throat pale greyish, becoming greyish-fawn on breast and pale creamy yellowish on belly; iris dark brown; bill dark, base flesh-pink; legs blackish. Distinguished from similar *C. rufus* by less uniform rufous coloration above, browner back, more dull greyish breast, slightly yellower belly. Sexes alike. Voice. No information.
Habitat. *Caatinga* woodland and more heavily wooded *cerrado*; also *campina* vegetation in lower Amazon region. Recorded up to c. 500 m.
Food and Feeding. Perches erect and alert, with crown feathers often raised into bushy crest. No other published information; probably sallies for insects.
Breeding. No published information.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Not well known. Both *caatinga* and wooded *cerrado* subject to increasing human pressure, especially since roads were built in NE Brazil 30 years ago; these habitats are increasingly used for timber and cattle grazing, and are converted for agriculture and tree plantations; uncontrolled fires a problem. Recorded in Cavernas do Peruaçu National Park, in Minas Gerais.
Bibliography. Cory & Hellmayr (1927), Dubs (1992), Forrester (1993), Haffer (1974), Lanyon, W.E. (1982b, 1984a, 1985), Lanyon, W.E. & Fitzpatrick (1983), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Ridgway (1907), Sick (1993, 1997), Snow, D.W. (1973b), Stotz *et al.* (1996), Traylor (1977), Willis & Oniki (1991).

PLATE 44 ➤



PLATE 44

inches 3
cm 8

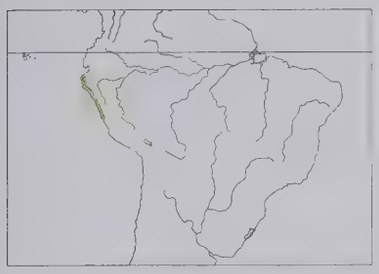
Genus *MYIARCHUS* Cabanis, 1844

374. Rufous Flycatcher

Myiarchus semirufus

French: Tyran roux **German**: Rötelschopftyrann **Spanish**: Copetón Rufo
Other common names: Seaboard Flycatcher

Taxonomy. *Myiarchus semirufus* P. L. Sclater and Salvin, 1878, Pacasmayo, Peru.
Phylogenetic analysis of mitochondrial DNA suggests that this species is either the sister to all others of genus or more closely allied to *Rhytipterna*; in morphology and mtDNA, it is as divergent from present congeners as they are from outgroup taxa. Retention in monotypic *Muscifur* as a subgenus considered not inappropriate. Monotypic.
Distribution. NW Peru, from Tumbes S in narrow coastal zone (generally less than 50 km wide) to near R Pativilca, 200 km N of Lima.



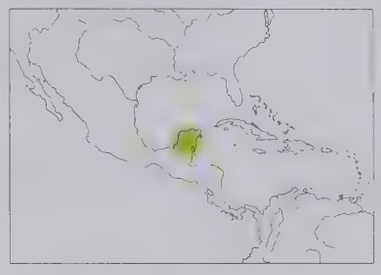
Descriptive notes. 17-19 cm; male 21·7-24 g, female 21-25 g. Distinctive, with plumage predominantly three shades of rufous and brown with no grey or yellow. Head and upperparts brown, rufous uppertail-coverts; throat and underparts nearly uniform light cinnamon-rufous, tending slightly darker on undertail-coverts and tibia, and lighter on chin; brown of upperparts sometimes extends on to side of breast; wings and tail predominantly rufous, lighter and not so rich on wings, wing-coverts mostly rufous but with brown variously on proximal parts of feathers or on inner webs, primary coverts contrastingly darker brown; outer rectrices wholly rufous-brown, remainder with outer webs dark rufous and inner webs dark chocolate-brown with thin outer margin of rufous; underwing-coverts rufous; iris, bill and legs dark; mouth-lining pale orange-yellow. Sexes alike. Juvenile resembles adult. Voice. Dawn song consists of alternated "huit" notes and rasping whistles with a more complex phrase derived from a hiccup note (modified "huit" usually of two syllables, sometimes three) and simple descending whistle frequently interjected. Repeated rasping whistles and hiccups in response to intruding conspecifics; "huit" note and descending whistles uttered occasionally while foraging, presumably as contact call.
Habitat. Tropical and subtropical thorny desert, xerophytic steppes and mesquite savannas; open thorn-woodland dominated by mesquite (*Prosopis*) and acacia (*Acacia*) where trees widely separated by sparse ground cover of grasses and herbs; often in agricultural areas, occasionally in isolated groves in otherwise desolate desert. To 500 m.
Food and Feeding. Apparently no data.
Breeding. Nest with eggs found in Dec and nestlings in May; N populations may breed later than S ones. Two nests described: one an open cup lined with fine coarse fur, fragments of tissue paper, newspaper, clear plastic and a few white feathers, 1 m above ground in darkened recess of large clump of *Acacia macracantha*, other was lined with similar materials but also snakeskin, 14 cm below entrance in tree cavity. Clutch up to 4 eggs; no information on incubation and fledging periods.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tumbesian Region EBA. Generally uncommon; fairly common in scattered *Acacia-Prosopis* woodlands near Rafán. Arid habitats within Tumbesian region adversely affected by cattle grazing and agriculture in valley bottoms, but overall remain within reasonable state. Despite having a relatively small range, this species is tolerant of converted habitat and is probably not at any risk; it is now rather local, however, because many trees are cut for firewood and are cleared for large-scale farming.
Bibliography. Bangs & Penard (1921), Cory & Hellmayr (1927), Cracraft (1985), Joseph *et al.* (2004), Koepcke (1970), Lanyon, W.E. (1975, 1978, 1985), Meyer de Schauensee (1982), Ridgely & Tudor (1994), Ridgway (1907), Stotz *et al.* (1996), Taczanowski (1884), Todd (1922), Zimmer (1938).

375. Yucatan Flycatcher

Myiarchus yucatanensis

French: Tyran du Yucatan **German**: Yucatanschopftyrann **Spanish**: Copetón Yucateco

Taxonomy. *Myiarchus yucatanensis* Lawrence, 1871, Mérida, Yucatán, Mexico.
Has in the past been suggested as being conspecific with *M. stolidus*, but differs significantly in morphological and vocal characters. Phylogenetic analysis of mitochondrial DNA placed it in a clade with *M. crinitus*, *M. cinerascens* and *M. tyrannulus*. Geographical variation, including populations on Cozumel I (*lanyoni*), seems ecophenotypic (correlated with rainfall and vegetation); nominate race and *navai* apparently intergrade in C Yucatán Peninsula; sampling needed in order to test validity of existing taxonomy. Three subspecies currently recognized.
Subspecies and Distribution.
M. y. yucatanensis Lawrence, 1871 - E Mexico, in extreme E Tabasco (near Balancán) and N & C Yucatán Peninsula.
M. y. lanyoni Parkes & A. R. Phillips, 1967 - Cozumel I, off NE Quintana Roo (Mexico).
M. y. navai Parkes, 1982 - S Quintana Roo (La Vega, Chetumal) and SE Campeche (Xpujil), in Mexico, and Guatemala (Tikal, in N Petén); probably also N Belize (Gallon Jug).
Descriptive notes. 17·5-19 cm; 19-23 g. Unusually rufescent-crowned *Myiarchus* (most populations) with sometimes distinct facial pattern. Nominate race has broad distinctively rufescent edges of dark brown-centred crown feathers (broadest on forecrown), creating streaked appearance; greyish lores and subocular ring; upperparts olive-green, tinged rufous on uppertail-coverts; wings brown, prominent rufous outer edges of primaries, pale greyish-white outer edges of secondaries and tertials, diffuse pale grey tips of greater and median wing-coverts (indistinct wingbars); tail brown, rufous on inner webs of rectrices (often only on innermost rectrices, often reduced or absent on outermost); throat and breast grey, abdomen and undertail-coverts yellow (not sharply demarcated from breast), tending to be washed with olive-green on upper flanks; tibial feathering olive-brown; underwing-coverts yellow; plumage colour recorded as changing rapidly after completion of prebasic moult, thus belly noticeably paler yellow (and mantle browner, tertial edges white, and dark brown of remiges and rectrices faded) in Nov than in Jan-Feb; iris, bill and legs dark, blackish. Distinguished from *M. tuberculifer* by greater amount of rufous in tail. Sexes similar. Juvenile presumably has rufous-tipped wing-coverts. Race *lanyoni* has entire upper surface darker with almost blackish cast, crown with little or no rufescent colour, abdomen paler yellow than nominate; *navai* is intermediate in dorsal coloration between previous and nominate, abdomen also paler yellow than nominate. Voice. Dawn song a fairly loud, clear, monotonously repeated "hoor-eep" or "hoow'eep", second part rising in frequency.



Habitat. Humid to semi-arid forest, scrubby woodland and edge; in deciduous forest found primarily in clearings or thinly wooded areas; in rainforest confined to light second growth and clearings. Sea-level to 250 m.
Food and Feeding. Little known. Hymenopterans recorded in one stomach.
Breeding. Three males with enlarged testes in second half Mar. No other information.
Movements. Presumably resident.
Status and Conservation. Not globally threatened. Fairly common to common. Occurs in Lamanai Archaeological Reserve and Río Bravo Conservation and Management Area, in Belize, and Laguna del Tigre National Park, in Guatemala. Population on Cozumel I (race *lanyoni*) has proven surprisingly difficult to locate at times, and concern over its conservation status seems warranted.
Bibliography. Anon. (1998a), Blake, E.R. (1953), Bond (1961b), Chapman (1896), Cory & Hellmayr (1927), Fitzpatrick (1980a), Howell & Webb (1995a), Joseph *et al.* (2004), Land (1970), Lanyon (1965), Lee Jones (2004), Nelson (1904), Parkes (1982), Parkes & Phillips (1967), Paynter (1955), Ridgway (1893, 1907), Smithe (1966), Storer (1961), Stotz *et al.* (1996).

376. Sad Flycatcher

Myiarchus barbirostris

French: Tyran triste **German**: Jamaikaschopftyrann **Spanish**: Copetón Jamaicano
Other common names: Jamaican Flycatcher

Taxonomy. *Tyrannula barbirostris* Swainson, 1827, "Mexico"; error = Jamaica.
Close relationship with *M. tuberculifer* (especially of race *platyrhynchus*) has long been acknowledged. In phylogenetic analysis of mitochondrial DNA, this species found to be most closely related to races *platyrhynchus*, *nigricapillus* and one Ecuadorean sample (identified as *atriceps*) of that species. Responds to playback of *M. tuberculifer* voice, but *platyrhynchus* does not respond to present species. This species should be included in the required taxonomic revision of *M. tuberculifer*. Monotypic.
Distribution. Jamaica.



Descriptive notes. 16·5 cm; 11·5-16·2 g. Relatively small *Myiarchus* with dark crown, broad bill, little or no rufous in tail. Has crown and auriculars smoky olive-brown, contrasting with more olive upperparts; uppertail-coverts olive-brown, tinged rufous; wings brown, little or no prominent clean rufous or cinnamon edging on primaries or secondaries, greyish tips of greater and median wing-coverts often tinged rufous (faint wingbars), tertials edged pale greyish; tail brown, rufous on outermost webs of some rectrices; throat and upper breast grey to pale whitish, abdomen and undertail-coverts lemon-yellow (yellow usually extending anteriorly onto upper breast); tibial feathering olive-brown; underwing-coverts yellow; Iris, bill and legs dark; mouth-lining bright orange. Differs from *M. tuberculifer* (of race *platyrhynchus*) in smaller size, darker crown, browner upperparts. Sexes similar. Juvenile is reported as having no yellow on breast. Voice. Single "huit" note identical to that of *M. tuberculifer*; whistle heard in dawn song not recorded during daylight hours; also emphatic "pip, pip, pip".
Habitat. Primarily lowland and montane evergreen forests and woodland, from sea-level to 2000 m; scarcer in semi-arid lowland areas and more open high-elevation forests, rarely in mangroves.
Food and Feeding. Small insects. Sallies from perches 3-9 m above ground to snatch prey from leaves; often returns to same perch.
Breeding. Few data. Season Apr-Jun. Nest constructed of vegetation, placed in cavity such as woodpecker (Picidae) hole, or under house eaves; recorded as inspecting holes in coconut palms. Clutch 3 or 4 eggs; no information on incubation and fledging periods.
Movements. Range contracts to middle elevations in non-breeding season.
Status and Conservation. Not globally threatened. Restricted-range species: present in Jamaica EBA. Common and widespread. Not known whether recent habitat change has constricted the species' range. In Jamaica, 75% of original forest cover already eliminated, and remaining forest largely second growth; undisturbed forest survives only on high mountain slopes, some of which are protected in the Blue Mountain and John Crow National Park, but hunting and habitat destruction continue because of lack of funds for protection and management. Resurgence in coffee cultivation since 1980s led to clearance of much second growth; other problems include hurricane damage, widespread pesticide use, timber removal, deliberate fires, and continuing conversion for small-scale farming and urbanization.
Bibliography. Anon. (1998a), Bond (1985), Cory & Hellmayr (1927), Faaborg (1985), Joseph *et al.* (2004), Lanyon (1967b), Levy (1996), Pregill *et al.* (1991), Raffaele *et al.* (1998, 2003), Ridgway (1907), Sclater (1871b), Stotz *et al.* (1996).

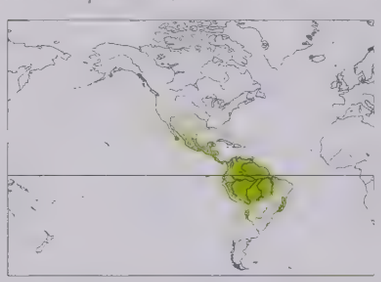
On following pages: 377. Dusky-capped Flycatcher (*Myiarchus tuberculifer*); 378. Swainson's Flycatcher (*Myiarchus swainsoni*); 379. Venezuelan Flycatcher (*Myiarchus venezuelensis*); 380. Panama Flycatcher (*Myiarchus panamensis*); 381. Short-crested Flycatcher (*Myiarchus ferox*); 382. Apical Flycatcher (*Myiarchus apicalis*); 383. Pale-edged Flycatcher (*Myiarchus cephalotes*); 384. Sooty-crowned Flycatcher (*Myiarchus phaeocephalus*).

377. Dusky-capped Flycatcher

Myiarchus tuberculifer

French: Tyran olivâtre **German**: Schwarzkappen-Schopftyrann **Spanish**: Copetón Capirotado
Other common names: Olivaceous Flycatcher

Taxonomy. *T[yrannus] tuberculifer* d'Orbigny and Lafresnaye, 1837, Guarayos, Santa Cruz, Bolivia.
Taxonomy highly complex; almost certainly more than one species involved. Phylogenetic analysis of mitochondrial DNA indicates that those Mexican and Panamanian populations examined are more closely related to *M. barbirostris* of Caribbean than to most South American populations of present species; populations of nominate race from Argentina, lowland Ecuador and Guyana formed a well-supported clade. Taxonomic status of *atriceps* particularly doubtful: birds from N extremity of range (Ecuador) found to be closely related to Mexican and Panamanian populations of *platyrhynchus* (*sensu lato*) and *nigricapillus*, whereas those from S extremity (Argentina) were closer to nominate (these findings may be due to introgression, hybridization, faulty taxonomy, or a combination of these factors); further, minor but constant morphological differences in plumage and size exist between N (Ecuador, Peru, N Bolivia) and S populations; molecular diversity in C part of its range in Bolivia should be studied in order to understand patterns of diversity, and to assess the merit of raising *atriceps* to species rank. In addition, races intergrade widely throughout most of species' range, and differences among many of them are at present described in unconvincing and unsatisfactory terms of degrees of shading on dorsal surface. Long-overdue revision needed, with attention paid especially to whether phenotypic variation is clinal and where major disjunctions (if any) occur, the nature of any phylogenetic relationships among races, and the nature of morphological and molecular variation in zones of contact and parapatry; moreover, thorough reassessment of variation in Middle and North American populations required. Thirteen subspecies tentatively recognized.
Subspecies and Distribution.
M. t. olivascens Ridgway, 1884 - breeds SW USA (C & SE Arizona, SW New Mexico) and NW Mexico (NW Chihuahua S in mountains to E Sinaloa, W Durango and N Nayarit); winters W & S Mexico (S Sonora S to Santa Efigenia, in Oaxaca).
M. t. querulus Nelson, 1904 - SW Mexico from S Sinaloa S, including Tres Marías Is, to Oaxaca.
M. t. lawrenceii (Giraud, 1841) - E Mexico (Nuevo Léon S to Tabasco and Chiapas) S to highlands of Guatemala and El Salvador.
M. t. manens Parkes, 1982 - E Mexico (E Tabasco E to Yucatán and Quintana Roo) and N Belize.
M. t. platyrhynchus Ridgway, 1885 - Cozumel I, off NE Yucatán Peninsula.
M. t. connectens W. deW. Miller & Griscom, 1925 - W Belize and Guatemala S to N & C Nicaragua.
M. t. littoralis J. T. Zimmer, 1953 - Pacific coast of Nicaragua and NW Costa Rica.
M. t. nigricapillus Cabanis, 1861 - extreme SE Nicaragua, Costa Rica (except extreme NW) and W Panama.
M. t. brunneiceps Lawrence, 1861 - E Panama (E from Canal Zone) and W Colombia (S through Cauca and Magdalena Valleys to Valle and Huila).
M. t. pallidus J. T. Zimmer & Phelps, Sr, 1946 - NE Colombia and N & W Venezuela.
M. t. tuberculifer (d'Orbigny & Lafresnaye, 1837) - lowland Amazonia (except much of SE), also Trinidad, and SE Brazil.
M. t. nigriceps P. L. Sclater, 1860 - SW Colombia (upper Cauca Valley) S to W Ecuador (S to Guayas and Chimborazo).
M. t. atriceps Cabanis, 1883 - S Ecuador S in Andes to Argentina (S to Tucumán).



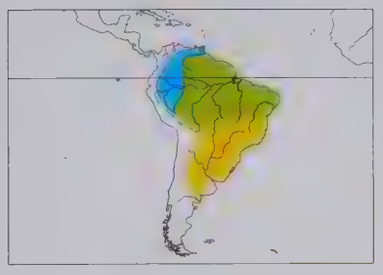
Descriptive notes. 15-17 cm; male 16·4-25 g, 18·0-27 g (*atriceps*), male 18-24 g and female 14·2-23 g (combined samples of nominate, *pallidus*, *brunneiceps* and *nigriceps*). Generally smallish *Myiarchus* with dark crown, richly yellow belly. Nominate race has very dark slate-grey to olive-grey crown, variably darker centres of feathers (creating streaked effect on some); face, lores and auriculars not noticeably contrasting with crown; upperparts olive-green, darker olive (approaching colour of crown) on uppertail-coverts; wings brown, little or no pale outer edging on primaries, outer edges of secondaries and tertials respectively pale rufous and greyish-white, greater and median wing-coverts diffusely tipped with greyish cream (indistinct wingbars); tail dull brown, some rufous edging in fresh plumage; throat and breast grey, tending paler on throat, sometimes olive wash on side of upper breast; abdomen and undertail-coverts yellow, tibial feathering olive-brown; underwing-coverts yellow; iris, bill and legs black; inside of mouth orange. Sexes similar. Juvenile has rufous-tipped wing-coverts, rufous outer edges of primaries, rufous edges and tips of rectrices. Races differ mainly in plumage coloration and tone: *pallidus* is paler above, especially on crown, which is a smoky olive; *brunneiceps* resembles nominate, but has greener back; *nigriceps* has noticeably blacker crown, rich yellow belly, sometimes greyish hindcollar; *atriceps* is larger than nominate and with noticeably black pileum, sometimes greyish hindcollar, like previous but larger, belly often paler yellow; *nigricapillus* has back greener, crown less black, rectrices, remiges and wing-coverts fringed, edged or tipped rufous; *connectens* is questionably distinct from previous, but perhaps slightly darker on crown, more strongly washed olive on breast side; *littoralis* has paler crown and upperparts than last two, throat whitish; *lawrenceii* is large, olive-grey above, crown only slightly darker than back, extensive rufous tips and fringes on remiges, rectrices (outer webs) and wing-coverts; *querulus* is questionably distinct from previous, possibly with more rufescent edges of crown feathers, possibly more evident hindcollar (dorsal extension of grey from breast); *manens* is smaller than last, with broader bill, no rufous fringes on rectrices; *platyrhynchus* differs from previous in reportedly whiter (less yellow) underwing-coverts; *olivascens* is smallest race, has entire dorsal surface decidedly greyer and less olive than all others, often a light grey hindcollar (continuation of grey from breast), little or no rufous or cinnamon in wings and tail. Voice. All races emit a distinctive plaintive whistle, "wheeeeu", fading at end. Male gives territorial dawn song, a varied repetition of short, often plaintive phrases, e.g. "wheeu reehr-peu". Also a rising and falling buzzy trill; a sharpish "ki-dee ew" repeated 2-3 times; a gravelly chatter, during interactions; a thin "pheeee" or "seeeee"; and others. Some geographical variation reported in frequency and song pattern; further study required in order to establish possible taxonomic implications.
Habitat. Usually in dry, moist or humid forest (tropical lowland forest, montane evergreen forest), forest borders, canopy at clearings and openings in tall forest, coffee plantations, *várzea*, *igapó*, riparian woodland. In Amazonia, in *várzea* and regrowth forest but not in *terra firme* primary rainforest; in Peru, absent from earliest successional vegetation dominated by *Tessaria* and *Gynerium* along white-water rivers, but at low density in all later stages up to mature forest; also, humid cloudforest and mossy elfin forest 3400 m (*atriceps*). Oak (*Quercus*) and pine (*Pinus*) woodland in USA, and tropical semi-deciduous humid oak-pine cloudforest and dry pine-oak forest in Mexico. From sea-level to above 3000 m; in USA (Huachuca Mts, in Arizona) most abundant below 1800 m but breeds to 2500 m; in Venezuela, to 2000 m N of R Orinoco and to 1300 m S of it; in Andes, to 2400 m (*nigriceps*) and locally as high as 3400 m (*atriceps*).
Food and Feeding. Arthropods, including grasshoppers (Orthoptera), termites (Isoptera), flies (Diptera), damselflies (Zygoptera), mayflies (Ephemeroptera), butterflies and moths (Lepidoptera), beetles (Coleoptera), miscellaneous bugs (e.g. cicadids, membracids), bees and wasps (Hymenoptera), and spiders (Araneae); also berries, and seeds of *Casdaria sylvestris* (in Central America). Forages singly or in pairs; recorded at army-ant swarms. Regularly joins mixed-species flocks throughout range. Forages in dense shrubs and mid-canopy of forest, perching vertically or horizontally and peering about with bowed head, sallying outward or downward to glean insects, often by hover-gleaning.
Breeding. Season mid-May to late Jul in USA; laying mid-Apr to mid-Jun in Mexico, Central America and Trinidad; in South America, breeds Mar-Jun in W & N (*pallidus*, *brunneiceps*, *nigriceps*). Aug-Oct in Amazonia but recorded Apr-May in SE Venezuela (nominate), probably Mar-Jun in W Ecuador; gonads enlarged, eggs in oviduct Sept-Dec in SE Peru and N Bolivia, and recorded mid-Nov to Dec in Andes of Argentina and S Bolivia (*atriceps*). Nest in cavity, material and lining dried weed stems and moss, fine plant fibres, hair, fur, snakeskin, once recorded as taking pieces of eggshell and silver paper almost from feet of campers (presumably for use as nest material); cavities used include those in trees (up to 12 m above ground), deserted woodpecker (Picidae) holes (5 m up), in darkened recesses of dead palm fronds (10 m up), also holes in fence posts, hollow bamboo stems, and in broken top of leaning tree trunk, lowest recorded nest height 25 cm; reported as using cavity in two consecutive years (Central America, Trinidad); one report of possible renesting after loss of first clutch (Arizona). Clutch 3-4 eggs; both parents attend nest; fledging period at least 13 days; no other information.
Movements. Mainly resident. Some local (perhaps primarily altitudinal) movements in N (race *olivascens*); spring migrants found at 1200 m in Arizona (USA), and recorded in pine-oak woodland to 2100 m and riparian woodland down to 1000 m in N Sonora (Mexico). Cozumel I population (*platyrhynchus*) absent in winter; winter range unknown but a migrant found near coast of E Honduras. Evidence of movements, possibly altitudinal, or mid-distance migration, in Bolivia: *atriceps* reportedly only a breeding visitor in S Bolivian Andes, present throughout year to N.
Status and Conservation. Not globally threatened. Uncommon to abundant. In many regions the most common and widespread *Myiarchus* flycatcher. Estimated global population 20,000,000 individuals. Apparently slight recent extension of range N in USA, but survey data showed no constant trend. Given its tolerance of somewhat disturbed habitats, its general abundance and its very large range, this species is unlikely to become threatened. Occurs in numerous national parks and other protected areas throughout its distributional area.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bent (1942), Binford (1989), Borges *et al.* (2001), Canevari *et al.* (1991), Chesser (1997), Cohn-Haft *et al.* (1997), Contreras (1997), Cory & Hellmayr (1927), Davies *et al.* (1994), Davis (1961), DeGraaf & Rappole (1995), Di Giacomo & López (2000), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), ffrench (1991), Fitzpatrick (1980a, 1980c, 1985a), Gillespie & Walter (2001), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995a), Joseph & Wilke (2004), Joseph, Wilke & Alpers (2003), Joseph, Wilke, Bermingham *et al.* (2004), Kaufman (1996), Komar (2002), Lanyon (1978), Miller (1963), Monroe (1968), Narosky & Salvador (1998), Nelson (1904), Oren & Parker (1997), Parker *et al.* (1985), Parkes (1982), de la Peña (1988), Perry *et al.* (1997), Price *et al.* (1995), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Robinson & Terborgh (1997), Rowley (1984), Salaman (1994), Scott & Patton (1989), Sick (1993, 1997), da Silva (1996b), Skutch (1960, 1981), Slud (1964), Staicer *et al.* (1996), Stiles & Skutch (1989), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Terborgh, Fitzpatrick & Emmons (1984), Terborgh, Robinson *et al.* (1990), Tostain *et al.* (1992), Tweit & Tweit (2002), Udvardy (1963), Vega-Rivera *et al.* (2003), Wetmore (1972), Wiedenfeld *et al.* (1985), Williams & Tobias (1994), Willis (1980), Zimmer, J.T. (1930, 1938), Zimmer, K.J. & Hilty (1997), Zimmer, K.J. *et al.* (1997).

378. Swainson's Flycatcher

Myiarchus swainsoni

French: Tyran de Swainson **German**: Swainsonschopftyrann **Spanish**: Copetón de Swainson
Other common names: Pelzeln's Flycatcher (*pelzelni*); Whiteley's Flycatcher (*phaeonotus*)

Taxonomy. *M[yiarchus] Swainsoni* Cabanis and Heine, 1859, Rio de Janeiro, Brazil.
A taxonomically difficult complex; in need of revision that carefully integrates molecular and morphological data. Nominate race is larger and/or darker than most others, also differs vocally, and phylogenetic analysis of mitochondrial DNA indicates that it is not closely related to other races; almost certainly represents a separate species. From mtDNA studies, other races appear extraordinarily closely related to each other (although *phaeonotus* not included in samples), and also closer to *M. tuberculifer* and *M. barbirostris* than to all other taxa in genus (as mirrored in voice-playback experiments). Hypothesis that variation between races *pelzelni* and *ferocior* (possibly including *phaeonotus*) is clinal, with increase in size and increasingly paler upperparts from N to S, needs to be tested. Phenotypic intergradation occurs between nominate and *ferocior*, but at mtDNA level this is unidirectional, and hitherto only mtDNA from latter taxon recorded in zone of morphological intergradation. Field and laboratory studies needed. Birds from N sandy savanna of Surinam described as a further race, *albimarginatus*, but characters appear attributable to fresh-plumaged intergrades between *phaeonotus* and *pelzelni*. Notably, two such intergrade specimens from nearby Guyanan savannas have highly divergent mtDNA; further study required. Four subspecies currently recognized.
Subspecies and Distribution.
M. s. phaeonotus Salvin & Godman, 1883 - tropical and subtropical zones of SE Venezuela, W Guyana and adjacent N Brazil (upper R Negro and R Branco).
M. s. pelzelni Berlepsch, 1883 - S & E perimeter of Amazon Basin S to SE Peru, N Bolivia and SC Brazil (S to Mato Grosso, S Goiás and Minas Gerais).
M. s. swainsoni Cabanis & Heine, 1859 - breeds SE Paraguay and SE Brazil (São Paulo, Rio de Janeiro) S to extreme NE Argentina (Misiones) and Uruguay; migrates to N South America, from E Colombia, W Venezuela and Trinidad E to NE Brazil (Paraíba).
M. s. ferocior Cabanis, 1883 - breeds SE Bolivia, W Paraguay and Argentina (S to La Pampa and Buenos Aires); migrates to Amazon Basin as far N as S Colombia.
Descriptive notes. 19·5-21 cm; male 21·5-28·5 g, female 21·3-28·9 g (*swainsoni*), male 34·6-37·6 g (*ferocior*), both sexes 19·8-26 g (Surinam), means for both sexes 21-25·38 g (various races). Larger, dark-tailed *Myiarchus*. Nominate race has crown and upperparts a nondescript dull olive grey-green with no marked contrast, except tending to slightly browner colour on uppertail-coverts; lores and face usually not noticeably lighter than crown; wings brown, primaries with rufous outer edges and secondaries and tertials with pale whitish-yellow outermost webs (in fresh plumage), innermost webs of tertials dirty whitish to rufous, contrasting with brown of rest of feathers;



greater and median wing-coverts broadly tipped fuscous grey or, only occasionally, clear white (two indistinct wingbars); tail plain brown, outermost webs of outermost rectrices sometimes slightly paler, in fresh plumage often some rectrices with rufous fringe; throat and breast grey, usually tending to be paler on throat, abdomen and undertail-coverts yellow with somewhat grey tinge, upper flanks often with distinctly green wash, tibial feathering olive-brown; underwing-coverts yellow; iris dark; upper mandible brown, lower mandible pale rufous-brown to pinkish; legs blackish. Sexes similar. Juvenile has rufous tips of wing-coverts and fringes on tail (although specimens with fully ossified skull can have rufous wing-covert tips). Race *phaeonotus* is dark smoky grey, almost blackish, above, bill all black; *pelzelni* has no dark suffusion in olive-green upperparts, slightly paler throat and underparts than nominate; *ferocior* is palest, dorsal colour plain but light olive-green, brownish-olive auriculars darker than rest of head, yellower (less grey) below. Voice. Mournful whistle commonly heard; dawn song comprises alternated mournful whistles, "huit" notes and more complex phrases; repeated rolls and rasps in response to intruding conspecifics.

Habitat. Variety of habitats, but primarily clearings, wooded areas (especially *cerrado*, savannas), light scrub, riparian vegetation. Wooded slopes of tepuis and clearings in tropical forest, to 1800 m (*phaeonotus*); canopy of subtropical hill forest, also to 1200 m in more lightly wooded drier valleys (*pelzelni*). Nominate race recorded in 60-ha fragment of vegetation (isolated by 2 km from any other large forest area), with *Aspidosperma polyneuron*, *Euterpe edulis*, *Galesia inetgrifolia* and *Ficus glabra* as dominant trees; also in fragments (7·6-47·3 ha) in an urban environment. In non-breeding season, race *ferocior* recorded in Chaco and rainforest, in Peru not in earliest successional vegetation dominated by *Tessaria* and *Gynerium* along white-water river but present in later stages up to mature forest; to 2600 m in Colombia (near Bogotá). Nominate race also found in mangroves on non-breeding grounds in Venezuela and Surinam.

Food and Feeding. Insects, also fruits; insects and seeds of berries in stomach contents (nominate race). Reported as "quite frugivorous" in non-breeding areas. Nestlings fed with insects, e.g. dragonfly (Odonata), and berries. Recorded as feeding on insects 30 cm above ground in bushes; nominate race has been observed in all strata of "scrub" in varying stages of succession, but most often in mid-strata. Of 61 observations of non-breeding *ferocior* in Peru, most were of birds using outward hover-gleaning to capture prey, with minor proportions of aerial hawking and striking, and some observations of frugivory.

Breeding. Feb-May in N (*phaeonotus*), Sept-Dec in Amazon Basin (*pelzelni*) and Nov to early Jan in S (nominate and *ferocior*). Nest materials dried stems and moss, fine plant fibres, similar to those used by congeners; nest usually in tree cavity, sometimes under house roof, also in nestbox; nests in boxes used by nominate race had much plant material (principally "paina") and some pieces of snakeskin and feathers in upper layers, but animal material generally not common in upper layer; in Argentina, one nest with external diameter 8 cm, internal diameter 6 cm and depth 4 cm, placed 4 m above ground in old nest of Rufous Hornero (*Furnarius rufus*), another had external diameter 10 cm, height 5 cm, internal diameter 5 cm, depth 3 cm, located 4·2 m up in hollow of decayed branch of *Prosopis*; nestboxes used twice consecutively in Brazil (São Paulo). Clutch 3 or 4 eggs (*M. s. swainsoni*); no information on incubation and fledging periods.

Movements. S populations of nominate and *ferocior* migratory, moving to, respectively, N South America (E Colombia E to E Brazil) and Amazon Basin (N to S Colombia); migratory status of more N breeding populations of these races, however, unclear. Nominate tracks relatively constant temperature range throughout year during course of annual migration. Migratory status of *pelzelni*, and that of intergrading races, warrants further study.

Status and Conservation. Not globally threatened. Fairly common to common. Occurs in at least twelve national parks and many other protected areas throughout its very large range. Able to live a reasonably wide range of wooded habitats, and thought unlikely to be at any risk in the near future.

Bibliography. Alves & Cavalcanti (1996), dos Anjos (2001), dos Anjos *et al.* (1997), Babarskas *et al.* (2003), Belton (1985), Borges *et al.* (2001), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Cory & Hellmayr (1927), Di Giacomo (2004), Dubs (1992), ffrench (1991), Fitzpatrick (1980c), Fjeldså & Maijer (1996), Friedmann (1948), Hartert & Venturi (1909), Haverschmidt (1968, 1972), Haverschmidt & Mees (1994), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Joseph (1996), Joseph & Stockwell (2000), Joseph, Wilke & Alpers (2003), Joseph, Wilke, Bermingham *et al.* (2004), Krügel & dos Anjos (2000), Lanyon (1978, 1982a), Leo *et al.* (2002), Lowen *et al.* (1996), Machado & Rodrigues (2000), Mees (1968, 1985), Módena *et al.* (2000), Narosky & Salvador (1998), Navas & Bó (2001), Pearson (1980), de la Peña (1988), Peris (1990), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Robinson *et al.* (1988), Rodrigues & Santos (2000), do Rosário (1996), Short (1975), Sick (1993, 1997), da Silva *et al.* (1997), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Terborgh, Fitzpatrick & Emmons (1984), Terborgh, Robinson *et al.* (1990), Tostain *et al.* (1992), Tubelis (1998), Tubelis & Cavalcanti (2001), Wetmore (1926), Zimmer (1938).

379. Venezuelan Flycatcher

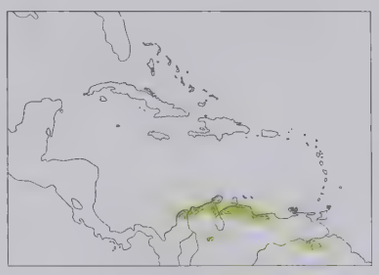
Myiarchus venezuelensis

French: Tyran du Venezuela **German**: Venezuelaschopftyrann **Spanish**: Copetón Venezolano
Other common names: Fierce Flycatcher

Taxonomy. *Myiarchus venezuelensis* Lawrence, 1865, Lago de Valencia, Carabobo, Venezuela.

Formerly treated as a race of *M. ferox*. Analyses of morphological characters and mitochondrial DNA indicate close affinities with that species and also with *M. phaeocephalus* and *M. panamensis*, but precise relationships within that group unclear. In study of phylogeny of genus, mtDNA of a single individual of present species examined was nested within *M. ferox*, suggesting past hybridization between the two, or incomplete sorting of mtDNA in this group of species, or misidentification (as no voucher was available). Careful ecological and genetic study of these species in zones of parapatry and sympatry should be rewarding. Tobago birds appear darker dorsally, but difference slight and constancy of this character untested; subspecific separation as *insulicola* unwarranted at present. Monotypic.

Distribution. Apparently three, possibly four, disjunct populations. Caribbean lowlands of Colombia (N Sucre E to Guajira), and E of Andes in Norte de Santander (Cucutá); NW & N Venezuela (Zulia; and far E Falcón and E Yaracuy E through lowland Carabobo and Aragua to Distrito Federal, E to Puerto La Cruz); and recorded also NE & E Venezuela (Margarita I; NE Bolívar) and Tobago. Records from Zulia (Cerro Alto del Cedro, La Esperanza) may be referable to Colombian population (to W) or to Venezuelan ones (to E), or may represent a separate population.



Descriptive notes. 19 cm; male 27-32 g, female 27-33 g, unsexed 26-28 g. Generally unremarkable *Myiarchus* with combination of reasonably apparent whitish streaking on grey breast and very pallid yellow belly. Plumage is dark olive-green above, centres of crown feathers darker and creating both streaked effect and a contrast with upperparts; sometimes crown and back darker and contrasting slightly with greyer mantle and uppertail-coverts (Tobago); primaries often edged strongly with rufous, outer webs of tertials pale whitish-yellow, two well-marked wingbars (in fresh plumage); tail brown, outer webs of outer pair of rectrices noticeably paler than inner ones, outer webs of other rectrices conspicuously fringed with brown or cinnamon-yellow, normally no rufous (likely only in fresh plumage); throat and breast grey, whitish feather centres on especially throat and upper middle breast creating distinctive streaked appearance; belly and undertail-coverts washed-out pallid yellow; tibial feathering olive-brown; iris, bill and legs dark. Differs from similar *M. panamensis* in being paler below, usually more rufous in primaries; from lighter-backed forms of *M. ferox* in streaked breast and very pallid yellow belly. Sexes similar. Juvenile presumably has rufous-tipped wing-coverts and more pronounced rufous on tail. Voice. Repeated hiccups, rasps, rasp-whistles and "wheer-r-r" notes in response to intrusion by conspecifics ("wheer-r-r" similar to that of *M. tuberculifer*, the only other species for which this vocalization recorded). Plaintive whistles during foraging. Dawn song comprises identical whistles but in series with 4, 8 or 10 seconds between each. Vocal repertoire differs from that of *M. ferox* and *M. panamensis*, has no rolls or "huit" notes.

Habitat. Clearings and borders of dry and moist forest and deciduous (in understorey) and semi-deciduous woodland; drier scrubby pasture with scattered trees and brushy borders. Recorded in cocoa plantations in Venezuela (Aragua). Found in clearings in higher forested areas, but not in coastal lowlands, on Tobago. To 600 m.

Food and Feeding. Insects and small fruits. Forages in middle storey of trees or tall shrubs, perching vertically or horizontally and peering about with bowed head, sallying outward or downward to glean insects, often by hover-gleaning.

Breeding. Season late Mar to early Jun; males with testes unenlarged in Jan, enlarged in May; females with brood patches and eggs in oviduct in May; also, laying reported in Oct. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Generally considered uncommon to fairly common, but is often overlooked. Occurs in Henri Pittier National Park, in Venezuela. Poorly known species.

Bibliography. Carriker (1954), Chapman (1917c), Cory & Hellmayr (1927), ffrench (1991), ffrench & Kenefick (2003), Haffer (1975), Haffer & Borrero (1965), Hilty (2003), Hilty & Brown (1986), Joseph *et al.* (2004), Lanyon (1978), Ridgely & Tudor (1994), Ridgway (1907), Sharpe *et al.* (2001), Snow (1985a), Stotz *et al.* (1996), Verea & Solórzano (1998, 2001), Verea *et al.* (2000), Visbal *et al.* (1996), Wetmore (1939).

380. Panama Flycatcher

Myiarchus panamensis

French: Tyran du Panama **German**: Panamaschopftyrann **Spanish**: Copetón Panameño

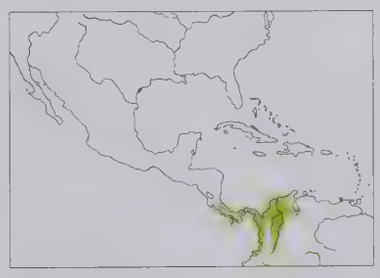
Taxonomy. *Myiarchus panamensis* Lawrence, 1860, Atlantic slope of Canal Zone on Panama Railroad, Isthmus of Panama.

Formerly treated as a race of *M. ferox*, but the two differ in vocalizations and do not respond to playback of voice of each other; similarly, species-level separation from *M. venezuelensis* argued on basis of sympatry in extreme NW Venezuela (near Cerro Alto del Cedro) and in N Colombia (Cansoma, in Bolívar). Analyses of morphological characters and mitochondrial DNA indicate close affinities with those two species and also with *M. phaeocephalus*, but precise relationships within that group unclear. Careful ecological and genetic study in zones of parapatry and sympatry would be rewarding. Re-examination of geographical distributions of these taxa and their ecology and taxonomy, especially S & E of L Maracaibo (W Venezuela), is warranted. Two subspecies recognized.

Subspecies and Distribution.

M. p. actiosus Ridgway, 1906 - Pacific coast of Costa Rica (Gulf of Nicoya S to point N of Osa Peninsula).

M. p. panamensis Lawrence, 1860 - extreme SW Costa Rica (Rincón de Osa, Puerto Jiménez), Panama (Caribbean slope in W Bocas del Toro and from N Coclé E to San Blas, lowlands and foothills on Pacific coast, also Pearl Is, Coiba I, Taboga I and other smaller islands), N & W Colombia (E to Guajira Peninsula, S to Tumaco, in SW Nariño, lower Cauca Valley and upper Magdalena Valley at least to Neiva and Villavieja) and Maracaibo region of NW Venezuela.



Descriptive notes. 19 cm; 28·1-38·5 g. Relatively plain olive-backed *Myiarchus* with no rufous in tail, faint wingbars. Nominate race is greyish-olive above, centres of crown feathers darker and creating both streaked effect and a contrast with upperparts; wings as back, outer webs of tertials pale whitish-yellow; tail brown, outer pair of rectrices usually with outer vanes barely paler than inner ones, normally no rufous (likely only in fresh plumage); throat and breast grey, breast and undertail-coverts yellow, tending to be brighter in centre of abdomen, upper flanks often with greenish wash, tibial feathering olive-brown; iris, bill and legs dark, lower mandible sometimes slightly paler basally (upper Magdalena Valley, in Colombia); inside of mouth orange. Distinguished from similar *M. venezuelensis* by darker and unstreaked throat, less rufous in primaries, brighter and more lemon-yellow belly; from extremely similar *M. ferox* by generally lighter dorsal surface, but often indistinguishable on basis of plumage alone. Sexes similar. Juvenile has wing-coverts and tail feathers edged rufous. Race *actiosus* has greyer upperparts and paler abdomen than nominate. Voice. Repeated hiccups (normally disyllabic), rasping whistles and rolls in response to intruding conspecifics; long series of rasping whistle notes followed by one or more roll notes that descend in frequency; occasional "huit" note given. Dawn song comprises isolated, short, slowly modulated whistles given every 2-3 seconds (identical with

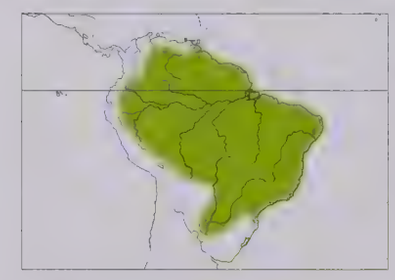
less frequently emitted notes given by foraging birds at other times of day). Differences in calls from those of *M. ferox* exceed usual degree of difference between *Myiarchus* species.
Habitat. Tropical deciduous forest, gallery forest, secondary forest, mangrove forest and arid lowland scrub; open woodland, also other semi-open habitats (borders of fields, pastures with scattered brush). Mangroves especially W of Andes; race *actiosus* confined to mangroves. Sea-level to 1400 m.
Food and Feeding. Insects and fruit; grass "berries" in edge habitat. Hawks flying insects from open perches; sallies to snatch prey from vegetation. Runs along ground or mangrove roots in manner of a thrush (*Turdus*), sallying up at flying or resting insects.
Breeding. Breeds late Mar to early Jun; possibly later, May-July, in upper Magdalena Valley (Colombia), as suggested by pre-breeding moult being completed late Apr and juveniles found as late as mid-Oct. Nest in cavity, lined with bulky mass of rootlets, vines, leaf fragments, plant down, animal hair and snakeskin, usually 4-12 m above ground in tree, occasionally under an eave; also recorded as using nestboxes, upper end of metal pipe (diameter 10 cm) set at an angle in ground, and crevice 3 m above ground in low cliff flanking road. Clutch 2-3 eggs; no information on incubation and fledging periods.
Movements. Presumably sedentary; possibly minor altitudinal movement in Colombia.
Status and Conservation. Not globally threatened. Uncommon to fairly common; uncommon in E Panama (Darién). Occurs in Carara Biological Reserve and Tarcol Lodge, in Costa Rica, and Tambito Nature Reserve, in Colombia.
Bibliography. Anon. (1998a), Burton (1973), Chapman (1917c), Cory & Hellmayr (1927), Haffer (1975), Haffer & Borrero (1965), Hellmayr & Seilern (1915), Hilty (2003), Hilty & Brown (1986), Joseph *et al.* (2004), Lanyon (1978), Nelson (1904), Olson (1997), Ralph & Chaplin (1973), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Wetmore (1946, 1952, 1957, 1972), Wright *et al.* (1985).

381. Short-crested Flycatcher

Myiarchus ferox

French: Tyran féroce **German**: Kurzschopftyrann **Spanish**: Copetón Feroz

Taxonomy. [*Muscicapa*] *ferox* J. F. Gmelin, 1789, Cayenne.
Formerly included *M. venezuelensis* and *M. panamensis* as races. Analyses of morphological characters and mitochondrial DNA indicate close affinities with those species and also with *M. phaeocephalus*, but precise relationships within that group unclear. In study of phylogeny of genus, mtDNA of single individual of *M. venezuelensis* examined was nested within present species, suggesting past hybridization between the two, or incomplete sorting of mtDNA in this group of species, or misidentification of that single sample (as no voucher was available). Careful ecological and genetic study of these species in zones of parapatry and sympatry should be rewarding. Geographical variation in present species complex and incompletely understood. Plumage differentiation among the three races is slight, and vast zones of intergradation are currently recognized. Populations in hybrid zone between nominate and *brunnescens* were thought by some earlier authors to be migrant *australis*, but this is refuted by their having different breeding and moult schedules (many intermediate birds, however, distinguishable from *australis* only through these differences in timing). Molecular phylogeographical analysis of 14 samples from this intergradation zone and from the core Amazonian range of nominate revealed no phylogeographical structure; notably, samples from these two regions and from a third, C Guyana (Iwokrama), each fell in a different clade; given that no samples from core ranges of either *brunnescens* or *australis* were included, however, these results may reflect mtDNA of nominate race only. Further study needed in order to clarify phylogeography and evolutionary history of this species. Three subspecies currently recognized.
Subspecies and Distribution.
M. f. brunnescens J. T. Zimmer & Phelps, Sr, 1946 - core range a narrow belt of *llanos* in SW Venezuela (Táchira and Portuguesa E to NW Bolívar) and extreme NE Colombia.
M. f. ferox (J. F. Gmelin, 1789) - Amazon Basin (from E slopes of Andes in S Colombia, Ecuador, Peru and N Bolivia) E to E & S Venezuela, the Guianas and Brazil.
M. f. australis Hellmayr, 1927 - lowlands from SE Bolivia, C Brazil (through S Mato Grosso, S Goiás, S Minas Gerais) and S through drainages of R Paraguay, R Paraná and R Uruguay to Argentina (S to S Corrientes) and extreme SW Rio Grande do Sul (Brazil); possibly also N & W Uruguay.



Descriptive notes. 18 cm; male 21-33 g, female 23·5-34 g. A generally larger, dark-tailed, slightly crested *Myiarchus*, noticeably sooty-grey to darkish olive-green above. Nominate race is typically smoky brown above, little or no contrast between crown and upperparts; wings relatively plain dark brown, greater and median wing-coverts broadly tipped with paler fuscous-brown (tending paler on medians), outermost webs of tertials whitish-yellow to greyish (probably proportional to amount of wear); rectrices dark smoky brown, fringed with rufous only in fresh plumage; throat and breast grey (tending lighter on upper throat), grey extending onto lores and face, the latter darker grey than lores; abdomen and undertail-coverts yellow, tibial feathering olive-brown, underwing-coverts yellow; iris, bill and legs dark. Sexes similar. Juvenile has rufous tips on wing-coverts, rufous edges on innermost and outermost webs of tertials and outermost webs of rectrices. Races vary mainly in plumage tone, but complicated by extensive intergradation: *brunnescens* is lighter brown above than nominate, has more rufous fringing on rectrices (fresh plumage), upper flanks washed with olive-green; *australis* similar to previous, with crissum less brown. Voice. Short, slowly vibrato-modulated whistles given infrequently during foraging; vocal response to intruding conspecifics comprises rasping whistles, hiccups, and sometimes strident rattles; a rattle call given in response to playback, unique in genus. Dawn song comprises isolated whistles with vibrato modulation, identical to sounds made while foraging during day.
Habitat. Clearings in forested areas, woodland borders, *cerrado*, *várzea*, *igapó*, riparian woodland and agricultural areas. In primary successional gradient associated with a white-water river in Peru, inhabited monocultures of the woody composite *Tessaria* and also *Tessaria* invaded by the cane *Gynerium sagittatum*. Tropical zone mostly below 500 m but up to 1000 m; record at 1375 m in Peru (Cuzco), possibly a response to forest clearance.
Food and Feeding. Insects and fruits; recorded food items in Surinam beetles (Coleoptera), hemipterans, including heteropteran stink or assassin bugs (Reduviidae), and *Capsicum* berries. Analysis of 38 prey items taken from stomachs in SE Peru gave: Hymenoptera (ants 21%, bees and wasps 16%); Hemiptera (Pentatomidae 24%, other 6%); Homoptera (cicadas 13%, planthoppers 3%); Diptera (11%); Orthoptera (3%); and Coleoptera (3%). Forages singly or in pairs, scanning from perches in middle and lower levels; average perch height recorded as 4·7 m in forest edge and 2·1 m in savanna. In Amazonian savanna, forages mostly by upward-striking in vegetation; along Peruvian river-edges, forages with upward strikes and outward hover-gleans 1-4 m above ground within and at edges of shrubby growth.
Breeding. Nominate race and *australis* breed mainly Jul-Dec; nests with eggs in Surinam populations currently ascribed to nominate found Oct-Dec (one exceptional report of eggs in mid-Apr), nine specimens of nominate from N Brazil (Amapá, Belém) in Jul and Sept-Nov have enlarged gonads, three Dec birds from Guyana have gonads enlarged (one female, one male) or, possibly, regressing (one female); *brunnescens* and populations currently considered intermediate between it and nominate (all or most of which are N of equator) breed Mar-May, thus when S populations of nominate and *australis* are in fresh plumage or completing annual moult. Nest typical of genus, in tree cavity and lined with feathers, fur and shed skin of snakes and lizards, lining also recorded as including plant material ("paina") from two species of Asclepiadaceae, grasses, palm fruits and various unidentified leaves and roots; layers of lining suggest that nests reused; recorded nests in natural sites have been low, one (in Surinam) was in a low *Curatella americana*, others (in Mato Grosso, in Brazil) were 1 m and 1·3 m above ground in angled tree trunk over water. Clutch 2 eggs (Surinam) or 3 eggs (Mato Grosso, Brazil); no information on incubation and fledging periods. Nests probably parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Sedentary.
Status and Conservation. Not globally threatened. Fairly common to common. Estimated population density in primary successional habitat in Peru 56·5 birds/100 ha (both in monocultures of *Tessaria* and in *Tessaria* invaded by *Gynerium sagittatum*). Thrives in secondary and more open habitats; possibly increasing and expanding range as a result of deforestation. Occurs in many national parks and other protected areas throughout its large range.
Bibliography. Begazo (1995), Bokerman (1978), Borges *et al.* (2001), Brooks *et al.* (1993), Canevari *et al.* (1991), Cintra (1997), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Davis (1993), Di Giacomo (2004), Dubs (1992), Friedmann (1948), Gunski *et al.* (2000), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Joseph *et al.* (2004), Lanyon (1978), Lowen *et al.* (1996), Módena *et al.* (2000), Narosky & Salvador (1998), Narosky & Yzurieta (1993), Oren & Parker (1997), de la Peña (1987, 1988), Perry *et al.* (1997), Reynaud (1998), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), Robinson & Terborgh (1997), Schulenberg *et al.* (2001), Short (1975), Sick (1993, 1997), Snyder (1966), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Terborgh *et al.* (1984), Tostain *et al.* (1992), Tubelis (1998), Tubelis & Cavalcanti (2001), Zimmer, J.T. (1938), Zimmer, K.J. & Hilty (1997), Zimmer, K.J. *et al.* (1997).

382. Apical Flycatcher

Myiarchus apicalis

French: Tyran à queue givrée **German**: Kolumbienschopftyrann **Spanish**: Copetón Apical

Taxonomy. *Myiarchus apicalis* P. L. Sclater and Salvin, 1881, "Bogotá" = Honda, Tolima, Colombia.
Affinities uncertain, as present species not included in recent phylogenetic analysis of genus; it is predicted that it is probably either sister to *M. ferox* and *M. phaeocephalus* or paraphyletic with them. Monotypic.
Distribution. Upper parts of four river systems in WC Colombia: Cauca Valley (Valle and Cauca, one record from Antioquia), Pacific slope in arid valleys of upper R Dagua (Valle), upper R Patía (Nariño and valley of R Calima), and Magdalena Valley (Santander and Boyacá S to Huila).



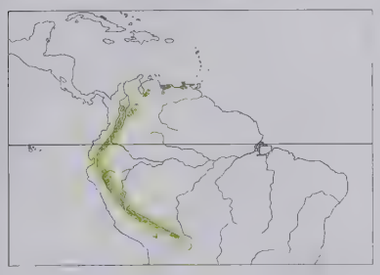
Descriptive notes. 17 cm; 26-33·5 g. The only *Myiarchus* with conspicuous pale whitish tail tips; crest more bushy than on most congeners. Crown is brownish-olive, darker feather centres creating streaked appearance, and contrasting slightly, if at all, with darkish olive upperparts; wings brownish, pale whitish to yellowish tips and outer edges of greater and median wing-coverts and outer edges of secondaries and tertials, faint yellowish outer edges of innermost primaries; tail brownish, pale creamy tips on all except central rectrices (at least 8 mm on outermost feathers), some rectrices sometimes fringed with olive-green; throat and breast grey, whiter on throat, breast side washed olive, rest of underparts yellowish, tibial feathering olive-brown; underwing-coverts yellow; iris, bill and legs dark. Sexes similar. Juvenile presumably has rufous edges on wing-coverts and rectrices. Voice. Repeated rolls, hiccups and whistles in response to intruding conspecifics; typically, gives long series of rolls without interjection of other vocalizations. Dawn song unknown.
Habitat. Most numerous in scrubby vegetation of dry to arid valleys; also recorded in forest and lighter woodland borders, riparian trees and brush. A farm study site embedded in a suburban area where a nesting pair was studied for several years was mainly pasture, with rice and sorghum fields, a few large trees (*Ceiba pentandra*, *Samanea saman*, *Erythrina glauca*), and some small shade trees 5-8 m tall (*Guazuma ulmifolia*, *Pithecellobium dulce*, *Fagara rhoifolia*). From 400 m to 2000-2500 m, primarily below 1700 m.
Food and Feeding. Insects and small fruit; a beetle (Coleoptera) found in one stomach. Singly or in pairs. Forages by sallying from perch at middle and lower levels.
Breeding. Laying recorded in Jul, Sept and Nov-Feb; males with enlarged testes late Jan to mid-Apr. Nests found in tree cavity 5 m up and in isolated stump in pasture, also in nestboxes. Following details refer to a pair studied Sept 1990 to Feb 1997 in a suburban area, where seven nesting attempts made (last of which in Jan 1995), all in nestboxes within area of 4 ha. Nest a base of sticks 5 cm deep, with layer of dry grass and fur on top and forming cup 7 cm across, lined with fur, feathers, snakeskin and pieces of plastic; mean clutch size 2·6 eggs; hatching asynchronous, 24 hours apart; nestling period 16-17 days. Female laid total of 18 eggs in seven clutches; four clutches fledged total of 11 young; two were preyed on, and outcome of the other was unknown. Female (ringed) remained in same pasture (26 km S of Cali, in Valle) for 6·5 years.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Colombian Inter-Andean Valleys EBA. Uncommon to locally fairly common. Common in upper Dagua Valley W of Cali (in Valle). Possibly expanding locally as secondary woodland, scrub and pasture replace cleared humid forest above 1700 m. Despite its relatively small range, it is therefore not threatened, but is not known to occur in any protected areas.
Bibliography. Anon. (2003g), Chapman (1917c), Cory & Hellmayr (1927), Hilty & Brown (1986), Kattan *et al.* (2000), Lanyon (1978), Meyer de Schauensee (1982), Miller (1947), Ridgely & Tudor (1994), Stotz *et al.* (1996).

383. Pale-edged Flycatcher

Myiarchus cephalotes

French: Tyran givré **German**: Andenschopftyrann **Spanish**: Copetón Montañero

Taxonomy. *Myiarchus cephalotes* Taczanowski, 1880, Tambillo, northern Peru.
Precise relationships within genus unclear from analysis of mitochondrial DNA; present species possibly sister to *M. ferox* and *M. phaeocephalus* (perhaps also with *M. apicalis*). Two subspecies recognized.
Subspecies and Distribution.
M. c. caribbaeus Hellmayr, 1925 - N & W Venezuela (N coastal range in Aragua and Distrito Federal, mountains of Sucre and N Monagas, Andes of Lara and Trujillo).
M. c. cephalotes Taczanowski, 1880 - Colombia (C range of Andes), Peru (slopes of E and C cordilleras) and Bolivia (Yungas).



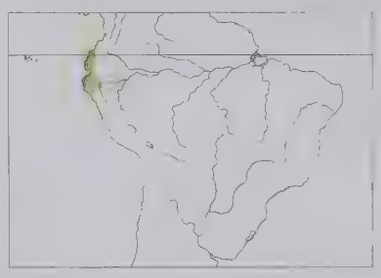
Descriptive notes. 18-19 cm; male 22·5-31 g, female 20·5-28 g (*cephalotes*), male 22·5-27·5 g, female 23-24·5 g (*caribbaeus*). The only *Myiarchus* with pale yellowish outer webs of outermost rectrices (often visible when viewed from below). Has crown brownish-olive, with slightly darker feather centres creating weakly streaked appearance, lores pale grey, upperparts olive-green; wings brownish-olive, yellowish tips and outer edges of greater and median wing-coverts, yellowish outer edges of secondaries and tertials (slightly more whitish on tertials); tail brownish-olive, with outer webs of outermost rectrices typically whitish and noticeably paler than the inner webs; throat and breast grey, slightly paler on throat; abdomen and undertail-coverts yellow, tending to be more richly coloured in middle of abdomen, tibial feathering olive-brown; underwing-coverts yellow; iris, bill and legs dark. Sexes similar. Juvenile has edgings of wing-coverts at least tinged with rufous, rufous margins on all but outermost rectrices, and tending to have rufous-brown tips on some feathers of upperparts. Race *caribbaeus* is smaller than nominate, and outer webs of outermost rectrices on average paler. Voice. Dawn song a series of piercing whistles given at intervals of at least 5 seconds; daytime contact call a similar whistle.
Habitat. Inhabits borders of moist and humid forests, clearings in forest, and open woodland. Occurs in subtropical and lower temperate zones, at 800-3000 m; 1400-2200 m in Venezuela (race *caribbaeus*).
Food and Feeding. Insects, including beetles (Coleoptera), wasps (Hymenoptera) and caterpillars; also berry seeds ("pits"). Sallies to hover-glean from foliage and branches; occasionally sallies in air.
Breeding. Breeds Apr-Jun in Venezuela and Colombia; males with enlarged testes and females with oviduct slightly enlarged and ova up to 2 mm in early May. In Colombia (near Popayán), an individual gathering plant fibres, presumably as nest material, and the same or another individual later seen to peer into nearby natural tree cavity. No other information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Uncommon to locally common. Fairly common in Serranías Cofán (Sucumbíos), in Ecuador, and along Maracay-Choroní pass, in Venezuela; occurs in Macarao National Park, in Venezuela, Tambito Nature Reserve and Cueva de los Guácharos National Park, in Colombia, Machu Picchu Historical Sanctuary, in Peru, and Madidi National Park, in Bolivia. Given its flexibility in habitat choice and its relatively large range, this species is not at any risk.
Bibliography. Chapman (1917c, 1921), Cory & Hellmayr (1927), Fjeldså & Krabbe (1990), Hellmayr (1925), Hennessey, Herzog & Sagot (2003), Hilty (2003), Hilty & Brown (1986), Joseph *et al.* (2004), Lanyon (1978), Meyer de Schauensee (1982), Perry *et al.* (1997), Renjifo *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Stotz *et al.* (1996), Traylor (1958), Walker (2001), Zimmer (1930, 1938).

384. Sooty-crowned Flycatcher

Myiarchus phaeocephalus

French: Tyran à front gris **German**: Rußkappen-Schopftyrann **Spanish**: Copetón Tiznado

Taxonomy. *Myiarchus phaeocephalus* P. L. Sclater, 1860, Babahoyo, Ecuador.
Phylogenetic analysis of mitochondrial DNA found one phenotypically typical individual of race *interior* more closely related to clade formed by *M. venezuelensis*, *M. panamensis* and *M. ferox* than to two nominate individuals of present species. Further study of decoupled molecular and morphological evolution needed. Races weakly differentiated. Two subspecies recognized.
Subspecies and Distribution.
M. p. phaeocephalus P. L. Sclater, 1860 - W Ecuador (S from N W Esmeraldas and W Pichincha) and NW Peru (S to Lambayeque).
M. p. interior J. T. Zimmer, 1938 - extreme SE Ecuador (near Zumba, in S Zamora-Chinchipe) and N Peru (upper R Marañón drainage in Cajamarca and Amazonas).



Descriptive notes. 18-19 cm; 24-29·5 g. The only *Myiarchus* with combination of blue-grey crown, greyish nuchal collar and olive-green back. Forehead and forecrown are light blue-grey, becoming darker grey on hindcrown and nape, dark centres of feathers creating streaked appearance (more pronounced on forecrown); lores and face slightly paler grey than crown; crown contrasts with lighter olive-green upperparts, often a light grey collar several millimetres wide between darker crown and lighter back; wings brownish-olive, tips of greater and median wing-coverts slightly paler, margins of tertials pale yellowish; tail brownish-olive, outer webs of outer rectrices paler, tending to yellowish-olive; throat and chest grey, marginally lighter on throat; abdomen and undertail-coverts light yellow, tibial feathering olive-brown, underwing-coverts yellow; iris, bill and legs dark; mouth-lining orange. Sexes similar. Juvenile apparently undescribed. Race *interior* differs from nominate only in slightly browner crown and back, slightly richer yellow abdomen, on average slightly shorter wing. Voice. Repeated hiccups, rasping whistles and high-pitched whistles in response to intruding conspecifics, the hiccup normally a disyllabic modification of the "huit" note given by many congeners; whistle notes during foraging. Dawn song a series of whistles as those when foraging during daylight, but given at more constant rate; initial whistle has piercing quality, remaining whistles more plaintive, declining in frequency and amplitude.
Habitat. Deciduous woodland, arid scrub, sometimes edge of mangroves in lowlands and foothills; tropical zone to c. 1500 m.
Food and Feeding. Insects. Sallies from tree perches.
Breeding. Breeds Feb-Apr; copulation observed Jan-Mar. Nest in cavity lined with fur, snakeskin and clear plastic, typical of genus. Mean clutch size 4 eggs. No other information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tumbesian Region EBA and Marañón Valley EBA. Uncommon to fairly common. Common in Chongon Hills, and also occurs in Machalilla National Park, Cerro Blanco Forest Reserve and Loma Alta Ecological Reserve, all in Ecuador; occurs in Northwest Peru Biosphere Reserve, in Peru. Forest habitats within Tumbesian region are being rapidly destroyed, degraded and fragmented. In W Ecuador below 900 m, deforestation rates of 57% per decade from 1958 to 1988; at higher elevations, deforestation has been slower, but still less than 5% of original forest cover remains, mostly on inaccessible slopes. Even protected areas are subjected to logging, livestock grazing, illegal settling and habitat clearance by people with land rights. Marañón drainage has also lost most of its original forest cover as a result of logging and agriculture, and no protected areas exist. This species' ability to live in scrub habitat should aid its future survival.
Bibliography. Best *et al.* (1996), Cory & Hellmayr (1927), Joseph *et al.* (2004), Lanyon (1978), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), Stotz *et al.* (1996), Wiedenfeld *et al.* (1985), Williams & Tobias (1994), Zimmer (1938).



PLATE 45

inches 3

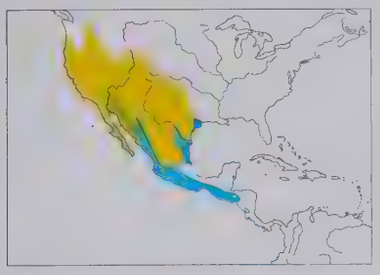
cm 8

385. Ash-throated Flycatcher

Myiarchus cinerascens

French: Tyran à gorge cendrée **German**: Kalifornien-Schopftyrann **Spanish**: Copetón Cenizo

Taxonomy. *Tyrannula cinerascens* Lawrence, 1851, western Texas.
Phylogenetic analysis of mitochondrial DNA placed this species in a clade with *M. yucatanensis*, *M. crinitus* and *M. tyrannulus*. Was in the past sometimes considered conspecific with *M. nuttingi*, but differs in mouth-lining colour, vocalizations, rectrix pattern, wing formula, and morphometrics; no evidence of hybridization between the two. Race *pertinax* differs slightly from nominate in average measurements, but not diagnosably distinct in plumage or vocal characters; perhaps represents end point of a cline and, as such, of doubtful validity. Two subspecies recognized.
Subspecies and Distribution.
M. c. cinerascens (Lawrence, 1851) - breeds W USA (C Washington, Idaho, Wyoming, W Colorado) S to C Mexico; winters from S USA to Honduras, mainly on Pacific slope.
M. c. pertinax S. F. Baird, 1859 - S Baja California (Mexico).



Descriptive notes. 19-20·5 cm; 24-31 g. Has crown and upperparts drab grey, crown feathers with dark centres (creating subtle streaked appearance); face and auriculars slightly paler than upperparts, lores pale grey, uppertail-coverts variably with rufescent tinge; wings browner, broad rufous outer edges of primaries, greyish-white outer edges of secondaries and tertials; greater and median wing-coverts broadly tipped greyish-white, creating two wingbars; rectrices, except central pair, with broad rufous band on inner webs but not extending to tips, tips and outer webs of rectrices greyish-brown, perhaps with olive tinge on edges; throat and breast ashy grey, grey sometimes extending around upperparts to form narrow grey collar; diffuse whitish band in lower breast/upper abdomen region, abdomen and undertail-coverts pale yellow (tending richer in centre of abdomen); tibial feathering olive-brown; underwing-coverts yellow; bare parts dark; inside of mouth pale ochraceous buff. Sexes similar. Juvenile has wing-coverts, uppertail-coverts, remiges and rectrices edged buff or cinnamon-rufous, underparts paler, tail lacking adult pattern. Race *pertinax* is not constantly different from nominate in plumage but tending paler on abdomen, and with wing shorter (by 3 mm) and more rounded, tail shorter (by 2 mm), bill slightly longer (by 0·3 mm), but overlap extensive. Voice. Sharp "bik" call, also "ki-brrrnk-brr"; short, soft "prrt" in non-breeding season. Song a repeated "kiprr", also short "kabrík". Dawn song repeated "ha-wheer"; dawn song of race *pertinax* reported as different, but not substantiated in more detailed study.
Habitat. Desert scrub (*chaparral*, thorn-scrub), open deciduous woodland and brushy pastureland (especially non-breeding season), coniferous and mixed woodlands (pinyon-juniper and oak), and riparian forest. Sea-level to 2000 m.
Food and Feeding. During breeding, almost solely small to medium-sized arthropods, primarily adult and larval insects; frequency of stink-bugs (Pentatomidae) in stomachs notable. On migration and on non-breeding grounds takes arthropods and small fruits. Rarely, captures small lizards (*Cnemidophorus communis*, scincids) and rodents (small mouse). Fruits recorded include those of saguaro, cardón, organ-pipe cactus, and mistletoe (Viscaceae) berries.
Breeding. From Mar, laying mostly from mid-Apr; timing later in N of range; usually single-brooded, but sometimes two broods in low-elevation desert habitats in S. Nest mostly of dry grass, stems, rootlets and various other vegetable material, lined with wool, hair and other soft material, placed in natural or artificial cavity of wide variety of types; in 3-year study of 33 nests in cylindrical metal fence poles 6-14 cm in diameter along highways in SE Arizona, most were attached to internal projections but in some cases the birds filled pole to desired height. Clutch 2-7 eggs, mean 4·3 eggs; incubation by female, period c. 14-16 days; chicks fed by both parents, leave nest at 13-17 days; fledglings fed by parents for up to 2 weeks. In Arizona study, nine of 15 active nests had dead eggs or young and only 40% were possibly successful; temperature often greater than 41°C (highest 49°C), almost certainly lethal.
Movements. Some apparently resident in parts of extreme SE California and S Arizona, Baja California and Sonora. Otherwise migratory; winters on Pacific slopes from Mexico S to Honduras. Leaves breeding grounds mostly Aug-Sept; returns Mar-May, earliest in low-lying areas in S. Casual to S Canada, E USA (especially Alabama and Florida) and Bermuda.
Status and Conservation. Not globally threatened. Fairly common to common. Estimated global population 8,900,000 individuals. Survey data show that the species increased by 94% overall between 1966 and 1993, with largest increases in the Sonoran Desert, Edwards Plateau, Chihuahuan Desert, Arizona, Utah and Texas; has been suggested that this apparent growth may be at least partly explained by earlier under-recording, although this thought unlikely by some authors. Local reductions and extinctions have occurred in response to habitat loss due to agriculture, urbanization, flood-control projects and planting of exotic vegetation in suburbs; very sensitive to loss of nesting cavities, both natural and artificial. At N of range US range, in Washington, preferred white oak (*Quercus garryana*) habitat is increasingly rare and local, and this tyrannid is now considered a "priority species" in the state. Loss and alteration of wooded habitats in wintering range may also have a negative effect.
Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bent (1942), Cardiff & Dittmann (2002), Contreras (1997), Cory & Hellmayr (1927), Davis (1961), DeGraaf & Rappole (1995), Dunning & Bowers (1990), Fair & Myers (1998), Finch (1991), Fitzpatrick (1980a), Hejl *et al.* (1995), Howell & Webb (1995a), Johnsgard (1979), Joseph *et al.* (2004), Kaufman (1996), Lanyon (1961, 1963a, 1963b), Monroe (1968), Nelson (1904), Peterjohn *et al.* (1995), Price *et al.* (1995), Ridgway (1907), Root (1988), Sauer & Droege (1992), Slud (1964), Small (1994), Stiles & Skutch (1989), Stotz *et al.* (1996), Udvardy (1963).

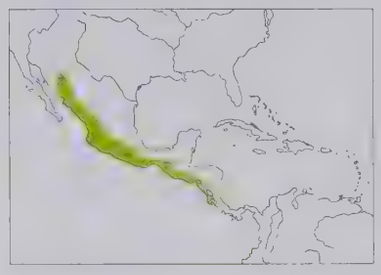
386. Nutting's Flycatcher

Myiarchus nuttingi

French: Tyran de Nutting **German**: Pazifischer Schopftyrann **Spanish**: Copetón de Nutting

Other common names: Pale-throated Flycatcher

Taxonomy. *Myiarchus nuttingi* Ridgway, 1882, La Palma de Nicoya, Guanacaste, western Costa Rica.
In the past sometimes considered conspecific with *M. cinerascens*, but differs in mouth-lining colour, vocalizations, rectrix pattern, wing formula, and morphometrics; no evidence of hybridization between the two. Nominate race intergrades with *flavidior* in S Mexico (Oaxaca), S Nicaragua and Costa Rica (Guanacaste), and with *inquietus* over larger zone in Oaxaca; all three races occur in both pure and hybrid forms in Oaxaca; complex pattern of zones of contact between races has not been assessed since 1961, and study urgently needed. Three subspecies recognized.
Subspecies and Distribution.
M. n. inquietus Salvin & Godman, 1889 - W & C Mexico (WC Sonora S to Chiapas, and E to S San Luis Potosí and Hidalgo).
M. n. nuttingi Ridgway, 1882 - arid interior valleys from S Mexico (Oaxaca and Chiapas) through Guatemala (R Motagua), Honduras (Choluteca and Comayagua Valleys) and W Nicaragua (arid slopes in vicinity of Matagalpa) to NW Costa Rica (tropical deciduous woodland of Guanacaste).
M. n. flavidior van Rossem, 1936 - Pacific lowlands of S Mexico (Oaxaca and Chiapas) S to NW Costa Rica.



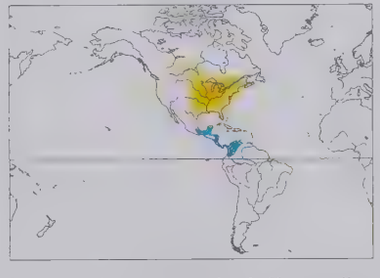
Descriptive notes. 18-19 cm; 21-23·9 g. Plumage is drab grey-brown above, paler and greyer on head side, uppertail-coverts with variable rufescent tinge; wings browner, rufous outer edges of primaries, greyish-white outer edges of secondaries and tertials, pale tips of greater and median wing-coverts (two wingbars); rectrices, except central pair, with small amount of rufous on inner webs; throat and breast grey, contrasting yellow abdomen and undertail-coverts; bare parts dark; inside of mouth orange. Sexes similar. Juvenile has extensive rufous on central rectrices and tips of wing-coverts. Race *inquietus* is larger than others; *flavidior* has richer yellow abdomen. Voice. Sharp "wheek" or "wheep", shorter than calls of *M. crinitus*; dawn song a varied series of 1-3 or more sharp calls followed by short, often accelerating, rolled chatter.
Habitat. Tropical deciduous forest and thorn woodland; arid to semi-arid scrubby woodland, semi-open areas with scrub and small trees, and interior and edge of deciduous and evergreen forest and second growth. Sea-level to 1800 m.
Food and Feeding. Insects and berries. Usually hunts from understorey to medium heights. Sallies and hovers within foliage to snatch food items; less often, hawks flying insects. Recorded at army-ant swarms.
Breeding. Few data. Nest a cup of fur, feathers, catkins, and shed skin of snake or lizard, placed in cavity (e.g. in fence post) 0·3-1·2 m above ground. Clutch 3-5 eggs.
Movements. Resident. Occasional wandering; vagrants recorded in NE Sonora, also in S USA (S Arizona, California, possibly New Mexico).
Status and Conservation. Not globally threatened. Uncommon to common. Occurs in Río Negro Jaguar Reserve and Tarcol Lodge, both in Costa Rica.
Bibliography. Anon. (1998a), Binford (1989), Bowers & Dunning (1987), Cory & Hellmayr (1927), Dickerman & Phillips (1953), Eisenmann (1955), Fitzpatrick (1980a), Fleming & Baker (1963), Gillespie & Walter (2001), Howell & Webb (1995a), Hutto (1992), Kaufman (1996), Land (1970), Lanyon (1961), McKee & Erickson (2002), Monroe (1968), Nelson (1904), Phillips (1960), Ridgway (1907), van Rossem (1936), Rowley (1984), Salvin & Godman (1892), Schaldach (1963), Slud (1964, 1980), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Vega-Rivera *et al.* (2003), Wetmore (1944), Zhang *et al.* (2003), Zimmerman (1978a).

387. Great Crested Flycatcher

Myiarchus crinitus

French: Tyran huppé **German**: Gelbbauch-Schopftyrann **Spanish**: Copetón Viajero

Taxonomy. [*Turdus*] *crinitus* Linnaeus, 1758, South Carolina, United States.
Phylogenetic analysis of mitochondrial DNA suggested that closest relatives are *M. yucatanensis*, *M. cinerascens* and *M. tyrannulus*, but relationships within this group not resolved. Birds from Massachusetts separated as race *boreus* on basis of bill size, but geographical variation considered clinal. Monotypic.
Distribution. Breeds S Canada (EC Alberta E to S Manitoba, extreme W & SE Ontario, S Quebec, New Brunswick, Nova Scotia, occasionally Prince Edward I) and E USA (from C North Dakota, NE & SW South Dakota, C Nebraska, NE Colorado, Oklahoma and S Texas); probably also extreme N Mexico (NE Coahuila). Winters in SE USA (S Florida), and S Mexico through Central America to N Colombia and NW Venezuela.



Descriptive notes. 21·5 cm; 27·2-39·6 g. Large, boldly marked *Myiarchus*. Plumage is olive-green above, crown with dark feather centres giving streaked appearance and producing some contrast with back; face and auriculars slightly greyer than crown; rufous-tinged uppertail-coverts; wings brown, outer edges of primaries margined with rufous, those of secondaries and tertials with greyish-white (a little yellower on tertials), inner edges of tertials light yellowish-cinnamon, greater and median wing-coverts broadly tipped greyish-white (two wingbars); central rectrices brown, others with innermost webs almost entirely rufous except for very narrow band of brown adjacent to and along length of rachis, outermost webs of outermost rectrices tending to pale greyish-white; throat and breast grey, sharply demarcated from bright yellow abdomen and undertail-coverts; upper flanks and side of lower breast occasionally washed green; tibial feathering olive-brown; underwing-coverts yellow; iris dark, bill dark with paler base to lower mandible, legs dark. Distinguished from *M. tyrannulus* and *M.*

On following pages: 388. Brown-crested Flycatcher (*Myiarchus tyrannulus*); 389. Galapagos Flycatcher (*Myiarchus magnirostris*); 390. Grenada Flycatcher (*Myiarchus nugator*); 391. Rufous-tailed Flycatcher (*Myiarchus validus*); 392. La Sagra's Flycatcher (*Myiarchus sagrae*); 393. Stolid Flycatcher (*Myiarchus stolidus*); 394. Puerto Rican Flycatcher (*Myiarchus antillarum*); 395. Lesser Antillean Flycatcher (*Myiarchus oberi*); 396. Flammulated Flycatcher (*Deltarhynchus flammulatus*).

cinerascens by fairly heavy bill, sharp contrast between dark grey chest and yellow belly, little contrast between face and olive crown, and inner webs of all but central rectrices entirely or largely cinnamon-rufous. Sexes similar, female slightly smaller than male. Juvenile is like adult but duller. Voice. Diagnostic vocalization a rising "wheee-eep" often given in excited series, "whee-up, wheee, whe-whe-whe-whe-wheeee-up!"; also, more modulated, rolling "whir-r-r-r-r-r-up". During courtship display, these calls given excitedly, often in syncopation, by both members of the pair perched less than 1 m apart, high in tree. Dawn song "wheee-up, whir-r-r-r-r-r-up" repeated over and over.

Habitat. Open deciduous woodlands and edges of clearings. Old orchards, wooded pastures and riparian corridors, wooded swamps, parks, cemeteries and urban areas with numerous large shade trees; isolated woodlots, second-growth woodlands, wooded hedgerows and selectively cut woodlands. Avoids boreal forest. Winters in wider range of wooded habitats, including borders and canopy of undisturbed humid forest, semi-arid forest and edge. In non-breeding season recorded to 1400 m in Costa Rica.

Food and Feeding. Insects and other invertebrates, also small berries and other fruits. Captures insects on wing by sallying from a perch, by outward hover-gleaning and by pouncing on ground from a perch.

Breeding. From Mar-Apr in S of range; later, from May-Jun, in N. Nest in natural or artificial cavity up to 1·8 m deep, filled with "trash"; nest constructed of leaves, petioles and wide variety of other fine plant matter, also hair, feathers, eggshell, pieces of shed snakeskin (incidence of snakeskin may vary geographically, often absent), and artificial materials such as paper and horse manure; natural cavity in dead tree preferred, but live tree, abandoned woodpecker (Picidae) hole and wide variety of artificial sites (pipe, lard bucket, tin can) also used. Clutch 4-8 eggs, usually 5; incubation by female (two records of male with apparent brood patch, presumably highly exceptional), period 13-15 days; chicks brooded by female, fed by both parents, leave nest at 13-15 days. Parasitized rarely by Brown Cowbird (*Molothrus ater*).

Movements. Migratory. Winters in SE USA (S Florida) and from S Mexico (S from S Veracruz and N Oaxaca) S to E Panama, also in W & N Colombia and NW Venezuela; rare in winter in Cuba and Bermuda, and reported also in NE Ecuador.

Status and Conservation. Not globally threatened. Fairly common to common. Estimated global population 7,500,000 individuals. Breeding range has expanded, especially in Canada, for unknown reasons. Survey data reveal no apparent trend between 1966 and 1994, with slight increases and declines in different states of USA. Possible competition for nest-sites with several species, e.g. introduced Common Starling (*Sturnus vulgaris*), and lack of suitable nest-sites locally (owing to forestry practice of clearing out old trees).

Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bangs (1898), Barbour (1943), Bent (1942), Cory & Hellmayr (1927), Cyr & Larivée (1995), DeGraaf & Rappole (1995), Faaborg & Terborgh (1980), Fjeldså & Krabbe (1990), Finch (1991), Fitzpatrick (1980a), Garrido & Kirkconnell (2000), Haffer (1975), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Johnsgard (1979), Joseph *et al.* (2004), Kaufman (1996), Lanyon (1997), MacDougall-Shackleton & Robertson (1995), Nelson (1904), Paynter (1995), Peck & James (1987, 1997), Peterjohn *et al.* (1995), Phillips (2003), Price *et al.* (1995), Raffaele *et al.* (1998), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robbins *et al.* (1985), Root (1988), Slud (1964), Smith, W.J. (2001), Stiles (1985), Stiles & Skutch (1989), Taylor & Kershner (1991), Udvardy (1963), Wetmore (1972), Willis (1980).

388. **Brown-crested Flycatcher**

Myiarchus tyrannulus

French: Tyran de Wied **German**: Braunschopftyrann **Spanish**: Copetón Tiranillo
Other common names: Wied's (Crested) Flycatcher, Rusty-tailed Flycatcher

Taxonomy. *Muscicapa tyrannulus* Statius Muller, 1776, Cayenne.

Phylogenetic analysis of mitochondrial DNA places this species in a clade with *M. yucatanensis*, *M. crinitus* and *M. cinerascens*. It further suggests that *M. nugator* (formerly treated as conspecific) together with Caribbean, N Venezuelan and Colombian populations of present species may warrant separation at species level (as *M. erythrocercus*); also, that remaining populations of South America (nominate race and *bahiae*) belong to a different clade; additionally, that currently recognized races of North and Central America fall into a third clade (that may warrant recognition as *M. cooperi*). Morphological diversity among all populations is low. Possibility, nature and extent of any interaction and intergradation in Honduras and El Salvador between *cooperi* and *brachyurus* require study. Island taxa *cozumelae* and *insularum* weakly differentiated morphologically. Race *bahiae* reportedly intergrades with nominate. Revision needed of circumscription of this species and the races within it. Seven subspecies currently recognized.

Subspecies and Distribution.

M. t. magister Ridgway, 1884 - S USA (SE California, S Nevada and SW Utah, W, SC & SE Arizona, SW New Mexico) and W Mexico (S to Pacific slope of E Oaxaca).

M. t. cooperi S. F. Baird, 1858 - S USA (S Texas) and E Mexico (S to interior E Oaxaca and E to Quintana Roo) S to N Honduras.

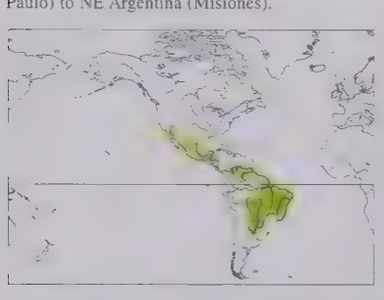
M. t. insularum Bond, 1936 - Bay Is (Utila, Bonacca, Roatán), off N Honduras.

M. t. cozumelae Parkes, 1982 - Cozumel I.

M. t. brachyurus Ridgway, 1887 - W Nicaragua and NW Costa Rica.

M. t. tyrannulus (Statius Muller, 1776) - N & E Colombia and S Ecuador E to Trinidad and Tobago, the Guianas and mouth of Amazon, and S of Amazonia in N & E Peru, Bolivia, S Brazil, Paraguay and N Argentina.

M. t. bahiae Berlepsch & Leverkühn, 1890 - lower Amazon Basin S through E Brazil (S to São Paulo) to NE Argentina (Misiones).



Descriptive notes. 20 cm; male 28·3-29·8 g and female 27·1-32·5 g (N *tyrannulus*), male 27-30·4 g and female 22·2-30 g (S *tyrannulus*), 23·9-32 g (*bahiae*), male 36·4-52·5 g and female 40·3-46 g (*magister*), male 32·7-45 g and female 30·7-40·7 g (*cooperi*), 41·9-43·6 g (*insularum*), 31·4-33·1 g (*brachyurus*). Large *Myiarchus* with conspicuous rufous in tail, two broad whitish wingbars. Plumage is greyish-brown above lacking marked olive or green suffusion, no marked contrast between crown and back; face and side of neck grey; primaries edged rufous-brown, narrow white edge on outer webs of inner secondaries, outer webs of tertials and greater and median wing-coverts broadly edged whitish, edges of inner webs of tertials pale rufous; inner webs of all but central rectrices conspicuously marked with rufous-brown (tail brown from below); throat and breast pale grey, tending to more whitish on throat; lower underparts yellow, tibial feathering olive-brown, underwing-coverts yellow; iris dark, bill dark often with paler base to lower mandible, inside of mouth yellow, legs dark. Sexes alike. Races differ mainly in degree of shading of upperparts and in size: *bahiae* putatively has less or no rufous on inner webs of outer rectrices (but distinction from nominate not constant); *cooperi* is larger than nominate; *magister* is largest of all, with relatively long body and large bill, also brighter yellow below; *insularum* is darker than previous two, especially on breast; *cozumelae* is darker still; *brachyurus* is smallest of North and Central American races. Voice. In response to intrusion by conspecifics, emits series of "huit" notes, rasps and slowly modulated whistles and rapid "huit" notes; "huit" is the most conspicuous and variable element of vocal repertoire. Isolated "huit" notes a conspicuous characteristic of dawn song, alternated with complex phrases derived from combination of "whay-burg" and brief series of rapid "huit" notes.

Habitat. Forest edge and woodland, including lowland riparian woodland, thorn woodland, second growth, and columnar-cactus woodland; tropical deciduous forest, gallery forest (including understorey), secondary forest, arid lowland scrub, *cerrado*. Also in mangroves in Colombia, Honduras, El Salvador; riparian forest dominated by cottonwood (*Populus*) and willow (*Salix*) in Arizona (USA); viny canopy of humid tropical forest along lake and river margins in W Amazonia. Sea-level to 1700 m; in Venezuela, to 1100 m N of R Ocinoco and 300 m S of it; to 1000 m in arid and drier habitats in Colombia.

Food and Feeding. During breeding takes almost exclusively arthropods, primarily insects (e.g. cicadids); rarely, lizards (e.g. *Anolis*). More omnivorous in non-breeding season, taking small fruit as well as arthropods. Recorded attempting to catch hummingbirds (Trochilidae), possibly in response to drought-induced food scarcity. Observed while feeding on *Ocotea pulchella* (Lauraceae) in Brazil (São Paulo). In Amazonia, recorded as taking food by gleaning, mostly performing upward strikes, less often outward and upward hovers, and rarely perch-to-ground pounces. Recorded at army-ant swarms.

Breeding. Mar-Aug in North America; Jan-Jul and Oct-Nov in N South America and Oct-Dec in S. Cavity-nester; nest lined with typical material such as hair, fur, feathers, snakeskin and plant material; deserted woodpecker (Picidae) hole often used, also natural hole in columnar cactus or tree; and once recorded as nesting in metal pipe. Clutch mostly 3-5 eggs, always 5 in study in Argentina (Mendoza); no information on incubation period; fledging 15 days at one nest; chicks fed by both parents. Parasitized by Shiny Cowbird (*Molothrus bonariensis*) in Argentina.

Movements. Partially migratory in USA and Mexico, also in S South America (details of movements unresolved). N populations of *magister* and *cooperi* winter in respective S halves of breeding ranges, latter S to El Salvador. Present in much of N Bolivia only in austral winter; similarly, appears to be present in adjoining Brazil (Acre, Rondônia) and Peru mostly Jun to early Oct at latest, but a record in SE Peru in late Nov. Mexican populations are migratory; winter records from Yucatán mainland may be based in large part on migrants from N. Race *cozumelae* absent from Cozumel I in winter, but winter range unknown.

Status and Conservation. Not globally threatened. Fairly common to common. Estimated global population 7,700,000 individuals. Survey data show that US breeding population increased substantially between 1966 and 1993, even though habitat loss, especially destruction of riparian habitats, caused local declines or extinctions. Concern has been expressed that Californian populations may suffer nest-site competition from introduced Common Starlings (*Sturnus vulgaris*), but this flycatcher seems able successfully to defend its nests; other potential concerns are further habitat loss, effects of invasive plants and wildfires. On a global scale, however, this species has a very large range and occurs in numerous protected areas.

Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bent (1942), Binford (1989), Bond *et al.* (1989), Brooks *et al.* (1993), Canevari *et al.* (1991), Cardiff & Dittmann (2000), Chesser (1995, 1997), Cintra (1997), Cory & Hellmayr (1927), Davis (1961), DeGraaf & Rappole (1995), Di Giacomo (2004), ffrench (1991), Fitzpatrick (1980a), Fjeldså & Maijer (1996), Francisco & Galetti (2002), Gillespie & Walter (2001), González *et al.* (1997), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Joseph *et al.* (2004), Kaufman (1996), Lanyon (1960, 1967b, 1978), Lowen *et al.* (1996), Marini *et al.* (1997), Mees (2000), Mezquida (2002), Miserendino (1998), Monroe (1968), Narosky & Salvador (1998), Nelson (1904), Parkes (1982), de la Peña (1988), Perry *et al.* (1997), Pinto & Camargo (1954), Price *et al.* (1995), Remsen (1978), Reynaud (1998), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), do Rosário (1996), Rosenberg *et al.* (1982), Rowley (1984), Short (1975), Sick (1993, 1997), da Silva *et al.* (1997), Slud (1964), Small (1994), Stiles & Skutch (1989), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Thurber *et al.* (1987), Tostain *et al.* (1992), Tubelis & Cavalcanti (2001), Vega-Rivera *et al.* (2003), Verea & Solórzano (1998), Verea *et al.* (2000), Voous (1983), Udvardy (1963), Wunderle (1981), Zimmer, J.T. (1938), Zimmer, K.J. & Hilty (1997), Zimmer, K.J. *et al.* (1997).

389. **Galapagos Flycatcher**

Myiarchus magnirostris

French: Tyran des Galapagos **German**: Galapagosschopftyrann **Spanish**: Copetón de Galápagos
Other common names: Large-billed Flycatcher

Taxonomy. *Tyrannula magnirostris* Gould, 1839, no locality = Chatham Island, Galapagos Islands.

Was formerly placed in a monotypic genus, *Eribates*, on basis of supposed "very long tarsus". Morphologically, appears most closely related to *M. tyrannulus*, but it was not included in recent phylogenetic analysis; in playback experiments has shown behavioural response to voices only of that species and *M. nugator*, further suggesting a close relationship to the "*M. tyrannulus* group". Monotypic.

Distribution. Galapagos Is: present on all main islands.



Descriptive notes. 15-16 cm. The smallest *Myiarchus* (wing less than 80 mm), looking like a diminutive *M. tyrannulus*. Plumage is olive-green above, faint rufescent tinge on crown; wings brown, little or no rufous or pale greyish-white fringing except on greater and median wing-coverts, which diffusely tipped with greyish-white; tail brown, inner webs of rectrices conspicuously marked with brown (at least 3 mm wide in adult); throat and breast grey, abdomen and undertail-coverts pale yellow, tibial feathering olive-brown; underwing-coverts yellow; iris dark, bill and legs dark. Sexes similar. Juvenile has rufous-tipped wing-coverts. Voice. Vocal responses to intruding conspecifics repeated "huit" notes, slowly vibrato-modulated whistles; dawn song principally a repeated complex phase with introductory "whay-burg" note and series of rapid "huit".

Habitat. Arid scrubland with cacti (*Opuntia*, *Jasminocercus*) and trees (*Bursera*, *Prosopis*); occasionally around saline coastal lagoons. Found from sea-level (rocks at high-tide line) to grassy areas (*Paspalum*) on mountaintops above 900 m; recorded to 1500 m.
Food and Feeding. Insects. Seen to feed in a large tree with red flowers (*Erythrina velutina*), but food items not noted. One record of moths (Lepidoptera) being fed to partially fledged young. Perches at all heights in vegetation, but frequently within 2 m of ground; sallies to ground for prey, and even settles on ground to search upward into overhanging vegetation, much more than other members of genus.
Breeding. Breeds Dec-Mar. Nest in cavity and lined with feathers, fur, small twigs and other plant matter, also hair; small sticks, particularly of *Cryptocarpus pyriformis*, crushed by cars on roadsides are often taken as nest material; chicken feathers commonly used; in one study, nests 1·5-3 m above ground in large cactus (*Opuntia echios*) or in hollow limb of *Jasminocereus howellii*, or to 6 m in citrus and other trees; of 18 nests found in one year, ten were in cactus, seven in electricity poles, and one in hood of a raincoat draped over interior half-wall inside a house; nests in native vegetation were all more than 100 m apart. Clutch 3-5 eggs, possibly once 6; no information on incubation and fledging periods. In one study of 18 nests, all but one were unsuccessful; nests lacking protection are abandoned after heavy rain.
Movements. Sedentary. One record of an individual on board a ship off Wolf I.
Status and Conservation. Not globally threatened. Restricted-range species: present in Galápagos Islands EBA. Entire range a national park, formally protected as a Biosphere Reserve and World Heritage Site. Has adapted well to human presence and urban environments. Concern has been expressed that avain populations generally on San Cristóbal (where this species occurs) might be susceptible to avian pox and crop canker (*Trichomanes gallinae*); an early report of "featherless swellings or tumours" at base of mandible; more data needed in order to place putative declines, which in some species have led to extinction on San Cristóbal, into longer-term perspective. In some areas, natural habitats threatened by overgrazing and fires, and the species may suffer some losses to introduced predators.
Bibliography. Butler (1979), Castro & Phillips (1996), Cory & Hellmayr (1927), Ervin (1992), Fitzpatrick (1985a), Gifford (1919), Harris (1973, 1982), Heinzel & Hall (2000), Joseph *et al.* (2004), Lanyon, W.E. (1985, 1978), Nelson (1968), Ridgway (1907), Rothschild & Hartert (1899), Salvin (1876), Sherborn (1897), Stotz *et al.* (1996), Swarth (1931), Swash & Still (2000), Vargas (1996).

390. Grenada Flycatcher

Myiarchus nugator

French: Tyran bavard **German**: Grenadaschopftyrann **Spanish**: Copetón de Granada

Taxonomy. *Myiarchus oberi nugator* Riley, 1904, Grenada, Lesser Antilles.
Phylogenetic analysis of mitochondrial DNA nested this species within *M. tyrannulus*; it further suggested that Caribbean, N Venezuelan and Colombian populations of latter, combined with present species, may warrant separation at species level (as *M. erythrocercus*). Was often treated in earlier literature as a race of *M. tyrannulus*; differs in bright orange inside of mouth, but is otherwise weakly differentiated. Monotypic.
Distribution. St Vincent, the Grenadines and Grenada, in S Lesser Antilles.



Descriptive notes. 20 cm; 37 g. Large *Myiarchus* with large bill. Plumage is brownish-grey above, with no marked olive or olive-green suffusion; outer webs of primaries edged cinnamon, outer webs of secondaries, tertials and greater and median wing-coverts broadly edged pale whitish, tending more fuscous on coverts (two pale brown wingbars); inner webs of all but central pair of rectrices conspicuously marked with rufous-brown (tail brown from below); throat and breast grey, tending paler on throat; abdomen and undertail-coverts washed-out lemon-yellow, tibial feathering olive-brown; iris dark, bill dark, inside of mouth bright orange, legs dark. Differs from *M. oberi* in having orange (instead of pale yellow) inside mouth, and most of secondaries fringed with grey or pale cream (instead of cinnamon). Sexes similar. Juvenile is probably duller than adult. Voice. Vocalizations lack prolonged plaintive whistles of Lesser Antillean congeners; also described as a loud "quip" or harsh "quek".
Habitat. Tropical lowland evergreen forest, secondary forest; open areas around settlements, especially near palms. Sea-level to 900 m.
Food and Feeding. Sallies into open to catch insects, often returning to same perch.
Breeding. Breeds Mar-Oct; gonads enlarged in late Mar, regressed in Jul. Nest in tree cavity, sometimes in open pipe. Clutch size 2-4. No other information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Lesser Antilles EBA. Common. Islands of Lesser Antilles have suffered large-scale destruction of forests as a result of agricultural and tourist development; destruction less severe on the mountainous islands, where forests more inaccessible. Several reserves exist within the species' range, but most are relatively small.
Bibliography. Anon. (1998a), Bond (1956b), Cory & Hellmayr (1927), DeGraaf & Rappole (1995), Faaborg (1985), Joseph *et al.* (2004), Lanyon (1967b), Raffaele *et al.* (1998, 2003), Ridgely & Tudor (1994), Ridgway (1907), Stotz *et al.* (1996).

391. Rufous-tailed Flycatcher

Myiarchus validus

French: Tyran à queue rousse **German**: Rostschwanz-Schopftyrann **Spanish**: Copetón Colirrufo

Taxonomy. *M[yiarchus] validus* Cabanis, 1847, "one of the West Indian islands" = Jamaica.
Formerly placed in a monotypic genus, *Hylonax* (and inadvertently in family Cotingidae), largely on basis of putatively distinctive non-exaspidean tarsus; tarsal scutellation, however, variable within present genus. Phylogenetic analysis of mitochondrial DNA places this species firmly within current genus, as basal sister to a radiation of primarily Caribbean and Central and North American taxa. Monotypic.
Distribution. Jamaica.
Descriptive notes. 24 cm; 38·6-43·2 g. Has crown smoky brown with, at most, faintly darker feather centres; face and lores slaty greyer; upperparts dull olive, contrasting with darker crown,



uppertail-coverts tinged rufous; outer webs of primaries and secondaries with broad (c. 2 mm) band of rufous, tertials have broader (3 mm) band on outer webs and with inner webs almost wholly suffused with rufous (some darker brown only on proximal parts of webs), greater and median wing-coverts broadly tipped rufous (wing appears mainly rufous when bird perched); all rectrices except central pair mostly rufous, with darker brown confined to thin band adjacent to and running along length of rachis, outer webs of central rectrices paler, outermost rectrix almost entirely rufous except for narrow band of darker brown adjacent to rachis on distal half; throat and breast dark grey and abdomen and undertail-coverts yellow, but strong greyish wash on upper breast (making demarcation between breast and abdomen indistinct); tibial feathering olive-brown, underwing-coverts rufous; iris dark, bill dark with paler base to lower mandible, inside of mouth bright orange, legs dark. Distinguished from *M. barbirostris* and *M. stolidus* by generally rufous wings, larger size. Sexes similar. Juvenile has whitish underparts. Voice. Distinctive short, piercing whistled notes, "pree-ee-ee-ee-ee" like the neigh of a horse, given frequently in territorial defence, with occasional disyllabic "wick-up" or clicking note; dawn song undescribed.
Habitat. Various forest types and wooded hills; also dry scrub and secondary forests. Primarily middle elevations, above c. 300 m, to 2000 m; less frequently at highest elevations.
Food and Feeding. Feeds on fruits and insects; latter include cicadas (Cicadidae) and moths and butterflies (Lepidoptera). Sallies for prey from perches in dense vegetation beneath canopy.
Breeding. Breeds Apr-Jul; gonads small/regressed in Jul and Aug. Few reports of nests; materials include grass and leaves (no reports of snakeskin), placed in cavity or stump of tree; old reports of supposedly unusual placement in fork or indentation or decayed hollow near top of tree probably fall within range of variation expected of genus. Clutch 3 or 4 eggs, sometimes 5. No other information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Jamaica EBA. Fairly common. Was apparently particularly common in interior of St Ann and Trelawny Parishes in first half of 20th century. In Jamaica, 75% of original forest cover has already been cleared, and remaining forest largely second growth; undisturbed forest survives only on high steep mountain slopes, some of which are protected in the Blue Mountain and John Crow National Park, but hunting and habitat destruction continue because of lack of funds for protection and management. Resurgence in coffee cultivation during last 20 years has led to clearance of much second growth; other problems include hurricane damage, widespread pesticide use, establishment of pine (*Pinus*) plantations, timber removal, deliberate fires, and continuing conversion for small-scale farming and urbanization. Not known whether recent habitat change has constricted the range.
Bibliography. Anon. (1998a), Bond (1956b, 1985), Cory & Hellmayr (1927), Faaborg (1985), Joseph *et al.* (2004), Lanyon, W.E. (1967b, 1985), March (1863), Pregill *et al.* (1991), Raffaele *et al.* (1998, 2003), Ridgway (1905, 1907), Stotz *et al.* (1996).

392. La Sagra's Flycatcher

Myiarchus sagrae

French: Tyran de La Sagra **German**: Kubaschopftyrann **Spanish**: Copetón de De La Sagra
Other common names: Cuban Crested Flycatcher (*sagrae*); Bahama Flycatcher (*lucaysiensis*)

Taxonomy. *Muscicapa sagrae* Gundlach, 1852, Cuba.
Has been considered conspecific with *M. stolidus*, but usually treated as separate species on basis of vocal characters. Phylogenetic analysis of mitochondrial DNA found nominate race to be more closely related to nominate race of *M. stolidus*, with race *dominicensis* of latter being sister to race *lucaysiensis* of present species. Interestingly, dawn song of nominate *M. stolidus* is similar to that of both races of present species. Two subspecies recognized.
Subspecies and Distribution.
M. s. lucaysiensis (H. Bryant, 1867) - Bahamas (Abaco, Andros, Grand Bahama, Green Cay, Inagua, New Providence).
M. s. sagrae (Gundlach, 1852) - Cuba, I of Pines and Grand Cayman I.



Descriptive notes. 19-22 cm; 17-21g. Has unusual leaning posture and flat-headed appearance. Nominate race has crown smoky olive-brown, slightly lighter on forecrown, and contrasting with more olive-brown back, mantle and scapulars; uppertail-coverts slightly more rufescent than back; wings brown, outermost webs of primaries thinly margined with rufous, outermost edges of secondaries and tertials pale greyish-white (tending paler on tertials), greater and median wing-coverts diffusely tipped greyish-white (indistinct wingbars); tail mainly brown, rufous usually confined to rectrices 2 to 5 and most marked on 3 and 4; lores, throat, breast and upper abdomen pale ashen grey, perhaps slightly darker on lores; lower abdomen and undertail-coverts whitish, tending to yellower on undertail-coverts and lower flanks, tibial feathering olive-brown; underwing-coverts pale yellow, not so white as most of underparts (except perhaps undertail-coverts); iris dark, bill dark sometimes dusky, inside of mouth pale yellow, legs dark. Sexes similar. Juvenile likely with pale tips of wing-coverts either reduced or slightly tending to rufous, and more rufous in outer webs of outer rectrices. Race *lucaysiensis* is larger than nominate, has rufous in outermost rectrices, perhaps paler wingbars. Voice. No unmodulated, prolonged whistle in vocal repertoire. Nominate race song "weeet-ze-weer", call "huit". Race *lucaysiensis* dawn song a combination of modified "huit" note and rolling "brrr-r-r" with no whistled element.
Habitat. Pine (*Pinus*) woodland, scrub, evergreen forest, mixed woodland, dense thickets, mangroves and forests; at all available elevations, maximum recorded 1500 m.
Food and Feeding. Caterpillars, katydids (Tettigoniidae), other insects; also fruits and seeds. Typically, forages in understorey, mainly by snatching prey during hovering flights.
Breeding. Breeds Apr-Jul. Nest a cup of hair, feathers, plant fibres and other soft materials, in cavity of trunk, broken tree limb or bamboo stalk. Clutch 2-4 eggs. No other information.

Movements. Resident. Some wandering or dispersive movement; since early 1980s, race *lucaysiensis* recorded as vagrant in SE USA (Florida) in autumn, spring and winter (e.g., Biscayne National Park, Palm Beach, Birch State Park).
Status and Conservation. Not globally threatened. Common in most of range; uncommon in S Bahamas. Susceptible, at least on smaller islands, to natural and anthropogenic habitat loss, such as that caused by hurricanes and deliberate habitat destruction.
Bibliography. Anon. (1998a), Bangs (1916), Barbour (1943), Bradley (1985, 2000), Brudenell-Bruce (1975), Bryant (1867a), Buden (1987a), Cory & Hellmayr (1927), Emlen (1977), Faaborg (1985), Garrido & Kirkconnell (2000), Gundlach (1873), Joseph *et al.* (2004), Lanyon, W.E. (1967b, 1985), Miles (1967), Mlodinow & O'Brien (1996), Olson & Hilgartner (1982), Raffaele *et al.* (1998, 2003), Ridgway (1907), Robertson & Biggs (1983), Smith & Evered (1992), Stotz *et al.* (1996), Sánchez *et al.* (2003), White (1998).

393. Stolid Flycatcher
Myiarchus stolidus

French: Tyran grosse-tête **German**: Haitischopftyrann **Spanish**: Copetón Bobito

Taxonomy. *Myiobius stolidus* Gosse, 1847, Jamaica.
Has been considered conspecific with *M. sagrae*, but usually treated as separate species on basis of vocal characters. Phylogenetic analysis of mitochondrial DNA found nominate race to be more closely related to nominate race of *M. sagrae*, with race *dominicensis* as sister to race *lucaysiensis* of latter. Interestingly, dawn song of nominate race is similar to that of both races of *M. sagrae*. Two subspecies recognized.
Subspecies and Distribution.
M. s. stolidus (Gosse, 1847) - Jamaica.
M. s. dominicensis (H. Bryant, 1867) - Hispaniola (Haiti, Dominican Republic) and adjacent islands (Gonâve, Tortue, Grande Cayemite, Beata).



Descriptive notes. 20 cm; 19·3-26·3 g. Dark-backed *Myiarchus* with prominent wingbars. Nominate race has crown olive-green, only slightly (if at all) darker than back, mantle and scapulars; uppertail-coverts slightly lighter than rest of dorsal surface; face and lores similarly dark; wings brown, weak rufous outer edging on primaries, pale greyish-white outer edges of secondaries and tertials, greater and median wing-coverts broadly tipped pale greyish-white (two clear wingbars); tail brown, rufous on inner webs of all rectrices except outermost (sometimes present on proximal part of outermost); throat and breast ashen grey, abdomen and undertail-coverts yellow, variably demarcated from grey of breast; tibial feathering olive-brown; iris dark, bill dark, mouth-lining pale orange, legs dark. Sexes similar. Juvenile probably has rufous tips on wing-coverts. Race *dominicensis* is very like nominate, but rufous on inner webs of all rectrices (including outermost), throat and breast perhaps slightly darker. Voice. Dawn song shows some similarity to those of *M. sagrae* (of both races), middle and terminal components virtually idenical, introductory note is whistled. Prolonged and ascending whistled note a diagnostic part of daytime repertoire; also various other disyllabic and typical rasps, rolls and "huit" notes. Plaintive "jui" (*dominicensis*).
Habitat. Lowland forest and forest edges; arid woodland, scrub and mangrove forest. Pine (*Pinus*) woods and remnant pine forests but not in coffee plantations on Hispaniola. Less frequently in edges of wet mid-elevation forest. To at least 1800 m.
Food and Feeding. Insects captured from a twig or leaf while in flight, by outward hover-gleaning. Also, fruits plucked while hovering.
Breeding. Breeds Apr-Jun; gonads regressed in Jul and Aug. Nest in cavity in tree or in artificial structure (e.g. house). Clutch 3 or 4 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Jamaica EBA and Hispaniola EBA. Common. In Jamaica, 75% of original forest cover already cleared, and remaining forest largely second growth; undisturbed forest only on high steep mountain slopes, some of which are protected in the Blue Mountain and John Crow National Park, but hunting and habitat destruction continue because of lack of funds for protection and management. Resurgence in coffee cultivation during last 20 years has led to clearance of much second growth. Haiti is one of the world's most environmentally degraded countries, with remaining forests covering less than 1·5% of the land area, and only c. 10% of forests remain in Dominican Republic; there are only two small national parks in Haiti and c. 22 protected areas (and 15 new areas proposed) covering c. 16% of the land area in Dominican Republic, but lack of funds threaten their long-term survival. Habitat loss continuing throughout this species' range; problems include hurricane damage, widespread pesticide use, plantations of exotic trees, timber removal, deliberate fires, and continuing conversion for small-scale farming and urbanization.
Bibliography. Anon. (1998a), Bond (1928a, 1985), Bryant (1867b), Cory (1885), Cory & Hellmayr (1927), Dod (1987), Faaborg (1985), Gosse (1847), Joseph *et al.* (2004), Keith *et al.* (2003), Lanyon (1967b), Pregill *et al.* (1991), Raffaele *et al.* (1998, 2003), Ridgway (1907), Stotz *et al.* (1996), Wetmore & Swales (1931), Wunderle & Latta (1996).

394. Puerto Rican Flycatcher
Myiarchus antillarum

French: Tyran de Porto Rico **Spanish**: Copetón Puertorriqueño
German: Puerto-Rico-Schopftyrann

Taxonomy. *Tyrannus antillarum* H. Bryant, 1866, Puerto Rico.
Phylogenetic analysis of mitochondrial DNA indicates that this species is sister to *M. oberi*. Monotypic.
Distribution. Puerto Rico, Vieques, Culebra, and Virgin Is (St Thomas, St John, Tortola, Virgin Gorda).
Descriptive notes. 18·5-20 cm; 22-25·3 g. Most white-bellied *Myiarchus*, also with no rufous in tail. Crown is smoky olive-brown, contrasting with plainer brown back, mantle and scapulars; uppertail-coverts slightly more rufescent than back; outer edges of primaries rufous, outer edges of secondaries and tertials paler greyish, becoming increasingly paler on the tertials, greater and median wing-coverts broadly tipped greyish-white; tail brown, paler on outermost webs of outer



rectrices, rufous (when present) confined to tips on inner webs of most feathers; throat and breast ashen grey, streaked paler whitish-grey, pale grey extending to lores (which are nonetheless darker than throat); abdomen and undertail-coverts very pale yellowish-white, not well demarcated from breast, brownish wash on side of lower breast; tibial feathering olive-brown; underwing-coverts pale whitish-yellow; iris dark, bill dark, mouth-lining pale yellow, legs dark. Sexes similar. Juvenile probably has rufous tipping on wing-coverts. Voice. Distinctive plaintive whistle, "whee", not ascending but sometimes descending. Dawn song like that of *M. stolidus*, but terminal element not modulated. Dissyllabic "wick-up" is middle element of dawn song, and given during day.
Habitat. Tropical deciduous forest, arid lowland scrub, mangrove forest and borders, tropical lowland evergreen forest, coffee plantations, citrus groves. Sea-level to 800 m.
Food and Feeding. Mainly insects; also seeds and berries. Stomach contents of 40 birds in Dec-Aug c. 84% animal matter and 16% plant matter: Hemiptera, weevils (Curculionidae) and caterpillars comprised bulk of animal food, which also included orthopterans, various coleopterans, hymenopterans, Mollusca, also single specimens with *Anolis* lizard and *Eleutherodactylus* frog; dominant vegetable matter mainly seeds of wild fruits or berries, and one bird had eaten 36 grass seeds (*Paspalum*). Inconspicuous and inactive, often noticed only by voice. Foraging techniques not well known; insects at least sometimes captured on wing.
Breeding. Recorded Feb-Jun; inspecting nest holes in latter part of Apr and May; three recently fledged young seen in early Jul. Nest of plant stems, lined with finer materials (shed snakeskin not recorded), built in tree cavity or open stump; nestbox also used. Clutch 3-5 eggs; no information on incubation and fledging periods. In one study, 11 of 13 nests were parasitized by Shiny Cowbird (*Molothrus bonariensis*), and 13 young fledged from total of 41 eggs laid (mean clutch size 3·2); in another study, using nestboxes that virtually excluded predators, no reported parasitism, and mean clutch size 4·58; of 114 eggs recorded over two seasons in a further study, 103 (90·3%) hatched.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Puerto Rico and the Virgin Islands EBA. Common in Puerto Rico, fairly common on Vieques; in Virgin Is, uncommon on St John and rare on Culebra, St Thomas, Virgin Gorda and Tortola. Occurs in Guanica International Biosphere Reserve, in Puerto Rico. Susceptible to habitat loss due to either natural (hurricanes) or anthropomorphic (vegetation clearance) causes and, potentially, to brood parasitism. Declines in populations on Puerto Rico and Vieques had been attributed to 1928 hurricane (nearly extirpated from former), but has since recovered. Only 15 individuals recorded on St Thomas in 1943. Has declined in the Virgin Islands following habitat destruction. High rates of brood parasitism by Shiny Cowbirds have been documented.
Bibliography. Anon. (1998a), Biaggi (1983), Bond (1956b, 1985), Cory & Hellmayr (1927), Faaborg (1985), Joseph *et al.* (2004), Lanyon, W.E. (1967b, 1985), McCandless (1958), Raffaele (1989), Raffaele *et al.* (1998, 2003), Ridgway (1907), Staicer *et al.* (1996), Stotz *et al.* (1996), Torres Báez & Collazo (1992), Wetmore (1916), Wiley (1985, 1988).

395. Lesser Antillean Flycatcher
Myiarchus oberi

French: Tyran janeau **German**: Kleinantillen-Schopftyrann **Spanish**: Copetón de Ober
Other common names: Guadeloupe Flycatcher (*oberi*)

Taxonomy. *Myiarchus Oberi* Lawrence, 1877, Dominica, Lesser Antilles.
Phylogenetic analysis of mitochondrial DNA indicates that this species is sister to *M. antillarum*; further, unpublished analysis also suggests that race *sclateri* is sister to the other three races. Earlier authors treated *sanctaeluciae* as a race of *M. tyrannulus* and *sclateri* as a race of *M. stolidus*. General clinal increase in size from N to S, but this this pattern "disrupted" on Martinique (*sclateri*). Four subspecies currently recognized.
Subspecies and Distribution.
M. o. berlepschii Cory, 1888 - St Kitts, St Christopher, Nevis and Barbuda.
M. o. oberi Lawrence, 1877 - Guadeloupe and Dominica.
M. o. sclateri Lawrence, 1879 - Martinique.
M. o. sanctaeluciae Hellmayr & Seilern, 1915 - St Lucia.



Descriptive notes. 19-22 cm; 23·3-37 g. Nominate race has crown and upperparts dark olive-green, uppertail-coverts with rufous edges; lores (especially), auriculars and face slightly greyer; wings brown, prominent rufous outer edges of primaries and inner edges of tertials, outer edges of secondaries and tertials slightly paler rufous, greater and median wing-coverts diffusely tipped greyish-white or rufous (faint wing-bars); outer webs of inner vanes of rectrices all with broad rufous stripe; throat and breast grey, tending to be paler on throat, rest of underparts yellow, washed greenish on flanks, and not sharply demarcated from grey of breast; tibial feathering olive-brown; underwing-coverts yellow; iris dark, bill dark, inside of mouth pale yellow, legs dark. Sexes similar. Race *sclateri* is most distinctive, smaller than others, lacks rufous in tail, wingbars perhaps least pronounced; *sanctaeluciae* is larger than nominate; *berlepschii* is smaller than previous, perhaps with paler yellow belly than nominate (and belly tends to be slightly richer yellow on Barbuda than on St Kitts and Nevis). Voice. Loud, prolonged plaintive whistles and also short whistles; dawn song like that of *M. antillarum*, but differing in lower frequency of whistled components and in configuration of "wick-up" note. Some individuals identifiable only by vocal characters.
Habitat. Primarily edges and canopy of dense woodland, "modified" thorn-scrub, forests and tree plantations at or above 100 m; much less frequently in second growth or scrub at lower levels. Recorded to 900 m.
Food and Feeding. Insects and small fruit. Perches vertically for medium to long periods amidst vegetation, bowing head to peer about in search of prey; takes insects primarily by hover-gleaning, also with upward strikes and short aerial sallies.

Breeding. Breeds Mar-Jul. Loose nest of plant fibres, feathers and plant down, built in tree cavity; suggestion of building cup-like nest in tree fork (instead of cavity) not wholly reliable. Clutch 3 to 4 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Lesser Antilles EBA. Generally common; rare on Guadeloupe. Islands of Lesser Antilles have suffered large-scale destruction of forests through agricultural and tourist development, less severe on the mountainous islands with inaccessible areas. Several reserves exist, but most are relatively small. Susceptible to habitat loss through both natural (hurricane damage) and anthropogenic (vegetation clearance) causes.
Bibliography. Anon. (1998a), Anthony (1997), Benito-Espinal & Hautcastel (1988), Bond (1956b), Cory & Hellmayr (1927), Faaborg (1985), Feldmann *et al.* (1998), Hellmayr & Seilern (1915), Keith (1997), Lanyon (1967b), Noble (1916), Pinchon (1963), Raffaele *et al.* (1998, 2003), Ridgway (1907), Stotz *et al.* (1996).

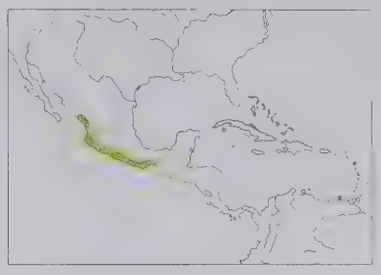
Genus *DELTARHYNCHUS* Ridgway, 1893

396. **Flammulated Flycatcher**

Deltarhynchus flammulatus

French: Tyran flammé **German**: Breitschnabel-Schopftyrann **Spanish**: Copetón Abejerillo

Taxonomy. *Myiarchus flammulatus* Lawrence, 1875, Cacoprieto, Oaxaca, southern Mexico.
Affinities uncertain; no molecular phylogenetic studies have yet included this genus. Currently considered closest to *Ramphotrigon*, differing in syringeal characters. Monotypic.
Distribution. Incompletely known. SW & S Mexico, from S Sinaloa S to Chiapas; populations in CW Chiapas (between El Sumidero and Tuxtla Gutiérrez, in Atlantic drainage of Cuenca Central) likely isolated from those along Pacific coast. Possibly also in Guatemala.
Descriptive notes. 15-16·5 cm; 17·2-20·5 g. Diminutive *Myiarchus*-like flycatcher with distinctive pale supraloral stripe, broken ocular ring, and streaked throat and chest. Plumage is olive-



green above, slightly darker greyish-olive on forecrown, faint nuchal collar; uppertail-coverts brown with broad rufous-cinnamon edges; wing feathers (except tertials) and tail feathers brownish, all broadly edged cinnamon, tertials edged lighter grey-brown; throat whitish and breast grey, both with dusky streaks, rest of underparts pale yellowish; tibial feathering olive-brown; iris dark, bill dark sometimes with pale base to lower mandible, inside of mouth orange, legs dark grey. Sexes similar. Juvenile has broader cinnamon edges on rectrices. Voice. In response to intruding conspecifics, emits a variety of pulsed notes, with sustained whistles, and with combinations of these two vocalizations. Dawn song various phrases each c. 1 second in length, given at intervals of 3 seconds, each phrase introduced by one of the daytime whistles, sometimes of a piercing variety and sometimes of the longer, more melancholic variety; the two types of whistles typically alternated.
Habitat. Dry deciduous woodland. Open thorny woodland dominated by mesquite (*Prosopis*) and acacia (*Acacia*), arid to semi-arid thorn-forest and scrubby woodland; coffee plantations. Sea-level to 1400 m.
Food and Feeding. Insects. Forages by outward hover-gleaning, similar to technique of *Myiarchus*.
Breeding. Recorded as carrying nesting material, copulating and laying in Jun. Single published description of cup-shaped nest, lining comprising solely fine vegetable fibres and small fragments of dried leaves and shredded bark (thus, unlike that of *Myiarchus* nests), in cavity but with incubating bird clearly visible (thus, much shallower than is normal for *Myiarchus*). Clutch 3 eggs (markings identical to those of *Myiarchus*). No other information.
Movements. Probably sedentary
Status and Conservation. Not globally threatened. Fairly common. Relatively poorly known; apparently disjunct distribution suggests that closer study of ecology and distribution is warranted.
Bibliography. Anon. (1998a), Binford (1989), Blake, E.R. (1953), Cory & Hellmayr (1927), Eisenmann (1955), Fitzpatrick (1980a), Howell & Webb (1995a), Hutto (1992), Lanyon, W.E. (1982b, 1985), Ridgway (1893, 1907), Salvin & Godman (1892), Schaldach (1963), Stotz *et al.* (1996).



PLATE 46

inches 4
cm 10

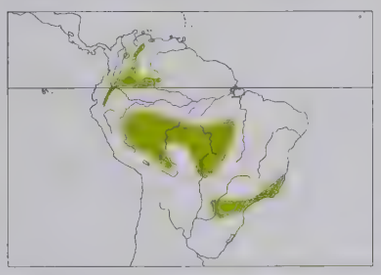
Genus *RAMPHOTRIGON* G. R. Gray, 1855

397. Large-headed Flatbill

Ramphotrigon megacephalum

French: Tyran mégacéphale **Spanish**: Picoplano Cabezón
German: Gelbbrauen-Breitschnabeltyrann
Other common names: Bamboo Flatbill

Taxonomy. *Tyrannula megacephala* Swainson, 1835, São Paulo, Brazil.
Present genus formerly believed to be allied to flatbills (*Tolmomyias* and *Rhynchocyclus*), but apparently belongs instead with *Myiarchus* and relatives, based on cranial, syringeal and nesting characters; molecular data still lacking. Present species formerly placed in genus *Tolmomyias*. Four subspecies recognized.
Subspecies and Distribution.
R. m. venezuelense Phelps, Sr & Gilliard, 1941 - NW Venezuela (W Trujillo, W Apure, W Barinas, NE Yaracuy, N Aragua), and probably into adjacent Colombia.
R. m. pectorale J. T. Zimmer & Phelps, Sr, 1947 - S Venezuela, SE Colombia and E Ecuador, probably also adjacent Brazil and Peru.
R. m. bolivianum J. T. Zimmer, 1939 - E Peru (S Loreto, Ucayali, Cuzco, Madre de Dios), Brazil (Amazonas, Mato Grosso and Pará S to Acre and Rondônia) and N Bolivia (Beni, La Paz, Cochabamba, NE Santa Cruz).
R. m. megacephalum (Swainson, 1835) - SE Paraguay (Canendiyu, Alto Paraná), NE Argentina (Misiones) and SE Brazil (E Minas Gerais and Espírito Santo S to São Paulo).



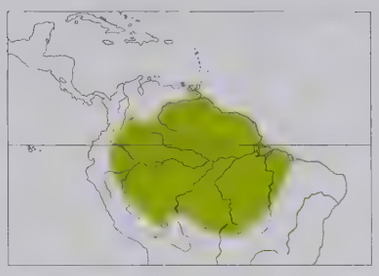
Descriptive notes. 12·5-13·2 cm; 13-15 g. Brown eye, flat black bill with basal third of lower mandible flesh-coloured, grey legs, slightly heavy-headed appearance. Has dark olive crown and upperparts, distinctive whitish to yellowish supraloral, eyering and faint postocular contrasting with dusky lores; wings and tail dusky, two prominent ochraceous wingbars, yellow-olive edging on flight-feathers and rectrices; whitish to yellowish throat, greyish-olive breast with faint yellowish streaks, pale yellow belly. Differs from *R. fuscicauda* in smaller size, slightly paler coloration, distinctive pale supraloral. Sexes alike. Race *venezuelense* darker than nominate, wing markings more cinnamon; *pectorale* has browner breast and more extensive yellow on belly; *bolivianum* has browner chest and duller yellow belly than nominate, top of head plain dusky greenish without pale markings. Voice. Call a soft mournful "wheé-whoo" (or "bam-boo") whistle, second note a semitone lower-pitched, heard throughout day, mostly in early morning and late afternoon, at intervals of 5-10 seconds; dawn song a continuous, rapidly uttered series of "tee-tu-twit" or "whu hu-hoowhip" whistles.
Habitat. Inside or at edge of humid seasonally inundated forest, usually closely associated with dense bamboo thickets and nearby dense understorey; also found in introduced Asian bamboo in disturbed plantations, e.g. in N Venezuela. To 1400 m.
Food and Feeding. Insectivore. Usually feeding alone, occasionally in mixed-species flocks. Perches quietly, and almost motionless, for long periods; then uses short forward or upward sallies to hover-glean prey from foliage or branches in relatively dense forest understorey to mid-storey, occasional aerial sallies.
Breeding. Nest and nestlings in Nov in Peru and juveniles in Nov-Dec in SE Brazil. Builds nest with ample material inside hole or cavity, e.g. one nest inside broken-off stump 1 m high, 10 cm deep and 6·5 cm wide. Clutch 2 eggs. No other information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to fairly common but very local. In seemingly disjunct populations in NW, C & CE South America. Much of its habitat remains in relatively pristine condition within its relatively large range. Occurs in many national parks and other protected areas.
Bibliography. Aleixo (1997), Aleixo *et al.* (2000), Allen (1995), dos Anjos *et al.* (1997), Bates & Parker (1998), Bates *et al.* (1998), Blake (1962), Brooks *et al.* (1993), Cadena *et al.* (2000), Canevari *et al.* (1991), Carrión & Sibley (1992), Clements & Shany (2001), Cory & Hellmayr (1927), Cracraft (1985), Graves (1988b), Ferreira de Vasconcelos (2003), Fitzpatrick (1980c, 1985a), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Karr *et al.* (1990), Kratter (1997), Lanyon (1988a), Lowen *et al.* (1996), Madroño & Esquivel (1997), Mazar Barnett *et al.* (1997), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Pacheco (1995), Pacheco & Laps (2001), Parker (1984), Parker & Goerck (1997), Parker, Donahue & Schulenberg (1994), Parker, Stotz & Fitzpatrick (1997), de la Peña (1988), Peres & Whittaker (1991), Remsen & Parker (1995), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schönwetter & Meise (1968), Sharpe *et al.* (2001), Sick (1993, 1997), Stotz *et al.* (1996), Zimmer, J.T. (1939c), Zimmer, K.J. *et al.* (1997).

398. Rufous-tailed Flatbill

Ramphotrigon ruficauda

French: Tyran rougequeue **Spanish**: Picoplano Colirrufo
German: Rostschwanz-Breitschnabeltyrann

Taxonomy. *Platyrhynchus ruficauda* Spix, 1825, "in sylvis fluminis Amazonum" = apparently mouth of River Madeira, Brazil.
Present genus formerly believed to be allied to flatbills (*Tolmomyias* and *Rhynchocyclus*), but apparently belongs instead with *Myiarchus* and relatives, based on cranial, syringeal and nesting characters; molecular data still lacking. Present species formerly placed in genus *Rhynchocyclus*. Monotypic.
Distribution. Entire Amazon-Orinoco Basin, including SE Colombia, S & E Venezuela (N to NE Monagas), the Guianas, NE Ecuador, E Peru, N Bolivia, and Amazonian Brazil.



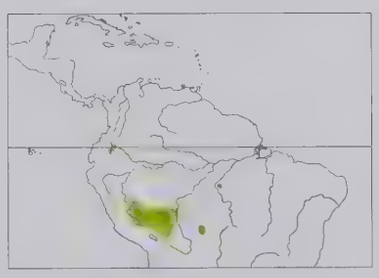
Descriptive notes. 15-16 cm; 17-22·5 g. Brown eye, flat black bill with basal third of lower mandible whitish, grey legs. Plumage is dark olive above; narrow whitish to yellowish supraloral, eyering and faint postocular; dusky wings, two broad wingbars and edges of flight-feathers bright rufous; tail bright rufous; throat greyish, underparts greyish-olive with indistinct pale yellow streaks, except for pale yellow central belly with olive streaks on sides, rufous undertail-coverts. Sexes alike. Voice. Song a soft drawn-out mournful whistle, "weeeaaaweeee", sometimes followed by shorter, lower-pitched and more abrupt flute-like "whoooooo" or plaintive drawn-out "wheeeer"; also undulating and slightly rising "püüeeeaaaeeeer". Song given at fairly long intervals throughout day; dawn song in Colombia an alternating mournful "toooo, reer, wheeee-ooh".
Habitat. Usually found in relatively open middle storey and undergrowth of humid *terra firme* or *várzea* lowland forest; in Colombia most common in sandy woodland (e.g. around Mitú), in Surinam also in savanna forest, and in Brazil in wooded *campina* (*campinarana*). To 600 m.
Food and Feeding. Insects, e.g. lepidopterans, hemipterans (including homopteran and heteropteran bugs), coleopterans, dipterans; also fruit. Usually alone or in pairs, rarely in mixed-species flocks, in forest understorey to mid-storey in more open parts of forest. Perches quietly, and almost motionless, for long periods; suddenly sallies forwards or upwards, or briefly flutter-hovers, to glean insects or pluck fruit from foliage or branches; occasional aerial sallies.
Breeding. Nest, eggs and nestlings in Aug in Peru; female with shell-less egg in oviduct in Oct in Surinam. Builds nest with ample material inside hole or cavity, e.g. inside a broken-off, half-rotten stump 40 cm high, 15 cm deep and 11 cm wide, cavity filled entirely with slender twigs covered by silky milkweed-like material. Clutch 3 eggs; chicks fed by both parents. No further information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Rare to locally fairly common. Has relatively large range within which much of its habitat is in reasonably good condition. Occurs in many national parks and other protected areas, e.g. Tinigua National Park, in Colombia, Caño Colorado (Monagas), in Venezuela, Kapawi and Sacha Lodges, in Ecuador, Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, several national parks and other reserves in Bolivia, and Jaú National Park, in Brazil.
Bibliography. Allen (1995), Bangs & Penard (1918), Bates & Parker (1998), Boesman (1995), Borges *et al.* (2001), Cadena *et al.* (2000), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Dubs (1992), Fitzpatrick (1980c, 1985a), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hennessey, Herzog, Kessler & Robinson (2003), Hilty (2003), Hilty & Brown (1986), Lanyon (1988a), Meyer de Schauensee (1982), Novaes (1978a), Oren & Parker (1997), Parker (1984), Parker *et al.* (1994), Peres & Whittaker (1991), Remsen & Parker (1995), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Terborgh *et al.* (1984), Thiollay & Jullien (1998), Tostain *et al.* (1992), Willard *et al.* (1991), Zimmer (1937a).

399. Dusky-tailed Flatbill

Ramphotrigon fuscicauda

French: Tyran à queue sombre **Spanish**: Picoplano Colioscuro
German: Dunkelschwanz-Breitschnabeltyrann

Taxonomy. *Ramphotrigon fuscicauda* Chapman, 1925, lower River Suno, E Ecuador.
Present genus formerly believed to be allied to flatbills (*Tolmomyias* and *Rhynchocyclus*), but apparently belongs instead with *Myiarchus* and relatives, based on cranial, syringeal and nesting characters; molecular data still lacking. Present species formerly placed in genus *Rhynchocyclus*. Monotypic.
Distribution. S Colombia (SW Putumayo), NE Ecuador (W Napo), C & E Peru (Junín and Ucayali S to Madre de Dios, Cuzco and Puno), N Bolivia and W & WC Brazil (Acre, Rondônia, Pará, Mato Grosso).



Descriptive notes. 15·5-16·5 cm; 16·5-21·5 g. Brown eye, flat black bill with pale base to lower mandible, grey legs. Plumage is brownish-olive above, crown darker, with narrow broken whitish eyering and supraloral; dusky wings and tail, two wingbars and flight-feather edgings cinnamon, tail feathers edged cinnamon-rufous; dark olive with coarse yellow streaks below, yellow central belly. Differs from *R. megacephalum* in larger size, darker plumage, yellower belly. Sexes alike. Voice. Call a drawn-out, descending "peeyooo-wheé" with distinct upward inflection at end; song a mellow mournful "peeeeu, tr'r'r, treey-treey-treey-treey", volume decreasing at end. Also a lazy "peeeeow-whooów", repeated several times.
Habitat. Dense and tangled undergrowth, e.g. near ravines or forest edges, and locally where there are *Guadua* bamboo thickets, in *terra firme*, *várzea* floodplain and swamp-forest, and secondary forest and edge; old overgrown marshes. To 900 m.
Food and Feeding. Insectivore. Usually alone or in pairs, rarely in mixed-species flocks. Perches quietly, and almost motionless, for long periods; uses short forward or upward sallies to hover-glean prey from foliage or branches in relatively dense forest understorey to mid-storey, often near light gaps. Of 23 foraging manoeuvres, most (65%) were upward strike, followed by downward strike (17%) and upward hover-glean (13%).
Breeding. Nest and eggs in Oct in Peru. Builds nest inside hole or cavity; e.g. cavity 0·5 m high inside broken-off, half-rotten limb of fallen tree trunk, filled entirely with mammalian hairs. Clutch 2 eggs. No further information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Very rare to locally uncommon, has fragmented distribution. Occurs in Archidona Natural Reserve, in Ecuador, Manu National Park and Biosphere

On following pages: 400. Rufous-tailed Attila (*Attila phoenicurus*); 401. Cinnamon Attila (*Attila cinnamomeus*); 402. Ochraceous Attila (*Attila torridus*); 403. Citron-bellied Attila (*Attila citriniventris*); 404. Dull-capped Attila (*Attila bolivianus*); 405. Grey-hooded Attila (*Attila rufus*); 406. Bright-rumped Attila (*Attila spadiceus*); 407. Cinereous Mourner (*Laniocera hypopyrra*); 408. Speckled Mourner (*Laniocera rufescens*).

Reserve and Tambopata-Candamo Reserved Zone, in Peru, Noel Kempff Mercado National Park, in Bolivia, and Rio Cristalino Forest Reserve and Tapajós National Park, both in Brazil.
Bibliography. Aleixo *et al.* (2000), Bates & Parker (1998), Bates *et al.* (1998), Cory & Hellmayr (1927), Fitzpatrick (1980c, 1985a), Hennessey, Herzog & Sagot (2003), Hilty & Brown (1986), Kratter (1997), Lanyon (1988a), Meyer de Schauensee (1982), Negret (2001), Oren & Parker (1997), Parker (1984), Parker *et al.* (1994), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stotz *et al.* (1996), Terborgh *et al.* (1984), Whittaker & Oren (1999), Zimmer, J.T. (1937a), Zimmer, K.J. *et al.* (1997).

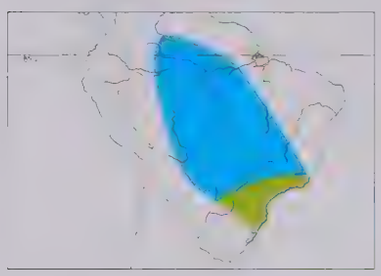
Genus *ATTILA* Lesson, 1830

400. **Rufous-tailed Attila**

Attila phoenicurus

French: Attila à queue rousse **German**: Graukopf-Attilatyrann **Spanish**: Atila Cabecigrís
Other common names: Grey-headed Attila

Taxonomy. *Attila phoenicurus* Pelzeln, 1868, Mato Dentro, São Paulo, Brazil.
Formerly placed in a monotypic genus, *Pseudattila*. Monotypic.
Distribution. Breeds in SE Brazil (Rio de Janeiro S to Rio Grande do Sul), probably also in NE Argentina (Misiones) and E Paraguay; migrants widely scattered in Paraguay, E Bolivia, C Brazil and N to S Venezuela during austral winter.



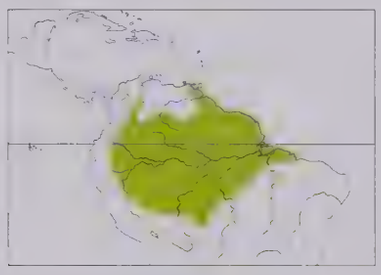
Descriptive notes. 17·6-18 cm; 32·3-34·5 g. Dark eye, dark brown to blackish bill shorter and rounder than in other attilas, usually with small white area at base at lower mandible. Dark grey head and nape contrast with deep rufous upperparts, slightly paler uppertail-coverts and tail; blackish primaries; cinnamon-rufous below, small whitish area on chin, broad but indistinct deep rufous breastband. Differs from *A. citriniventris* in rufous throat, more contrast between grey head and brownish back, darker rump. Sexes alike. Voice. Far-carrying and loud song "bee-bi, béé-bit" whistle, persistently repeated; also sonorous mewing "ew-éé-eh".
Habitat. Humid and mature secondary forest and edge, at least in some areas in *Araucaria*-dominated forest; also in scrub. To 1500 m.
Food and Feeding. Feeds from understorey up to canopy.
Breeding. No information.
Movements. Migrates during austral winter in NW direction into C & N South America; once observed as far N as S Venezuela.
Status and Conservation. Not globally threatened. Rare to locally common; perhaps often overlooked. Limits of breeding range imperfectly known. Particularly numerous in the Serro do Mar (São Paulo), e.g. at Fazenda Intervales, but rare at Saibadela Research Station in Intervales State Park. Occurs also in Fazenda Vale da Revolta (near Teresópolis and Macaé de Cima), Nova Friburgo, and in Aparados da Serra and Itatiaia National Parks. Has been recorded in Noel Kempff Mercado National Park, in Bolivia, and Ybycuí National Park, in Paraguay, but these records are perhaps of austral migrants.
Bibliography. Aleixo & Galetti (1997), dos Anjos *et al.* (1997), Bates & Parker (1998), Bauer & Pacheco (2000), Brooks *et al.* (1993), Canevari *et al.* (1991), Chebez (1994), Dubs (1992), Forrester (1993), Friedmann (1948), Hayes (1995), Hilty (2003), Joseph (1996), Mazar Barnett & Kirwan (1998c), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Narosky & Salvador (1998), Pacheco & Parrini (1997), Parker & Goerck (1997), de la Peña (1988), Ridgely & Tudor (1994), do Rosário (1996), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996).

401. **Cinnamon Attila**

Attila cinnamomeus

French: Attila cannelle **German**: Zimtattilatyrann **Spanish**: Atila Canelo

Taxonomy. [*Muscicapa*] *cinnamomea* J. F. Gmelin, 1789, Cayenne.
Has been considered conspecific with *A. torridus*. Monotypic.
Distribution. Entire Amazon-Orinoco Basin, including E Colombia, W, S & E Venezuela (N to SE Sucre), the Guianas, E Ecuador, E Peru, N Bolivia and Amazonian Brazil.



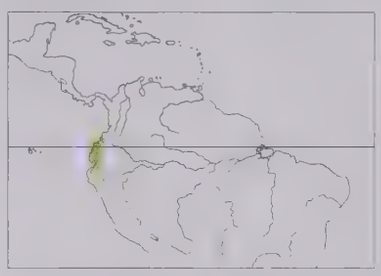
Descriptive notes. 19·5-20·3 cm; 28-45 g. Reddish-brown eyes, black bill, grey legs. Plumage is deep rufous above, no obvious contrast on rump; blackish primaries and dusky wing-coverts with broad rufous edges; cinnamon-rufous below, yellower on belly. Tail longer than that of congeners. Sexes alike. Voice. Call a loud ringing hawk-like whistle, "pü-puéééeeeear", rising and then descending and fading, often persistently repeated; also "whoo-whoo-wheeeyeér", more typical of genus. Song a loud ascending whistle "weary weary weary weer-ry", also slow, reedy series of 3 or more ascending "wheer" whistles, usually repeated persistently.
Habitat. Usually in wet places and near water, e.g. *várzea*, *igapó* and other swampy forests and edge, especially between sand ridges, around old lakes and flooded oxbows, along sluggish streams and on river islands; also wet plantations (e.g. coffee), and swampy palm groves and mangroves in river deltas. To 500 m.
Food and Feeding. Diet consists of larger arthropods, e.g. orthopterans, hemipterans (including homopterans), and also small amphibians; also takes fruit (e.g. *Guarea guara*). Feeds alone or in pairs, rarely in mixed-species flocks, often in the open and at forest edge, and mostly in forest mid-storey; also regularly lower and higher. Perches quietly, and almost motionless or hopping sluggishly, before suddenly sallying short distances or fluttering in order to glean items from foliage and branches.
Breeding. Eggs in Apr-May; nest-building also observed in Sept. Nest built by only one member of pair (Surinam), an open, shallow cup made of small dead sticks, lined with rootlets, placed in crevice in tree trunk or between trunk and bromeliads. Clutch 2-3 eggs. No further information available.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to locally common. Common in Jaú National Park, in Brazil. Occurs in many other national parks and other protected areas throughout its range, e.g. Caño Colorado (Monagas) and Alto Orinoco-Casiquiare Biosphere Reserve, in Venezuela, Tinigua National Park, in Colombia, Tambopata-Candamo Reserved Zone, in Peru, Beni Biosphere Reserve and Madidi and Noel Kempff Mercado National Parks, in Bolivia, and Rio Cristalino Forest Reserve and Tapajós National Park, in Brazil. Much of its habitat within its relatively large range remains reasonably undisturbed.
Bibliography. Bates & Parker (1998), Boesman (1995), Borges *et al.* (2001), Brace *et al.* (1997), Cadena *et al.* (2000), Cohn-Haft *et al.* (1997), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Novaes (1978a), Oren & Parker (1997), Parker *et al.* (1994), Peres & Whittaker (1991), Pinto (1948), Remsen & Parker (1995), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schönwetter & Meise (1968, 1969), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain *et al.* (1992), Zimmer (1936a).

402. **Ochraceous Attila**

Attila torridus

French: Attila ocré **German**: Ockerattilatyrann **Spanish**: Atila Ocre

Taxonomy. *Attila torridus* P. L. Sclater, 1860, Babahoyo, Los Ríos, Ecuador.
Has been considered conspecific with *A. cinnamomeus*. Monotypic.
Distribution. SW Colombia (SW Nariño), W Ecuador and NW Peru (Tumbes).



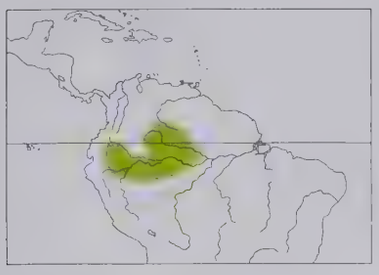
Descriptive notes. 20-22 cm; 46 g. Reddish-brown eyes, dusky bill, grey legs. Paler and yellower version of *A. cinnamomeus*. Has cinnamon-ochraceous head and upperparts; yellowish rump and base of tail; blackish primaries, two distinctive wingbars formed by dusky wing-coverts with broad ochraceous edges; yellowish ochraceous below, yellowest on belly. Sexes alike. Voice. Call a loud, clear, downslurred "whoeeeer" whistle, similar to call of Black Hawk-eagle (*Spizaetus tyrannus*), sometimes extended to "whoeeeer, wheéu, whit-whit"; also sharp "wheek" or "keek" call. Song a rising series of whistles, "wuuu-wuuu-weee-weee-weeé-weeé-wuyeép", in cadence similar to song of *A. cinnamomeus*.
Habitat. Humid and semi-humid forest and edge, second growth and adjacent clearings and plantations; to 1000 m, occasionally to 2400 m.
Food and Feeding. Arthropods (e.g. spiders) and fruit. Feeds alone or in pairs in forest mid-storey to canopy. Perches quietly and almost motionless, before suddenly sallying short distances or fluttering to glean items from foliage and branches.
Breeding. No information. Presumably breeds during wet season (Jan-Mar).
Movements. Probably sedentary; some authors have suggested the occurrence of seasonal movements, but the nature of these remains unclear.
Status and Conservation. VULNERABLE. Rare to locally uncommon. Known from c. 30 sites in W Ecuador and NW Peru; one 1958 record from SW Colombia. Global population of several thousand individuals; seriously declining and becoming increasingly fragmented in its relatively small range of c. 5000 km² owing to continuing deforestation. Below 900 m, only 4·4% of original forest cover remains in W Ecuador, with most of this destroyed since c. 1960. High levels of habitat loss are continuing, at least in unprotected areas, in both Ecuador and Peru, and all remaining lowland forest could soon be lost if effective action is not taken. In higher parts of the species' range, rates of habitat destruction have not been so great, but degradation by livestock grazing, logging and land conversion for agriculture and plantations continue. Even some protected areas adversely affected by grazing, illegal settling and deforestation. The species is somewhat tolerant of disturbance, as it is found in patchy forest fragments; nevertheless, strongholds are in reserves such as, in Ecuador, Machalilla National Park, where it is fairly common, Jauneche Biological Research Station, Río Palenque Science Centre, Loma Alta Ecological Reserve, and Tinalandia Private Reserve, and, in Peru, Northwest Peru Biosphere Reserve. Historical specimens originate from the area now protected as Cotacachi-Cayapas Ecological Reserve, and a concentration of known localities exists at Alamor and on W slope of Cordillera de Celica (both in Loja); reserves should be established here, as continued deforestation had left few forest patches greater than 50 ha ten years ago. Rare at Caberecas de Bilsa, in Esmeraldas, and at Manta Real (designated for protection), in Cañar.
Bibliography. Becker & López (1997), Begazo *et al.* (2001), Best & Clarke (1991), Best & Kessler (1995), Best *et al.* (1993), Clements & Shany (2001), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Cracraft (1985), Dodson & Gentry (1991), Hilty & Brown (1986), Meyer de Schauensee (1982), Negret (2001), Pacheco (2002d), Parker & Carr (1992), Parker *et al.* (1995), Renjifo & López (2002), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996), Walker (2002), Wege & Long (1995), Williams & Tobias (1994).

403. **Citron-bellied Attila**

Attila citriniventris

French: Attila à ventre jaune **German**: Gelbbauch-Attilatyrann **Spanish**: Atila Citrino

Taxonomy. *Attila citriniventris* P. L. Sclater, 1859, River Ucayali, Peru.
Monotypic.
Distribution. E Colombia (E Vaupés, E Guainía, E Amazonas), S Venezuela (C & S Amazonas), E Ecuador, NE Peru and NW Amazonian Brazil.
Descriptive notes. 18-18·5 cm; 30-38 g. Dark reddish-brown eyes, greyish upper mandible, pale horn to pinkish lower mandible with grey tip, grey legs. Dark grey of head and nape becomes rufous-brown on upperparts (including relatively short tail), except for paler cinnamon-rufous rump; dusky wings without wingbars; throat greyish-white, underparts bright ochraceous, faint dusky



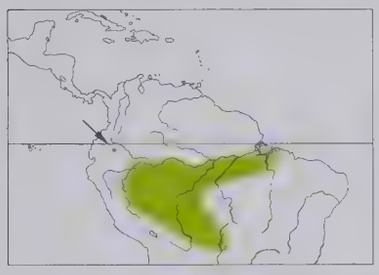
streaking on lower throat and breast, yellower on belly. Differs from *A. phoenicurus* in paler grey head, paler rump, whiter throat. Sexes alike. Voice. Song a series of c. 4-6 loud, rapid and slightly rising "whee" whistles followed by lower-pitched "wu", also a flat-pitched "whee-whee-whee-whee-whee", often persistently repeated. Response to playback lengthens song to 10 or more notes.
Habitat. Humid *terra firme* forest and edge; to 500 m.
Food and Feeding. Larger arthropods, also fruit. Usually alone, sometimes in mixed-species flocks, and at any height, but mostly in forest mid-storey and canopy. Perches quietly, before suddenly sallying short distances or fluttering to glean items from foliage and branches.
Breeding. No information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Rare to locally uncommon; perhaps often overlooked. Fairly common around Mitú (E Vaupés), in Colombia, and occurs in Amacayacu National Park, in Colombia, Alto Orinoco-Casiquiare Biosphere Reserve, in Venezuela, and Jaú National Park, in Brazil.
Bibliography. Borges *et al.* (2001), Cracraft (1985), Forrester (1993), Friedmann (1948), Hilty (2003), Meyer de Schauensee (1982), Pearman (1994a), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schönwetter & Meise (1969), Sick (1993, 1997), Stotz *et al.* (1996), Tostain (1980), Willard *et al.* (1991).

404. **Dull-capped Attila**

Attila bolivianus

French: Attila à calotte grise **German**: Weißaugen-Attilatyrann **Spanish**: Atila Ojiblanco
Other common names: White-eyed/Rufous/White-winged Attila

Taxonomy. *Attila bolivianus* Lafresnaye, 1848, Guarayos, Santa Cruz, Bolivia.
Two subspecies recognized.
Subspecies and Distribution.
A. b. nattereri Hellmayr, 1902 - SE Colombia (SE Amazonas), NE Ecuador (Sucumbíos, Napo), E Peru and C Brazil (both banks of lower Amazon E from left bank of lower R Madeira).
A. b. bolivianus Lafresnaye, 1848 - SW Brazil (SW Amazonas, SW Mato Grosso) and N Bolivia.



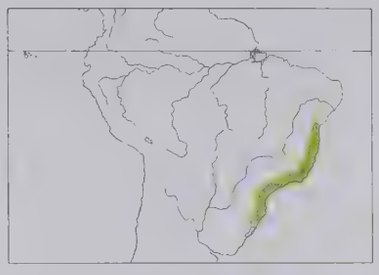
Descriptive notes. 19-22 cm; 40-45 g. Distinctive pale yellowish-white eyes, horn-coloured bill mostly pinkish-tinged below, blue-grey legs. Has rufous-brown head and upperparts, greyer on crown, bright cinnamon-rufous rump and tail; mainly blackish greater wing-coverts and primaries; cinnamon-rufous below, paler on belly, faint greyish chin. Differs from other Amazonian attilas (especially rufous morph of *A. spadiceus*) in larger size, longer bill and tail, and uniform cinnamon underparts. Sexes alike. Race *nattereri* is distinctly darker overall than nominate, with crown more sepia. Voice. Main song a leisurely ascending series of 4-8 "whéep" whistles followed by weaker and lower-pitched "wheeuu", often alternated with several "wée-per". Loud, sharp, rapid staccato rattle, "tu-tu-tu-tu-tu", when disturbed.
Habitat. *Várzea* and other swampy forests and edge, often along rivers or on river islands; also in gallery forest in the pantanal of Mato Grosso (Brazil). To 300 m.
Food and Feeding. Larger arthropods, also fruit. Feeds alone or in pairs, sometimes in mixed-species flocks, in open forest understorey and mid-storey. Perches quietly, almost motionless, before suddenly sallying short distances or fluttering and hovering to glean items from foliage and branches.
Breeding. Gonads enlarged in Sept, in SE Peru. Nest found in Jun in Colombia, a rusty-coloured mossy cup made from rootlets, moss and plant fibres, placed at base of epiphyte on trunk 1·3 m above water in *várzea* forest. Clutch 2 eggs. No other information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Given that much of its habitat within its relatively large range remains more or less undisturbed, it is not at any risk. Occurs in many national parks and other protected areas, e.g. Sacha and Yarina Lodges, in Ecuador, Explornapo Lodge (Loreto), Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, Beni and Pilón Lajas Biosphere Reserves and Madidi and Noel Kempff Mercado National Parks, all in Bolivia, and Mamirauá Reserve (Amazonas), in Brazil.
Bibliography. Allen (1995), Bates & Parker (1998), Brace *et al.* (1997), Dubs (1992), Fitzpatrick (1980c, 1985a), Forrester (1993), Hennessey, Herzog, Kessler & Robinson (2003), Hilty & Brown (1986), Howell (2002), Karr *et al.* (1990), Kirwan (1996), Meyer de Schauensee (1982), Naumburg (1930), Pacheco (1995), Parker *et al.* (1994), Remsen & Parker (1995), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Schönwetter & Meise (1969), Sick (1993, 1997), Stotz *et al.* (1996), Terborgh *et al.* (1984), Traylor & Fitzpatrick (1982), Willis & Oniki (1990).

405. **Grey-hooded Attila**

Attila rufus

French: Attila à tête grise **German**: Streifenkehl-Attilatyrann **Spanish**: Atila Encapuchado
Other common names: Grey-throated Attila

Taxonomy. *Tyrannus rufus* Vieillot, 1819, Cayenne; error = Rio de Janeiro, Brazil.
Two subspecies recognized.
Subspecies and Distribution.
A. r. hellmayri Pinto, 1935 - C & S Bahia, in E Brazil.
A. r. rufus (Vieillot, 1819) - SE Brazil, from E Minas Gerais and Espírito Santo S to NE Rio Grande do Sul.
Descriptive notes. 20-21 cm; 36·5-51·5 g. Dark eyes, rather long bill with whitish to greyish lower mandible, grey legs. Nominate race has grey head and nape contrasting with deep rufous back, paler cinnamon-rufous rump and tail; blackish primaries; grey throat with white streaks, contrasting with rufous breast and paler yellowish belly. Differs from *A. phoenicurus* in larger size, longer bill, grey throat faintly streaked whitish. Sexes alike. Juvenile has black bill. Race *hellmayri* has mostly rufous throat, whitish chin. Voice. Call an "éé-ew" whistle. Far-carrying and melodious song a series of 6-13 slowly delivered "wee" or "ewéé" whistles, pitch and volume gradually increasing before lowering on last whistle; also softer shorter "wee, tee-tee-pu" whistle that sometimes alternates with previous song. Warning a hard shrieking "tserétek, tsek".



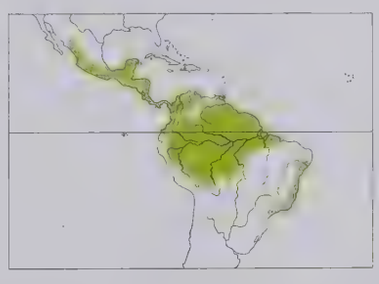
Habitat. Humid lowland and montane forest and edge, also scrub; to 1500 m.
Food and Feeding. Larger arthropods, e.g. ants (Hymenoptera), butterflies (Lepidoptera); tree frogs; also fruit. Feeds alone or in pairs, sometimes in mixed-species flocks, from ground (where relatively frequently found) up to canopy. Perches quietly, and almost motionless, before suddenly sallying short distances or fluttering and hovering to glean items from foliage and branches. Also reported as hammering on rotten wood.
Breeding. Little information. Builds bulky nest in tree trunk or tree-fern, also in tunnel-like cavity inside embankment.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to fairly common; apparently more common at lower elevations. Fairly common at Saibadela Research Station in Intervales State Park; occurs also in Mata dos Godoy and Rio Doce State Parks, Augusto Ruschi and Sooretama Biological Reserves, and Itatiaia and Tijuca National Parks.
Bibliography. Aleixo & Galetti (1997), dos Anjos *et al.* (1997), Bauer & Pacheco (2000), Cracraft (1985), Develey (2004), Forrester (1993), Guix *et al.* (1992), Meyer de Schauensee (1982), Parker & Goerck (1997), Ridgely & Tudor (1994), do Rosário (1996), Schönwetter & Meise (1969), Sick (1993, 1997), Simon (2000), Skutch (1971, 1981), Stotz *et al.* (1996), Venturini *et al.* (2001).

406. **Bright-rumped Attila**

Attila spadiceus

French: Attila à croupion jaune **German**: Gelbbürzel-Attilatyrann **Spanish**: Atila Polimorfo
Other common names: Polymorphic/Streaked Attila

Taxonomy. [*Muscicapa*] *spadicea* J. F. Gmelin, 1789, Cayenne.
Races differ vocally, with dawn songs falling into Middle and South American groups, suggesting that more than one species may be involved; further study required. Twelve subspecies recognized.
Subspecies and Distribution.
A. s. pacificus Hellmayr, 1929 - coastal W Mexico, from Sinaloa S to W Oaxaca.
A. s. flammulatus Lafresnaye, 1848 - SE Mexico (Veracruz and E Oaxaca E to S Quintana Roo), Guatemala, Belize and NC Honduras.
A. s. gaumeri Salvin & Godman, 1891 - N Yucatán Peninsula (SE Mexico), including islands of Holbox, Meco and Mujeres.
A. s. cozumelae Ridgway, 1885 - Cozumel I, off NE Quintana Roo.
A. s. salvadorensis Dickey & van Rossem, 1929 - El Salvador S to NW Nicaragua.
A. s. citreopygus (Bonaparte, 1854) - SE Honduras and Nicaragua S to W Panama.
A. s. sclateri Lawrence, 1862 - E Panama and adjacent NW Colombia.
A. s. parvirostris J. A. Allen, 1900 - N Colombia (Santa Marta region) and NW Venezuela (Maracaibo Basin).
A. s. caniceps Todd, 1917 - middle Magdalena and lower Sinú Valleys, in N Colombia.
A. s. parambae Hartert, 1900 - W Colombia S to NW Ecuador (S to Manabí and Pichincha).
A. s. spadiceus (J. F. Gmelin, 1789) - W & N Venezuela (Táchira, W Apure, SE Lara, and Falcón E to Aragua), Trinidad, and entire Amazon-Orinoco Basin from SE Colombia NE to the Guianas and S to E Ecuador, E Peru, N Bolivia and S Amazonian Brazil.
A. s. uropygiatus (Wied, 1831) - coastal E Brazil (Alagoas, S Bahia, Espírito Santo, Rio de Janeiro).



Descriptive notes. 17-21·5 cm; 31·4-44 g. Polymorphic, but always with two distinctive wingbars, yellow rump, and breast streaking; yellow to orangey-hazel to reddish-brown eyes, pinkish lower mandible with dusky base and tip, blue-grey legs. Nominate race has short yellowish supercilium; head and upperparts dark olive, rump bright yellow, tail dull rufous; dusky wings, two rufous-tinged wingbars; olive throat and breast with narrow yellow streaks, whitish belly, pale yellow crissum. Rufous morph has olive parts of plumage replaced with rufous, rump more orange-yellow, belly tinged cinnamon, no supercilium; grey morph substitutes olive with grey (except for olive back), has paler and greyer wingbars, no supercilium. Sexes alike, female with paler eyes than male. Juvenile has brown eyes (Costa Rica). Middle American races differ in having more cinnamon to brownish upperparts (with ochraceous rump in most N populations), greyish supercilium, more whitish to yellowish underparts with dusky streaking; *pacificus* rather pale, with bright cinnamon upperparts; *flammulatus* dusky rufous above, whitish central belly; *gaumeri* smaller and paler than previous, with proportionately larger bill; *cozumelae* similar to previous but with ochraceous rump, and deeper cinnamon-buff underwing-coverts; *salvadorensis* like *flammulatus* but very slightly paler; *citreopygus* variable, like *flammulatus* but smaller, with head more olive; *sclateri* like previous, but olive extends from head to back; *caniceps* like previous, but with greyer crown, and less yellow tinge to throat and breast; *parvirostris* has heavier bill, rufous-brown back, duller crown, and throat and breast strongly washed orange, also has rufous morph; *parambae* like *sclateri* but generally duller and darker; *uropygiatus* very similar to nominate, but larger with stronger, heavier bill. Voice. Both sexes sing. Dawn songs differ between Middle and South American populations: a series of emphatic and ascending "whée-dip" whistles (c. 5-7, but rather variable), usually followed by distinctly downslurred "whew" (South America) or a "whew-whit" (Middle America), this whistle often alternated with several "weed we-to" whistles, also increasing in pitch and volume and sliding off at end; these characteristic 2-note and 3-note phrases occur with numerous variations. Day songs differ from dawn songs, but are similar across entire range. Numerous

other vocalizations, e.g. loud and sharp "pi-dik" or "ki-di-dik", quiet "prrr" or "pi-rrrr" growls, also loud, sharp, rapid staccato "di-di-di-di" rattle when disturbed, and sharp harsh notes when foraging; a long series of low soft notes by incubating female ("nest song").
Habitat. Humid lowland forest (e.g. *terra firme*), swampy and foothill forest and edge, also second growth, clearings, plantations and gardens with tall trees, semi-arid deciduous forest and edge, scrubby woodland and bushy patches in savanna; occasionally in large gallery forests in *llanos*, and even pine (*Pinus*) forests. Usually below 1500 m, occasionally to 2100 m.
Food and Feeding. Mainly large arthropods and small vertebrates, especially frogs and lizards (e.g. *Anolis limifrons*, *Lygosoma cherriei*); also small fruits and arillate seeds (e.g. *Alchornea costaricensis*, *Dipterodendron elegans*, *Davilla kunthii*). Analysis of 13 prey items taken from stomachs in SE Peru included: lizards (32%), Homoptera (cicadas 26%, planthoppers 8%), Coleoptera (16%), Lepidoptera (8%), and Arachnida (spiders 8%). Forages alone or in pairs, rarely in mixed-species flocks, at any height, even regularly on ground, but usually in from forest midstorey up to canopy. Perches quietly, and almost motionless, before suddenly sallying short distances or fluttering and hovering to glean food items from foliage and branches or from the ground.
Breeding. Mainly Mar-Jul in Central America, from Apr in Belize; nests from Mar (pair in breeding condition in Feb) in Colombia, and in Mar-Apr in Trinidad; eggs and nestlings in Sept in Surinam. Nest, built by female, an open, shallow and bulky cup, length and depth 8·3-8·5 × 3·8-4 cm, made of moss, small dead sticks, fine leaves, green fern fronds and rootlets, placed low down (usually not above 2 m) in crevice or cavity in tree trunk, between trunk and epiphytes or between butresses or stump sprouts, or in branch fork, bromeliad or mossy rock outcrop, or in roadside or streamside bank, often well outside forest. Clutch 2-4 eggs; incubation by female, period c. 18-19 days; chicks fed by both parents, nestling period c. 18 days.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Has relatively large range, within which extensive areas of suitable habitat remain in reasonably good condition. Conservation status of isolated E Brazilian race (*uropygiatus*) may merit investigation. Occurs in numerous national parks and other protected areas throughout most of its range.
Bibliography. Anon. (1998a), Bates & Parker (1998), Begazo (1995), Binford (1989), Borges *et al.* (2001), Cadena *et al.* (2000), Clements & Shany (2001), Cooper (1997), Cracraft (1985), Dickey & van Rossem (1938), England (2000), ffrench (1991), Fitzpatrick (1985a), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hennessey, Herzog, Kessler & Robinson (2003), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995a), Lee Jones (2004), Leger & Mountjoy (2003), Monroe (1968), Munn (1985), Olson (1997), Oren & Parker (1997), Parker (1993a), Parker & Carr (1992), Parker & Goerck (1997), Parker *et al.* (1994), Pérez & Villeda (2000), Remsen & Parker (1995), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Robbins *et al.* (1985), Robinson & Terborgh (1997), Salaman (1994), Schönwetter & Meise (1969, 1977), Sick (1993, 1997), Skutch (1971, 1981, 1985), Silveira *et al.* (2003), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Temple (2002), Terborgh *et al.* (1984), Tostain *et al.* (1992), Traylor & Fitzpatrick (1982), Wetmore (1972), White (2002), Willis (1980).

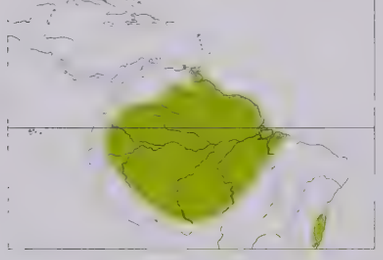
Genus *LANIOCERA* Lesson, 1840

407. Cinereous Mourner

Laniocera hypopyrra

French: Aulia cendré **German**: Grauer Tropfenflügeltyrann **Spanish**: Plañidera Cenicienta

Taxonomy. *Ampelis hypopyrra* Vieillot, 1817, La Guyane = Cayenne.
Genus often placed in Cotingidae, and possibly better treated in that family. Scientific name has often been misspelled as "*hypopyrrha*". Forms a superspecies with *L. rufescens*. Monotypic.
Distribution. Entire Amazon-Orinoco Basin, including SE Colombia, S & E Venezuela (N to SE Sucre), the Guianas, E Ecuador, E Peru, N Bolivia, and Amazonian Brazil; isolated population in SE Bahia and N Espírito Santo, in coastal E Brazil.



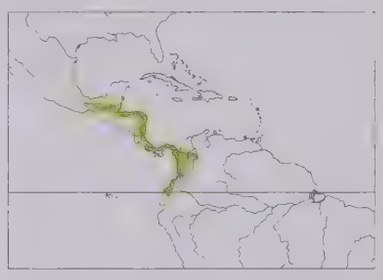
Descriptive notes. 20-21 cm; 41-51 g. Dark eyes with narrow orange eyering, dark bill, grey legs; rounded head and bill yielding appearance somewhat like that of a dove (Columbidae) or a thrush (Turdidae). Plumage is mainly grey, slightly paler below; brown-tinged primaries, two rows of large cinnamon spots forming broken wingbars, smaller cinnamon spots on tertials and tail tips; sometimes black-tipped orange spots on breast and crissum, latter rufous-tinged and faintly barred; orange or pale yellow pectoral tufts (often hidden). Sexes alike. Immature has some rufous intermixed with black spots on breast. Voice. Far-carrying, ventriloquial insect-like song a series of 10-15 very high-pitched, thin, drowsy and slurred "tee-o-weeét" whistles, first whistle often longer "cheeeeee-a-wee"; lengthy pauses between songs, but repeated persistently even during heat of day. Also series of 3-4 plaintive "teeéuw" whistles and a repeated "weet-jeh" shriek.
Habitat. Humid *terra firme* and *igapó* flooded forests, especially on sloping terrain or near ravine woodlands; also humid sandy-belt forests and more extensive savanna woodlands, and wooded sand ridges in coastal regions. To 900 m.
Food and Feeding. Arthropods, e.g. lepidopterans, dipterans; also fruit. Usually alone, sometimes in mixed-species flocks, usually in understorey or mid-storey. Perches quietly and almost motionless; uses short sallies or brief flutters and hovers to glean items from foliage or branches.
Breeding. Gonads enlarged Sept-Nov in Peru and Bolivia; nest Sept in SE Peru, bulky cup made of dry leaves, constructed among the branches of an epiphytic fern attached to tree trunk, 1·8 m above the ground, in 4-m tall tree under mature, floodplain forest in relatively open area with little vegetation cover in the understorey and no tall, woody plants within 2 m. Clutch 2 eggs, apparently tended by only a single individual.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Rare to locally fairly common. Fairly common in sandy-belt forest and savanna woodland in SE Colombia, e.g. around Puerto Inírida. Conservation status of small isolated population in E Brazil uncertain. Much of its habitat is in relatively pristine condition within its large range. Found in many national parks and other protected areas, e.g. Caño Colorado (Monagas) and Alto Orinoco-Casiquiare Biosphere Reserve, in Venezuela, Tinigua National Park, in Colombia, Kapawi Lodge, in Ecuador, Manu National Park and Biosphere Reserve and Tambopata-Candamo Reserved Zone, in Peru, and several large reserves both in Bolivia and in Brazil.
Bibliography. Bangs & Penard (1918), Bates & Parker (1998), Blake (1962), Boesman (1995), Borges *et al.* (2001), Brace *et al.* (1997), Cadena *et al.* (2000), Cohn-Haft *et al.* (1997), Friedmann (1948), Gilliard (1941), Haffer (1974), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Londoño (2003), Meyer de Schauensee (1982), Novaes (1978a), Oren & Parker (1997), Parker & Goerck (1997), Parker *et al.* (1994), Pinto (1948), Remsen & Parker (1995), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Terborgh *et al.* (1984), Tostain *et al.* (1992), Traylor (1977), Traylor & Fitzpatrick (1982), Walther (2002), Willard *et al.* (1991), Zimmer (1930, 1936a).

408. Speckled Mourner

Laniocera rufescens

French: Aulia tacheté **German**: Rötlicher Tropfenflügeltyrann **Spanish**: Plañidera Moteada

Taxonomy. *Lipaugus rufescens* P. L. Sclater, 1858, Cobán, Alta Verapaz, Guatemala.
Genus often placed in Cotingidae, and possibly better treated in that family. Forms a superspecies with *L. hypopyrra*. Three subspecies recognized.
Subspecies and Distribution.
L. r. rufescens (P. L. Sclater, 1858) - SE Mexico S to coastal NW Colombia.
L. r. griseigula Meyer de Schauensee, 1950 - NW Colombia (Córdoba, N Antioquia, Santander).
L. r. tertia Hartert, 1902 - SW Colombia (Cauca, W Nariño) and NW Ecuador (Esmeraldas, Pichincha).



Descriptive notes. 19-21·5 cm; 38·6-56 g. Dark brown eyes with narrow orange eyering, blackish bill with greyish-flesh base of lower mandible, brownish-grey legs. Plumage is mostly rufous-brown, slightly paler and more cinnamon below, usually with faint fine dusky scalloping on breast; pale yellow to orange pectoral tufts (often hidden); dusky wing-coverts, large rufous spots on tips forming two or three faint wingbars. Female usually lacks pectoral tufts. Immature resembles female, but with more prominent markings on wings and underparts, greyish wash on head, lower throat and back, sometimes sparse black breast spots. Race *griseigula* is slightly smaller and darker than nominate, duller cinnamon and rufous-brown, with central foreneck and upper breast grey; *tertia* similar to than nominate, but darker and more chestnut, particularly above. Voice. Ventriloquial and ringing song a series of up to 15 very high-pitched, thin "tlee-yeeí" whistles, given with lengthy pauses between songs, but repeated persistently even during heat of day. Also plaintive, drawn-out, slightly mewing "peeeeeeeu" with abrupt end.
Habitat. Humid and mature second-growth forest and edge, often near swampy places, ravines and streams; to 1000 m.
Food and Feeding. Diet consists of arthropods (e.g. lepidopterans), small lizards, and fruit. Usually forages alone, sometimes in mixed-species flocks, from understorey to subcanopy. Perches quietly, and almost motionless; use short sallies or brief flutters and hovers to glean food items from foliage or branches.
Breeding. No information. Birds in breeding condition in May in Colombia.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Rare to locally fairly common. In Panama, most common in Bocas del Toro. Probably locally extinct in areas where deforestation has been intense (e.g. in lowland forest in Chiriquí, in Panama). Considered "near-threatened" in Ecuador because of its rarity and strict dependence on large undisturbed forest tracts. Occurs in Columbia River Forest Reserve and Río Bravo Conservation and Management Area, in Belize, and Río Palenque Science Centre, in Ecuador; possibly present also in Awá Forest Reserve and Cotacachi-Cayapas Ecological Reserve, both in Ecuador.
Bibliography. Ceballos & Valdelamar (2000), Cracraft (1985), Haffer (1974, 1975), Hilty & Brown (1986), Howell & Webb (1992, 1995a), Jahn & Mena (2002f), Kricher & Davis (1992), Lee Jones (2004), Meyer de Schauensee (1982), Monroe (1968), Parker (1993a), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Vallely & Whitman (1997), Wetmore (1972).

PLATE 47 ➤

PLATE 47


inches 3
cm 8
ssp semifasciata
ssp costaricensis
ssp griseiceps
409
ssp nigriceps
ssp albitorques
ssp inquisitor
410
ssp fraserii
ssp buckleyi
ssp braziliensis
411
ssp cayana

Subfamily TITYRINAE

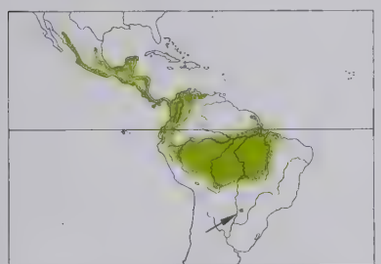
Genus *TITYRA* Vieillot, 1816

409. Masked Tityra

Tityra semifasciata

French: Tityre masqué **German**: Weißnackentityra **Spanish**: Titira Enmascarado

Taxonomy. *Pachyrhynchus semifasciatus* Spix, 1825, Pará, Brazil.
Genus formerly included with *Pachyramphus* in the Cotingidae, but transferred to the present family on the grounds of several shared, derived similarities of the skull and syrinx. Because of their similarity to cotingids in respect of many other features, some authors prefer to treat both genera as representing a separate family (Tityridae) or to leave them in Cotingidae. Phylogenetic affinity of genus and of this species currently unknown; molecular investigation needed. Nominate race and *fortis* intergrade in W Amazonia, such that distributional limit of each not entirely clear. Race *hannumi* often merged with *griseiceps*. Nine subspecies currently recognized.
Subspecies and Distribution.
T. s. hannumi van Rossem & Hachisuka, 1937 - NW Mexico (SE Sonora, SW Chiuahua, NE Sinaloa).
T. s. griseiceps Ridgway, 1888 - W Mexico (coast region from N/C Sinaloa and W Durango S to S Oaxaca).
T. s. personata Jardine & Selby, 1827 - E Mexico (SW Tamaulipas, SE San Luis Potosí, N Distrito Federal and N Puebla E to Yucatán), N & S Guatemala, Belize, W & C Honduras, El Salvador and NC Nicaragua.
T. s. deses Bangs, 1915 - SE Mexico (Yucatán).
T. s. costaricensis Ridgway, 1906 - SE Honduras, Nicaragua (except NC area), Costa Rica and W & C Panama (including Coiba I and Cébaco I).
T. s. columbiana Ridgway, 1906 - E Panama, N & W Colombia (Bolívar and Magdalena S to Chocó, N Antioquia and WC Santander) and NW & N Venezuela (Sierra de Perijá, Andes, and coastal range from Yaracuy E to Miranda).
T. s. nigriceps J. A. Allen, 1888 - extreme SW Colombia (Nariño) and NW Ecuador (Esmeraldas, Manabí, W Pichincha, W Guayas, Los Ríos, NW Azuay).
T. s. fortis Berlepsch & Stolzmann, 1896 - E Colombia (E slope of E Andes), E Ecuador (along base of E slope), E Peru (Loreto and San Martín S to E Ayachucho and Puno), N & E Bolivia (La Paz, Cochabamba and Beni E to Santa Cruz) and WC Brazil (Mato Grosso).
T. s. semifasciata (Spix, 1825) - French Guiana, Brazil (primarily S of Amazon in C & S Amazonas E to Pará, Amapá and N Maranhão, S to Acre, Rondônia, S Mato Grosso and N Goiás) and NE Paraguay (Canindeyú).



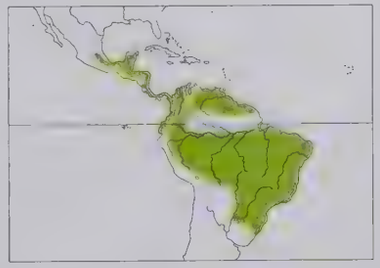
Descriptive notes. 20-24 cm; 77-88 g. Male has black mask with bare rosy-red facial skin and ocular area, narrowly surrounded by black feathers in area of forecrown, upper chin and face; rest of head and upperparts pale greyish-white, heavily tinged pearly grey; wings mostly black, greyish-white tertials; primary P9 very short, outermost primary normal; tail greyish-white, broad black subterminal band; throat and underparts more or less whitish; iris reddish-brown to brick-red; bill slightly hooked, rosy red, black terminally; legs blackish. Female has head more smoky or dusky brownish, no black mask, some brown smudging and streaking on dull and darker grey back, dingy and more pale greyish underparts. Juvenile resembles adult female, but has narrower whitish tips on rectrices, paler upperparts washed with brown; immature plumage acquired quickly, also like female but paler and greyer upperparts; adult plumage also attained quickly (Mar-Aug in Mexico). Races vary somewhat, but not well defined: considerable and apparantly irregular variation in nominate race towards *fortis*, with its longer and heavier bill; male *costaricensis* is nearly identical to nominate, but upperparts including median and lesser wing-coverts, tertials and base of tail more pale grey, female darker than nominate, especially on head; male *nigriceps* whiter than nominate, has slightly more black on face, sometimes black spotting on hindcrown, and broader black subterminal band on tail; male *griseiceps* is greyer above, female has pale grey head and upperparts, back washed grey-brown, paler and greyer on inner wing-coverts and tertials; *personata* fairly uniform grey above and below, with greyish-brown head and upperparts, darker on head; *deses* similar to nominate, but paler all over, especially on underparts; *columbiana* similar to nominate, but with less white at base of outer rectrices, female has browner upperparts. Voice. Typical call a distinctive buzzy, nasal, staccato, and croaking or clicking "zzzu rrk" or "zzr zzzrt" and "rr-rr-rrk", etc.; commonly a dry, nasal, and grunting or almost pig-like "querp" or "kuert", sometimes doubled "gurank-gureek" or "reek-reek" and "reek-rack", with second note a bit higher, or a longer and more rhythmic series of similar notes with two pitches, "ghe-rák-gherik"; also quieter "rruk, rruk" or "eg-eg" call, snorted "gaaaa", and variety of dry notes that recall some insect sounds. Male said to create sonorous hissing sound with wings, mostly when slowing in flight immediately before perching.
Habitat. Humid to semi-arid forest canopy and crown of taller trees along forest edges, woodland, palm stands, second growth, relatively open areas from forest clearings to savana with scattered trees, and plantations. Mostly below 1200-1500 m, but recorded up to over 1800 m in Panama (Chiriquí) and Venezuela, up to 2300 m on Pacific slope of Costa Rica, and up to 2500 m in W Mexico (Sinaloa).
Food and Feeding. Mostly frugivorous; some insects, occasionally small lizards. Observed singly, in loose pairs, or in small straggling flocks of 3-4 individuals. Generally perches conspicuously on a bare branch at middle to upper levels; rather antisocial, and often aggressive towards other birds. Consumes much fruit, including figs, arils (*Casearia*, *Trichilia*, *Virola*), and lauraceous fruits, usually by perch-gleaning, sometimes by sally-gleaning; one of many consumers and/or seed-dispersers of *Virola surinamensis* and *V. sebifera* (Myristicaceae) and *Guarea glabra* (Meliaceae) in Panama; also a primary disperser of *Casearia corymbosa* (Flacourtiaceae) in Costa Rica. Also sally-gleans, sometimes fluttering briefly, or perch-gleans large insects from foliage; occasionally pursues insect prey; also hops lethargically and heavily along branches and large limbs, looking for insect prey and fruit.
Breeding. Mar-Jul in Costa Rica, sometimes two broods; in Colombia, birds in breeding condition in Jan-May (in NW) and nest-building and cavity-occupancy behaviour observed Feb-Apr and Aug (Anchicayá Valley). Male, with stooped posture and drooping wings, runs back and forth on horizontal branch, while making croaking sound, in presence of female, which usually actively pursues male; up to 4 individuals displaying together near occupied nest. Nest, so far as is known built mostly by female, in tree cavity or old woodpecker (Picidae) hole at middle to upper levels, generally c. 12-30 m high, rarely as low as 3-4 m, cavity usually partly filled loosely with large quantity of dead leaves, twigs, inflorescences and other plant matter; sometimes nests in same tree as *T. inquisitor*. Clutch 2-3 eggs; incubation by female, eggs apparently covered with nest material when nest left temporarily unattended, period thought to be c. 18-21 days; chicks fed by both sexes, nestling period c. 20-30 days.
Movements. No significant movements known. Vagrant regularly observed in S USA (S Texas) Feb-Mar 1989, following a late-Dec freeze that extended far into Mexico.
Status and Conservation. Not globally threatened. Fairly common to common. Apparently more abundant W of Andes. Much suitable habitat for this remains in relatively pristine condition within its large range. Occurs in many national parks and other protected areas.
Bibliography. Anon. (1998a), Bates & Parker (1998), Binford (1989), Clements and Shany (2001), Cory and Hellmayr (1927), Haffer (1975), Hilty (2003), Hilty & Brown (1986), Hinojosa *et al.* (1998), Howe (1981), Howell & Webb (1995a), Land (1970), Lanyon (1985), Lee Jones (2004), Lowen *et al.* (1997), Lowery & Dalquest (1951), McKitrick (1985), Meyer de Schauensee (1966, 1982), Moermond & Denslow (1985), Monroe (1968), Novaes (1992), Olson (1997), Oren & Parker (1997), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989, 1994), Ridgway (1907), Robinson (1997), Rowley (1984), Salaman (1994), Schulenberg *et al.* (2001), Sibley & Ahlquist (1985c), Sick (1993, 1997), Skutch (1969), Slud (1964), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Terborgh *et al.* (1984), Tostain *et al.* (1992), Traylor (1977), Wetmore (1943, 1972), Willis (1980), Zimmer (1930, 1936b).

410. Black-crowned Tityra

Tityra inquisitor

French: Tityre à tête noire **German**: Schwarzschnabeltityra **Spanish**: Titira Piquinegro
Other common names: White-tailed Tityra ("*T. leucura*")

Taxonomy. *L[anius] Inquisitor*, M. H. K. Lichtenstein, 1823, São Paulo, Brazil.
Genus formerly included with *Pachyramphus* in the Cotingidae, but transferred to the present family on the grounds of several shared, derived similarities of the skull and syrinx. Because of their similarity to cotingids in respect of many other features, some authors prefer to treat both genera as representing a separate family (Tityridae) or to leave them in Cotingidae. Phylogenetic affinity of genus and of this species currently unknown; molecular investigation needed. In the past, was sometimes placed in a separate genus, *Erator*, with nominate race and *erythrogenys* then treated as forming one species, and *pelzelni*, *albitorques* and *buckleyi* as three further species. Form "*leucura*" was also described as a full species, based only on the type specimen (from R Madeira, in Brazil), but description indicates that it represents an abnormal subadult intermediate between *albitorques* and *pelzelni*, ranges of which apparently overlap in the area. A further named race, *selbii*, of S Brazil is considered inseparable from nominate. Although considerable variation exists among some races, exact limits and biological nature of such divergence require closer inspection; *fraserii* and *albitorques* appear to intergrade in Costa Rica. Six subspecies currently recognized.
Subspecies and Distribution.
T. i. fraserii (Kaup, 1852) - E & SE Mexico (extreme SE San Luis Potosí, NE Distrito Federal, NE & E Puebla and S Veracruz E to Yucatán Peninsula, S to N Oaxaca and N Chiapas) and N Guatemala S to C Panama (including islands of Espartal, Brava and Sevilla, off Chiriquí).
T. i. albitorques Du Bus de Gisignies, 1847 - E Panama, N & W Colombia (S to W Valle del Cauca, and Magdalena Valley S to N Huila), W Ecuador (S to Guayas and NW Azuay), N & C Peru (W Loreto, San Martín, Ayacucho), NW Bolivia (Pando, Beni) and NW Brazil (R Juruá and Amazon E to Manaus).
T. i. erythrogenys (Selby, 1826) - E Colombia (E of Andes from Norte de Santander, Arauca and Meta E to R Orinoco), N, C & S Venezuela (S Maracaibo Basin E to Sucre, W slope of Andes S from to Trujillo and E slope S from N Barinas, coastal mountains S to Guárico, also Amazonas and N Bolívar), Surinam, French Guiana and N Brazil (N of lower R Amazon); probably also Guyana.
T. i. buckleyi Salvin & Goodman, 1890 - SE Colombia (W Caquetá and Putumayo E to Amazonas) and E Ecuador (Napo, Pastaza).
T. i. pelzelni Salvin & Goodman, 1890 - N & E Bolivia (La Paz, Cochabamba, Santa Cruz) and WC & NE Brazil (S of Amazon, from left bank of R Madeira E to E Maranhão, S to Mato Grosso).
T. i. inquisitor (M. H. K. Lichtenstein, 1823) - E & SE Brazil (S Piauí and interior Bahia S to N Rio Grande do Sul), E Paraguay (E from near R Paraguay) and NE Argentina (E Formosa, E Chaco, Corrientes).



Descriptive notes. 17-20·5 cm; 40-50 g. Male nominate race has black crown, lores, auriculars and subocular area; upperparts mostly whitish-grey, heavily tinged pearly grey; wings mostly black, tertials greyish-white; primary P9 greatly reduced in length, outermost primary normal; tail entirely black; throat and underparts white; iris dark; upper mandible bluish-grey, lower mandible blackish; legs blackish. Female has buffy forehead, chestnut or rusty side of head, black cap, duller and slightly darker grey back with dusky brownish streaking and coarsely spotted blackish, dingy pale greyish-buff wash on throat and breast. Juvenile (*fraserii*) closely resembles female, but has black and cinnamon or chestnut mottling on crown, white nape with buff and dusky mottling, whitish and grey mottling on upperparts, buff-tinged wing-coverts and tertials mottled dusky, underparts tinged with buff; immature plumage attained quickly, like female, but young male has white forehead, pale grey upperparts, crown sometimes mottled; adult plumage also acquired quickly. Races vary considerably in plumage, also generally larger in S: *fraserii* has white nape and cheek, shading into pale greyish-white on under-

On following page: 411. Black-tailed Tityra (*Tityra cayana*).

parts, darker back, inner webs of primaries white basally (conspicuous patch in flight), female has more brownish (not grey) back and scapulars; *albitorques* is slightly smaller, also has white cheeks (and auriculars), has pale grey back, greyish underparts, and tail mostly white (black reduced to subterminal band c. 20 mm wide usually bordered terminally by white apical margins), female has pure white lower belly and crissum and unspotted brownish-washed back (variable); *erythrogenys* is generally similar to nominate, but smaller, with less white on hindneck, only extreme base of tail white with no white apical margin, female has grey back without brownish suffusion and more or less spotted with black (significant individual variation) and white throat or chest with slight greyish tinge; *buckleyi* has white cheeks and auriculars, predominantly black tail with white only at very extreme base of rectrices (except for an Ecuador specimen which has small but prominent white apical spots on three outer rectrices and more white at base of outer web of penultimate rectrix); *pelzelni* has head pattern like nominate (some specimens from lower Amazon have white streaks on auriculars), tail mostly white (especially birds from lower Amazon) but considerable individual variation in extent of white at base of rectrices and white apical margin (least in Bolivia and Mato Grosso). VOICE. Usually rather quiet. Typical calls a husky grunting or dry guttural, somewhat strident, frog-like and variable "sheh-shehk", "squik" or "zick-zick-zick", and a series of low, weak, and nasal "chet-chut, chaa-cherp" notes, often given as two notes in a series; call also described as an odd-sounding nasal grunting with buzzy quality, "uurnt" or "uurnt-uurnt"; on addition, gives strange thin "corre corre" call.

Habitat. Humid to semi-humid tall forest canopy and mature second growth along borders, clearings with scattered tall trees near continuous forest, river edges, and plantations; also *várzea*. Mostly below 1200 m.

Food and Feeding. Largely frugivorous, but also captures much invertebrate prey, primarily to feed offspring. Observed singly, in pairs, or in small groups. Fairly antisocial, sometimes aggressive towards other birds, and almost never associates with mixed flocks. Generally perches conspicuously on a bare branch at middle to upper levels, but regularly lower, and sometimes for long periods. Scans foliage intently, looking for large insects and caterpillars, which it takes by quick upward strikes to vegetation; occasionally perch-gleans or hover-gleans insects and relatively large fruits.

Breeding. Nestlings in Mar-Jun in Costa Rica; males in breeding condition in May (S César) and Jul (Norte de Santander) in Colombia; breeding behaviour in May-Aug in Venezuela (SW Guárico); nest in Dec in Brazil (Rio Grande do Sul); nest in Oct and one being built in Nov in Argentina. Nest in old woodpecker (Picidae) hole or similar cavity at middle to upper level (generally c. 12-30 m) in tree, cavity usually partially filled and lined with dead leaves, small twigs and various other plant matter (e.g. flower stalks); sometimes in same tree as *T. semifasciata*. Clutch size uncertain, probably 3 eggs; incubation by female, period thought to be c. 18-21 days; chicks fed by both sexes, nestling period c. 20-30 days.

Movements. No significant movements known.

Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Apparently more abundant in S part of range. Has a large range, within which much of its habitat remains relatively undisturbed. Occurs in numerous national parks and other protected areas.

Bibliography. Accordi *et al.* (2000), Anon. (1998a), Binford (1989), Boesman (1998), Brooks *et al.* (1993), Canevari *et al.* (1991), Clements and Shany (2001), Cory and Hellmayr (1927), Cracraft (1985), Darrieu & Camperi (1991), Di Giacomo (2004), Du Bus (1847), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Henderson (2002), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Hutto (1992), Kaup (1852), Kiff & Hough (1985), Lanyon (1985), Lee Jones (2004), Lowen *et al.* (1996), McKitrick (1985), Meyer de Schauensee (1966, 1982), Monroe (1968), de la Peña (1987, 1989), Prum *et al.* (2000), Ridgely (1981), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson (1997), do Rosário (1996), Short (1975), Sibley & Ahlquist (1985c), Sick (1993, 1997), Skutch (1969), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Terborgh *et al.* (1984), Thomas (1979a), Tostain *et al.* (1992), Traylor (1977), Wetmore (1972), Willis (1980), Zimmer (1936b).

411. Black-tailed Tityra

Tityra cayana

French: Tityre gris **German**: Schwarznackentityra **Spanish**: Titira Colinegro

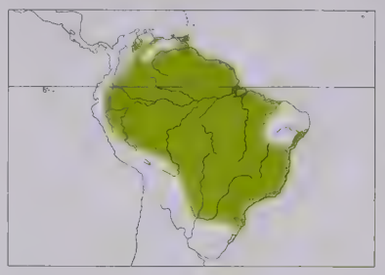
Taxonomy. [*Lanius*] *cayanus*, Linnaeus 1766, French Guiana.

Genus formerly included with *Pachyramphus* in the Cotingidae, but transferred to the present family on the grounds of several shared, derived similarities of the skull and syrinx. Because of their similarity to cotingids in respect of many other features, some authors prefer to treat both genera as representing a separate family (Tityridae) or to leave them in Cotingidae. Phylogenetic affinity of genus and of this species currently unknown; molecular investigation needed. Races differ considerably in plumage; has been suggested that they be treated as two separate species, but apparent intergrades occur in a belt from NE Brazil (Piauí) SW through Mato Grosso to Bolivia. Two subspecies recognized.

Subspecies and Distribution.

T. c. cayana (Linnaeus, 1766) - Venezuela, Trinidad, the Guianas, E Colombia, N Brazil (Amazon and tributaries E to Pará and Amapá), E Ecuador, E Peru and Bolivia.

T. c. braziliensis (Swainson, 1837) - NE, C & S Brazil (Maranhão, Piauí and Pernambuco S to Mato Grosso do Sul and N Rio Grande do Sul), N and E Bolivia (La Paz, Cochabamba, Santa Cruz), N, C & E Paraguay (primarily E of R Paraguay) and NE Argentina (S to E Formosa, E Chaco and Misiones, probably also Corrientes).



Descriptive notes. 20-22 cm; 69 g. Male nominate race has crown and side of head to below eye black, bare rosy-red facial skin around eye and on lores; upperparts pale silvery white or pearly grey; wings mostly black, tertials silvery grey; primary P9 greatly reduced in length, outermost primary normal; tail relatively short, entirely black; throat and underparts white, tinged with grey; iris dark; bill quite sturdy, slightly hooked, rosy red on basal half, black terminally; legs blackish. Distinguished from *T. semifasciata*, mainly by black on head extending over crown, no white in tail. Female has more dusky brownish crown, mostly dingy brownish-grey upperparts with coarse dark streaks, especially on nape and back, narrow but prominent dusky streaking on whitish breast. Juvenile undescribed. Race *braziliensis* is distinctive: male generally more white than nominate, facial skin reddish-purple, bill mostly black with just base reddish-purple; female lacks black cap, has head and upperparts more greyish-brown, coarse black streaking on head and back, underparts more buffy-tinged and much more densely streaked with black. VOICE. Generally not very vocal. Typical call a soft, buzzy and nasal grunting or croaking "ed", "urt", "wenk" or "rek", usually as double notes or in triplets, "weenk, weenk, weenk"; often calls in flight.

Habitat. Borders of humid lowland (*terra firme* and *várzea*) and foothill forest, tall and relatively open second growth along rivers, gallery forest, tall snags, plantations, and clearings with scattered trees. Mostly to c. 500 m, occasionally higher, to 1100 m.

Food and Feeding. Mostly frugivorous; also takes a fair amount of insects, mostly for feeding to offspring. In pairs or in small, loosely connected groups, and sometimes singly; aggressive towards other birds, and rarely social. Usually perches high on a bare limb, often in the open. Food taken by perch-gleaning or hover-gleaning. A main seed-disperser of *Cabralea canjerana* (Meliaceae) in SE Brazil.

Breeding. Nests in Mar (Meta), Jul and Nov (Leticia) and birds in breeding condition in Jun (Caquetá) in Colombia; nests in Feb, Mar and Nov in Trinidad, Mar in Ecuador, Oct and Nov in Argentina and Dec in Brazil. Nest in natural tree cavity, broken stub or old woodpecker (Picidae) hole at middle to upper level, one in Ecuador c. 9 m up in a *Cecropis* tree adjacent to oxbow lake; cavity usually lined or filled with dead leaves, small twigs and sometimes various other plant material. Clutch size uncertain, probably 3 eggs; incubation by female, period probably c. 18-21 days; chicks fed by both parents, nestling period probably c. 20-30 days. Parasitism by Shiny Cowbird (*Molothrus bonariensis*) recorded.

Movements. None known.

Status and Conservation. Not globally threatened. Fairly common to common. Has a large range, within which extensive areas of suitable habitat are still in relatively pristine condition. Occurs in many national parks and other protected areas.

Bibliography. Anon. (1998a), Bates & Parker (1998), Brooks *et al.* (1993), Canevari *et al.* (1991), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cory & Hellmayr (1927), Darrieu & Camperi (1991), Di Giacomo (2004), Dubs (1992), Ffrench (1991), Fontana *et al.* (2000), Friedmann (1948), Friedmann & Smith (1955), Guix (1995), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Herklots (1961), Hill & Greeney (2000), Hilty (2003), Hilty & Brown (1986), Irestedt *et al.* (2001), Johansson (2002), Lanyon (1985), Lowen *et al.* (1996), McKitrick (1985), Meyer de Schauensee (1966, 1982), Miserendino (1998), Narosky & Yzurieta (1993), Novaes (1978a, 1992), de la Peña (1989), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Ridgway (1907), Robinson (1997), do Rosário (1996), Schulenberg *et al.* (2001), Short (1975), Sibley & Ahlquist (1985c), Sick (1993, 1997), Snyder (1966), Stiles & Skutch (1989), Stotz *et al.* (1996), Temple (2002), Terborgh *et al.* (1984), Tostain *et al.* (1992), Traylor (1977).

PLATE 48 ➤


412
ssp viridis
413
ssp griseigularis
414
PLATE 48
inches 2
cm 5
415
416
ssp rufus
ssp saturatus
417
ssp juruanus
418
ssp parui
ssp castaneus
ssp spixii
ssp tenebrosus
ssp fulvidior
ssp dorsalis
ssp polychopterus
420
419
ssp cinnamomeus

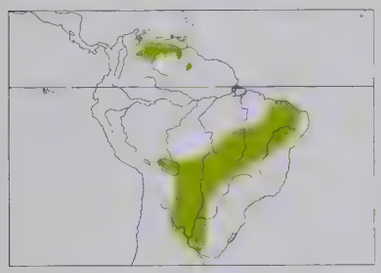
Genus *XENOPSARIS* Ridgway, 1891

412. White-naped Xenopsaris

Xenopsaris albinucha

French: Bécarde à nuque blanche **German**: Kappenbekarde **Spanish**: Anambé Chico
Other common names: Reed Becard, Xenopsaris

Taxonomy. *Pachyramphus albinucha* Burmeister, 1869, near Bueno Aires, Argentina.
Affinities uncertain. Early taxonomists hypothesized that genus was close to *Knipolegus*, *Serpophaga* and *Suiriri*, whereas later ones included it within the family Cotingidae and placed it close to *Pachyramphus*. More recent systematic studies indicate that, on basis of cladistic analysis of morphology, this species may be the closest living relative of latter genus (but still with somewhat uncertain affinity); has been suggested that the two genera should be merged, but in most treatments monotypic genus is retained for present species because of its significant differences (including much smaller size, different tarsal scutellation, short pointed primary P9, absence of strong sexual dimorphism, nest type). Has also been proposed that both genera and several others (*Laniocera*, *Laniisoma* and *Iodopleura*) comprise a natural group, known as the "*Schiffornis* assemblage". Two subspecies recognized.
Subspecies and Distribution.
X. a. minor Hellmayr, 1920 - W & C Venezuela (extreme W Falcón, NE Lara and W Apure E to Anzoátegui and N Bolívar); probably also in parts of NE Colombia (Arauca and Vichada).
X. a. albinucha (Burmeister, 1869) - Guyana, N, NE & E Brazil (Roraima; Maranhão, Piauí, Ceará, Pernambuco and W Alagoas S through interior, including W Bahia, to Mato Grosso and Mato Grosso do Sul), N & E Bolivia (Beni, Santa Cruz), W & C Paraguay (Chaco), NE Argentina (E from Tucumán and Córdoba, S to Santa Fe, Entre Ríos and Buenos Aires) and extreme NW & W Uruguay.



Descriptive notes. 12·5-13 cm; 10·2 g. Male has crown glossy black with bluish sheen; lores and lower forehead markedly white, side of head and neck basically white but face more dirty-looking (greyish-tinged auriculars), light-coloured eyering; nape pale grey, sometimes greyish-white to white band separating crown and upper back (usually difficult to see in field); upperparts mostly greyish-brown, rump and scapulars more greyish (but still obvious brownish tinge); wings more dusky brown than grey, narrow whitish edging on inner remiges and wing-coverts; primary P9 shorter and pointed; tail dusky brownish, pale lateral edges on two outermost rectrices, pale brownish tips; mostly pure white with creamy tinge below, except for faint greyish tinge on chest and slightly more yellowish belly; iris dark brown or seal; bill stout, upper mandible black, lower mandible more plumbeous; legs black. Differs from somewhat similar *Pachyramphus rufus* mainly in smaller size, longer tail, thinner bill, white margins on inner remiges, whiter (not grey) underparts, and more brownish tinge above. Female resembles male but may be slightly duller overall, and crown with brownish-chestnut tinge. Immature has stronger brownish tinge on crown, greyish nape, slight brownish tinge on upperparts (sometimes scalloped appearance), creamy yellowish belly. Race *minor* is more or less identical in plumage to nominate, but significantly smaller: male wing 60-62 mm and tail 53-57 mm (respectively, 64-66 mm and 58-61 mm in nominate). Voice. Typical song, heard most often during rainy season (but at all hours of day), rather delicate, given at long intervals, does not carry very far, described as high-pitched, thin and hesitant "teep, tre'e'e'e'e'a eea wu'u'u'e'e'e-e-e-e-e-p" or "twip, tsiweeé, tseee, ti-ti-ti-ti", with initial trill rising and then falling and last trill long, quavering and ascending; sometimes pattern varied and/or only part of song given; also described as squeaky and slightly undulating screech.
Habitat. Locally in *caatinga*, brushy riparian areas, light woodland and borders, isolated groves of trees around ranch buildings, also borders of dry gallery forest and sedges along riverbanks, tall herbaceous vegetation, and largely open areas with scattered trees; usually near water or in damp areas. To 550 m.
Food and Feeding. Insects recorded in diet. Singly or in pairs, partners typically remaining well apart. Generally rather quiet and inconspicuous, usually perched in erect, upright posture in outer foliage of trees. Typically, sallies short distances of c. 0·5-1·5 m; hover-gleans insects from tops of leaves or sally-strikes insects from leaves without pausing; sometimes makes acrobatic chases after prey that is attempting to escape. Often forages at lower levels, and regularly takes prey from the ground.
Breeding. Jun-Sept in Venezuela, with active nest in Jul and incubation in late Aug in W Venezuela; Oct-Jan in Argentina. Nest cup-shaped, c. 4·5 cm across, 4 cm tall and 1·8 cm deep, walls c. 0·5 cm thick, composed primarily of woven plant fibres and some rootlets, placed c. 5-15 m above ground (but likely also lower) in fork of tree (with very minor to no significant attachment) in tree c. 15-20 m tall. Clutch 3 eggs. No further information.
Movements. Resident. Possibly some movement in S of range, e.g. Bolivia.
Status and Conservation. Not globally threatened. Rare to uncommon, and local. Perhaps most common in pantanal of W Mato Grosso do Sul, but even there not regular. Has been recorded in Beni Biosphere Reserve and Madidi National Park, in Bolivia, San Luis and Ybycuí National Parks, in Paraguay, and Maracá Ecological Station (Roraima) and Serra da Canastra National Park, in Brazil.
Bibliography. Babarskas *et al.* (2003), Berlepsch & Hartert (1902), Canevari *et al.* (1991), Capper *et al.* (2001), Carriker (1910), Chebez (1994), Chesser (1997), Cory & Hellmayr (1927), Cracraft (1985), Cruz & Andrews (1989), Di Giacomo (2004), Di Giacomo & Leiberman (2000), Ericson & Amarilla (1997), Fjeldså & Maijer (1996), Friedmann & Smith (1950), Hayes (1995), Herzog *et al.* (1997), Hilty (1999, 2003), Lanyon (1988b), Narosky & Di Giacomo (1993), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1980, 1987, 1988, 1996, 1997), Prum & Lanyon (1989), Ridgely & Tudor (1994), Short (1975), Sick (1993, 1997), da Silva & Oren (1990), Smith (1971), Snow, D.W. (1973b), Stotz *et al.* (1996), Teixeira *et al.* (1989), Traylor (1977), Zyskowski *et al.* (2003).

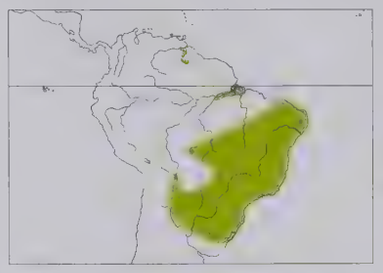
Genus *PACHYRAMPHUS* G. R. Gray, 1840

413. Green-backed Becard

Pachyramphus viridis

French: Bécarde verte **German**: Grünrückenbekarde **Spanish**: Anambé Verdoso

Taxonomy. *Tityra viridis* Vieillot, 1816, Paraguay.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Previously considered conspecific with *P. xanthogenys*, but differs in plumage and habits and is widely separated geographically. Two subspecies recognized.
Subspecies and Distribution.
P. v. griseigularis Salvin & Godman, 1883 - SE Venezuela (E Bolívar), Guyana (Mt Roraima) and locally in N Brazil (lower R Tapajós and E on both banks of Amazon to Marajó I).
P. v. viridis (Vieillot, 1816) - NE, WC & S Brazil (from Ceará, Rio Grande do Norte and S Piauí S to Tocantins, S Mato Grosso and Rio Grando do Sul), E & S Bolivia (NE Santa Cruz S to E Chuquisaca and Tarija), Paraguay, N Argentina (S to Tucumán, Santa Fe and Entre Ríos) and N & E Uruguay.



Descriptive notes. 14·5-15 cm; 21 g. Male nominate race has glossy black crown, whitish lores, face and throat, narrow yellowish eyering; side of head, and neck and nuchal collar pale grey; upperparts largely rather bright olive; flight-feathers and tail dusky olive, remiges with olive edges; broad pectoral band bright yellow to greenish or olive-yellow merging into rest of underparts greyish-white with buffy tinge; iris dark; bill rather broad, slightly hooked, pale bluish-horn; legs dark or greyish. Differs from *P. xanthogenys* in grey face and throat, brighter pectoral band. Female is similar in pattern to male, but has greyish lores with dusky tinge, greyer face, crown dull olive, upperparts pale olive, largely rufous-chestnut lesser wing-coverts, usually somewhat more dusky below, with pectoral band sometimes more obscure. Race *griseigularis* differs from nominate in lacking pale nuchal collar, male having less distinctive pectoral band, female almost no pectoral band. Voice. Typical song a series of melodic whistles, "trididideédeédeédeé", often with cresendo, or a sequence of c. 6 "ew-léé" notes; typical call a fast, thin and nasal "q-wink, q-wink" that rises in pitch, may be repeated up to twelve times; also a "jew" call note.
Habitat. Tall moist to humid forest, lighter woodland, gallery forest, edges, shrubby borders, and clearings or broken forest areas with scattered trees. To 1000 m.
Food and Feeding. Insects. Observed singly or in pairs, partners often remaining well apart; often mingles in mixed-species foraging flocks. Forages at varying heights in more open parts of trees, hopping casually and often pausing to peer intently, before reaching from perch or sallying a short distance to snatch or hover-glean insects from foliage.
Breeding. Oct-Dec in Argentina. Nest rather untidy, bulky and globular, c. 25 cm high, 18-24 cm wide, entrance hole on side or near bottom, hole diameter 3·5-5 cm, inner chamber c. 8·5 cm across, composed of dead leaves, fibres, moss, etc.; generally hanging from drooping branch or wedged in fork among outer branches at middle to upper level of tree. Clutch 2-4 eggs; incubation by female, period thought to be c. 18-21 days; chicks fed by both sexes, nestling period c. 20-30 days.
Movements. None known.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Occurs in Noel Kempff Mercado National Park, in Bolivia, Caaguazú, San Rafael and San Luis National Parks, all in Paraguay, Iguaçu and Itatiaia National Parks, in Brazil, Cerro Corá National Park, in Uruguay, and Calilegua National Park, in Argentina.
Bibliography. Babarskas, Haene & Pereira (2003), Babarskas, Veiga & Filiberto (1995), Brooks *et al.* (1993), Canevari *et al.* (1991), Cracraft (1985), Di Giacomo (2004), Dubs (1992), Hayes (1995), Hellmayr (1929), Hennessey & Gómez (2003), Hilty (2003), Lanyon (1985), López (1997), Lowen *et al.* (1996), McKitrick (1985), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Nores *et al.* (2000), de la Peña (1987, 1989, 1997), Prum *et al.* (2000), Ridgely & Tudor (1994), do Rosário (1996), Saibene *et al.* (1996), Short (1975), Sick (1993, 1997), Silveira *et al.* (2003), Stotz *et al.* (1996), Wetmore (1926), Willis & Oniki (1990).

414. Yellow-cheeked Becard

Pachyramphus xanthogenys

French: Bécarde à joues jaunes **German**: Gelbwangenbekarde **Spanish**: Anambé Cariamarillo

Taxonomy. *Pachyrhamphus xanthogenys* Salvadori and Festa, 1898, River Zamora, Ecuador.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Previously considered conspecific with *P. viridis*, but differs in plumage and habits and is widely separated geographically. Validity of race *peruanus* uncertain. Two subspecies recognized.
Subspecies and Distribution.
P. x. xanthogenys Salvadori & Festa, 1898 - E Ecuador (E slope of Andes from W Sucumbíos S to Zamora-Chinchipe) and N Peru (Cajamarca, Amazonas); probably also extreme S Colombia.
P. x. peruanus Hartert & Goodson, 1917 - C & SE Peru (Huánuco, Pasco, Junín, Madre de Dios).
Descriptive notes. 14·5 cm. Male has glossy black crown, bright olive nape; white lores, partial yellow eyering; face mostly bright yellow to greenish-yellow, becoming yellowish-olive on side of throat; upperparts bright olive; wings blackish, broad pale olive edging on wing-coverts and

On following pages: 415. Barred Becard (*Pachyramphus versicolor*); 416. Slaty Becard (*Pachyramphus spodiurus*); 417. Cinereous Becard (*Pachyramphus rufus*); 418. Chestnut-crowned Becard (*Pachyramphus castaneus*); 419. Cinnamon Becard (*Pachyramphus cinnamomeus*); 420. White-winged Becard (*Pachyramphus polychopterus*).



inner remiges; tail dusky olive; neck side, throat and chest bright yellow, becoming more yellowish-olive on breast and whitish on belly; iris dark; bill rather broad, slightly hooked, pale bluish-horn; legs dusky or greyish. Female is similar in pattern to male, but has forecrown blackish and remainder of crown and nape more grey or greyish-olive, lores greyish-olive, face pale greyish (sometimes some yellowish on cheek), lesser wing-coverts rufous-chestnut, throat greyish, pectoral band greenish and lower breast more pale olive, and belly white with some greyish wash along sides and flanks. Race *peruanus* is slightly brighter on face and breast. Voice. Typical male song, usually conducted from well-concealed high perch, a distinctive series 2-3 seconds long of soft and subdued musical whistles, "du-du-dididididi" or "du-de-de-de-dididididi", often given at long intervals and preceded by one or more upslurred "te-wik" notes.

Habitat. Borders of humid montane and foothill forest, woodland edges, and clearings with scattered tall trees; considered a non-forest species, only rarely observed deep within continuous forest. Primarily at 650-1700 m, perhaps occasionally lower.

Food and Feeding. Usually observed in pairs; does not usually mingle with mixed species flocks. Generally rather sluggish and inconspicuous. Forages at varying heights in trees with dense foliage, but usually at higher levels and always well above the ground.

Breeding. Nest bulky and globular, entrance hole on side or near bottom, composed of dead leaves, fibres, moss, and so on; generally hanging from drooping branch or wedged in fork among outer branches at middle to upper levels of tree. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to fairly common; probably often overlooked. In Ecuador, common along road to Loreto N of Archidona and in the Zumba area, and occurs also in Podocarpus National Park. In Peru, recorded recently at c. 600 m near Tamborapa, in Cajamarca, well N of known range of race *peruanus*; possible that nominate race, from farther N, was involved; also, recently recorded (and photographed) at 900 m above Hacienda Amazonia, near Manu National Park and Biosphere Reserve.

Bibliography. Begazo *et al.* (2001), Clements & Shany (2001), Hellmayr (1929), Lanyon (1985), McKitrick (1985), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Williams & Tobias (1994).

415. Barred Becard

Pachyramphus versicolor

French: Bécarde barrée **German**: Wellenbekarde **Spanish**: Anambé Barrado

Taxonomy. *Vireo versicolor* Hartlaub, 1843, "Bogotá", Colombia.

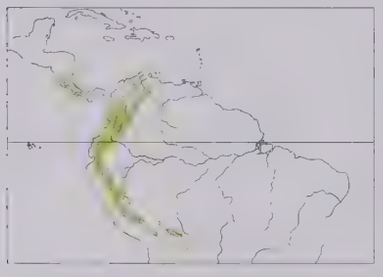
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Variation among races negligible; has been suggested that *meridionalis* should perhaps be merged with nominate. Three subspecies currently recognized.

Subspecies and Distribution.

P. v. costaricensis Bangs, 1908 - Costa Rica and W Panama (Chiriquí).

P. v. versicolor (Hartlaub, 1843) - Sierra de Perijá, and Andes from SW Venezuela (S from SE Lara) and Colombia (S of Valle in W Andes, S from Norte de Santander in C range, and from SE Santander and NE Boyacá S on both slopes of E cordillera) S to C & SE Ecuador (S on W slope to Chimborazo and on E slope to Zamora-Chinchipe).

P. v. meridionalis Carriker, 1934 - SE Ecuador (Zamora-Chinchipe), Peru (N Amazonas S to N Puno, including extension on Pacific slope in SW Cajamarca) and NW Bolivia (La Paz, Cochabamba).



Descriptive notes. 11·5-13 cm; 14-17 g. Male nominate race has crown, nape and back mostly glossy black, sometimes more olivaceous, rump and uppertail-coverts slate-grey; lores yellow, face and neck side greenish-yellow with fine light dusky barring; wings more or less black and white, scapulars and lesser and median wing-coverts largely white with prominent black edging, greater coverts and inner remiges black with white margins; tail dusky slate, white edges at tips of lateral rectrices; throat greenish-yellow, fading to whitish below, underparts with some light dusky barring (except on centre of belly); iris dark; bill rather stout, upper mandible black, lower mandible bluish-grey; legs grey. Female is mostly olive to olive-green above, crown more slate-grey, face olive with yellow eyerings, wings blackish but with quite prominent and mostly rufous-chestnut wing-coverts, buff margins on tertials and rufous edgings on most secondaries; pale yellow to greenish-yellow below, with dull narrow dusky barring on throat, breast and sides. Immature male is much duller, more greenish overall, with yellowish eyerings like female; dull olive-green mixed with sooty black above, except for dark sooty-grey crown and hindneck; scapulars and wings more greenish-yellow, underparts mostly dull greenish-yellow with faint dusky barring except on belly. Races exhibit rather slight degree of variation in coloration of upperparts: *costaricensis* has distinctly more yellowish-olive back and rump, but variable, and some have black back like nominate; *meridionalis* is said to be less barred below. Voice. Typical call a soft, high-pitched "weet weet weet", given incessantly, a soft "tu-duu" whistle, or more excited "tseep tseep tseep tseep"; also high-pitched but weak trill and various twittering notes; male song a soft melodic "pee-pee-pee-pee-pipipipeh", "we-pe-pi-pi-pi-pi" or "we-pi-pi-ti`ti`tre`tre`ree", rising and then falling at end, generally given at long intervals, and sometimes changing to faster and rising "trrrdididee" or "tree, tree-dee-dee-dee-dee" with pause of up to 10 seconds after first note.

Habitat. Canopy or borders of humid and wet montane forest, and edges of lighter mature secondary woodland or semi-open areas at lower elevations. Mostly 1500-2900 m, but recorded as low as 400 m, and as high as 3050 m in Ecuador (Cerro Toledo) and even 4000 m in Colombia (Magdalena Valley).

Food and Feeding. Arthropods, also small fruits such as *Trema* and *Urera*. Singly, in pairs, or in small family groups following breeding season; regularly accompanies mixed-species foraging flocks. Perches fairly upright, at lower to upper levels, usually 1-5 m, rarely higher where vegetation is dense. Actively sally-gleans insects from vegetation, regularly striking against foliage or hovering briefly; also hops along branches and perches on leaves and epiphytes; also hover-gleans items.

Breeding. Apr-Jun in Costa Rica; birds collected in breeding condition in Jun (Antioquia) and nestlings in May and Oct (W Andes above Cali) in Colombia; in Ecuador, fledging occurs in May in NW, and juveniles recorded in Dec in NE. Nest is bulky and more or less globular, c. 30 cm in diameter, with entrance hole near bottom, composed primarily of moss and vines and lined with leaves, generally saddled or wedged in fork of slender branches towards outside and upper level of tree at 2-15 m, occasionally as high as 23 m, and often outside continuous forest. Clutch 2-3 eggs; incubation by female, probably c. 18-21 days; chicks fed by both parents, nestling period c. 20-30 days.

Movements. Resident.

Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Occurs in Rancho Naturalista and Tapantí National Park, in Costa Rica, Sierra Nevada National Park, in Venezuela, almost all national parks in Ecuadorian Andes, Machu Picchu Historical Sanctuary, in Peru, and Madidi National Park, in Bolivia.

Bibliography. Anon. (1998a), Baez *et al.* (1997), Blake (1958), Butler (1979), Chapman (1921), Clements & Shany (2001), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Krabbe *et al.* (1997), Lanyon (1985), McKitrick (1985), Meyer de Schauensee (1982), Miller (1963), Prum *et al.* (2000), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Salaman (1994), Sibley & Ahlquist (1985c), Skutch (1967), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Walker (2001), Wetmore (1972), Williams & Tobias (1994).

416. Slaty Becard

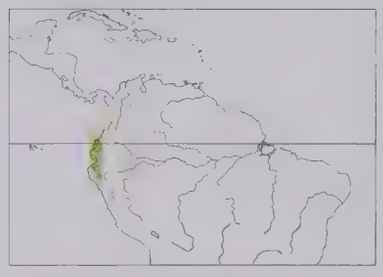
Pachyramphus spodiurus

French: Bécarde ardoisée **German**: Schieferbekarde **Spanish**: Anambé Pizarra

Taxonomy. *Pachyramphus spodiurus* P. L. Sclater, 1860, Babahoyo, Los Ríos, Ecuador.

Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Has been suggested that it is closely related to, and perhaps conspecific with, *P. rufus*; the two appear to replace each other geographically and, arguably, constitute a zoogeographical species. Monotypic.

Distribution. W Ecuador (W Esmeraldas and Pichincha S to W Loja) and extreme NW Peru (Tumbes, Piura, Cajamarca).



Descriptive notes. 14 cm. Male is mostly slaty grey above, whitish supraloral spot, crown and nape black, nape with some slaty grey mixed in, sometimes some black on back; wings blackish, narrow white margins on remiges, black patch on primary coverts; tail dusky black, sometimes narrow pale greyish edging; grey below, throat slightly paler grey; iris dark; bill blackish, more pale greyish towards base of lower mandible; legs blackish. Distinguished from *P. homochrous* by smaller size, smaller bill, pale supraloral spot, white margins on wing feathers. Female is entirely bright cinnamon-rufous above, darker on crown, small whitish-grey supraloral spot, lighter buff-cinnamon face; most remiges blackish with distinctive rufescent margins (folded wing appears largely cinnamon-rufous), tail cinnamon; mostly whitish cinnamon-buff below, distinctly more buffy tinge across chest and upper breast, throat more whitish with buffy tinge on sides. Voice. Typical male song is a short, fast series of rather musical notes, "tu, tu, tee tee-tititititi", that starts slowly, rapidly accelerates and increases in pitch and volume; also gives a short (2-3 seconds) slurred trill that starts low before taking on more even pitch.

Habitat. Semi-humid and deciduous woodland, scrubby areas, clearings and plantations with some tall scattered trees, and dry washes in arid scrub; also locally in more humid areas that have been deforested. Mostly below 600-750 m, locally to 1100 m.

Food and Feeding. Largely unknown. Most often observed in pairs. Perches in canopy or subcanopy; regularly forages close to the ground.

Breeding. No information. Thought to breed in Jan-Mar.

Movements. Resident.

Status and Conservation. ENDANGERED. Restricted-range species: present in Tumbesian Region EBA and Marañón Valley EBA. Rare to locally uncommon, and very local; probably often overlooked. Forest habitats within the Tumbesian region are being rapidly destroyed, degraded and fragmented as a result of timber extraction and livestock grazing. In W Ecuador below 900 m, deforestation rates of 57% per decade from 1958 to 1988, and predicted that virtually all lowland forest outside protected areas will soon have disappeared. Even protected areas are affected by logging, livestock grazing, illegal settling and habitat clearance by people with land rights. Marañón drainage has likewise lost most of its original forest cover through logging and agricultural expansion, and no protected areas exist. Consequently, the species' population of perhaps several thousand individuals has suffered a serious decline within its small range of 2060 km², and very few recent records exist, particularly in N of its Ecuadorian range. Historically known from 29 localities, but recent records only from Tumbes Reserved Zone (within the Northwest Peru Biosphere Reserve, in Peru), which is the only sufficiently large protected area for long-term survival, and from several sites in Ecuador, including the much smaller Cerro Blanco Forest Reserve, Loma Alta Ecological Reserve, Río Palenque Science Centre, and Manta Real (designated for protection), as well as several unprotected sites, e.g. near Pedro Vicente Maldonado (Pichincha), Arenillas (El Oro) and Puyango (Loja), some recent reports from relatively degraded areas, however, suggest that the species may also survive outside protected areas.

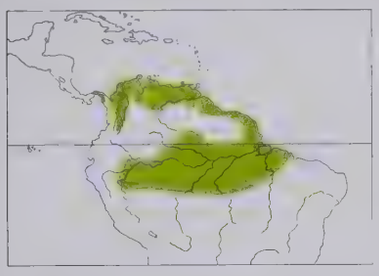
Bibliography. Berg (2002a), Best & Kessler (1995), Butler (1979), Clements & Shany (2001), Collar *et al.* (1992), Cracraft (1985), Lanyon (1985), McKitrick (1985), Meyer de Schauensee (1982), Pople *et al.* (1997), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996), Wege & Long (1995), Zimmer (1936b).

417. Cinereous Becard

Pachyramphus rufus

French: Bécarde cendrée **German**: Graubekarde **Spanish**: Anambé Cinéreo

Taxonomy. *Muscicapa rufa* Boddaert, 1783, Cayenne, French Guiana.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Has been suggested that it is closely related to, and perhaps conspecific with, *P. spodiurus*; the two appear to replace each other geographically and, arguably, constitute a zoogeographical species. Two subspecies recognized.
Subspecies and Distribution.
P. r. rufus (Boddaert, 1783) - W Panama (both slopes of Canal area, lower and middle Bayano Valley, and Darién), Colombia (Magdalena and Guajira S to Valle de Cauca and N Huila, also E of Andes in at least Norte de Santander and Leticia), W & N Venezuela (E, generally N of R Orinoco, to Sucre, Monagas and N & E Bolívar), the Guianas, and Brazil (middle and lower Amazonia from Manacapurú and Tefé E to Amapá, NE Pará and Maranhão).
P. r. juruanus Gyldenstolpe, 1951 - E Peru (Loreto) and W Amazonian Brazil (SW Amazonas).



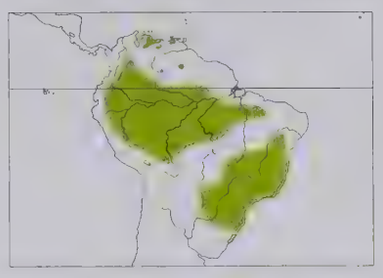
Descriptive notes. 12·9-14 cm; 18·5 g. Male has white lower forehead and loral area, dusky spot in front of eye, glossy black crown; upperparts mostly pearl-grey, sometimes with faint olive tinge, especially on upper back; wings blackish, narrow white margins on outer remiges, broader edging on inner remiges and wing-coverts; tail slaty grey, sometimes narrow whitish edging on tips of rectrices; throat whitish, underparts light greyish, darkest on chest and upper breast, sometimes with slight pale yellowish tinge; iris dark; bill blackish; legs greyish. Differs from similar *Xenopsaris albinucha* in less slender build, shorter tail, more greyish (less pure white) underparts, greyer (less brownish-tinged) upperparts and wings. Female is bright cinnamon-rufous above, crown often darker and more chestnut, lores whitish to whitish-grey, face light buffy cinnamon, wing feathers blackish with distinctive rufescent margins, greater coverts more uniformly cinnamon-rufous (folded wing appears largely cinnamon-rufous), tail cinnamon; whitish throat with cinnamon-buff tinge on sides, distinctly more buffy wash across chest and upper breast, more whitish on lower underparts. Races differ minimally: *juruanus* may have more extensive black on crown than nominate, extending farther on to nape, female with more extensive cinnamon-rufous below than nominate. Voice. Both sexes appear to have rather large repertoire of melancholy songs; typical song a fast series of musical notes, e.g. "twee, twee, twee-twee-twee-tweetweeteeteetititi", rising in pitch and accelerating to almost a trill towards end; also a sweet and strongly inflected "tuweé-tuweé-tuweé-tuweé-wee" whistle of more or less constant pitch; also gives thin, weak trill that rises sharply, but slows and descends towards end, also similar-sounding but shorter "twee-twee-twee-tweedo"; birds in Delta Amacuro (E Venezuela) said to give slightly hoarse "we'p-pe-pe-pe-pe-pe-pe-pé-wé-o" that runs up scale. Typical calls include high-pitched and metallic-sounding "eeeeé" that rises slightly at end, and buzzy "breez-det".
Habitat. Dry to moist areas, including light and open scrubby secondary woodland, clearings with groves of tall trees, lowland deciduous woodland, low scrub, cultivated areas and pastures with scattered trees, riparian woodland, mangroves, and forest borders; generally stays well away from continuous primary forest, and seems to prefer drier areas. To 1500 m.
Food and Feeding. Arthropods, including caterpillars; also small fruits and berries. Singly or in pairs; infrequently joins mixed-species foraging flocks. Perches in canopy and at lower levels; changes perch frequently, and actively peers about the vegetation. Typically perch-gleans or makes upward sally-gleans to take food items from foliage and branches.
Breeding. Nest found in Jun in Venezuela (Aragua); birds in breeding condition in Apr-Oct and Feb N Colombia. Nest bulky and globular, entrance hole on side, composed primarily of leaves and grass, generally wedged in fork among outer branches and usually at upper level of tree. Clutch 2-5 eggs; incubation by female, period c. 18-21 days, nestling period c. 20-30 days.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare to common. Apparently most abundant in the Guianas and least abundant in Panama. Range of race *juruanus* possibly extends N into extreme SE Ecuador; specimen records from Zamora-Chinchipe require confirmation of identification. Occurs in Darién National Park, in Panama, and Anavilhanas Ecological Station and Jaú and Tapajós National Parks, in Brazil.
Bibliography. Anon. (1998a), Bangs & Penard (1918), Boggs (1961), Butler (1979), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Delgado (1985), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon (1985), McKitrick (1985), Meyer de Schauensee (1982), Oniki & Willis (1982), Oren & Parker (1997), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Tostain (1980), Tostain *et al.* (1992), Zimmer (1936b).

418. Chestnut-crowned Becard

Pachyramphus castaneus

French: Bécarde à calotte rousse **German**: Graunackenbekarde **Spanish**: Anambé Castaño

Taxonomy. *Tityra castanea* Jardine and Selby, 1827, Rio de Janeiro, Brazil.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Possibly closest to to *P. cinnamomeus*; the two are sometimes treated as a single zoogeographical species, essentially replacing each other geographically, but slight morphological differences between them considered by most authorities sufficient for treatment as distinct species. Five subspecies recognized.
Subspecies and Distribution.
P. c. intermedius Berlepsch, 1879 - N Venezuela (Falcón and Lara E to Sucre).
P. c. parui Phelps, Sr & Phelps, Jr, 1949 - base of Cerro Parú, in Amazonas (S Venezuela).
P. c. saturatus Chapman, 1914 - SE Venezuela (SE Bolívar), E Colombia (R Dudita and Vaupés S to Meta), E Ecuador, NE & E Peru (Loreto, Cuzco), N Brazil (Amazonas, Acre and Rondônia E to Manacapurú and R Purús) and N Bolivia.
P. c. amazonus J. T. Zimmer, 1936 - N Brazil (both banks of Amazon from E Amazonas and Pará E to R Tocantins and Maranhão).
P. c. castaneus (Jardine & Selby, 1827) - NE , SE & S Brazil (N Bahia S to SE Goiás, Mato Grosso do Sul and N Rio Grande do Sul), SE Paraguay and NE Argentina (Misiones).



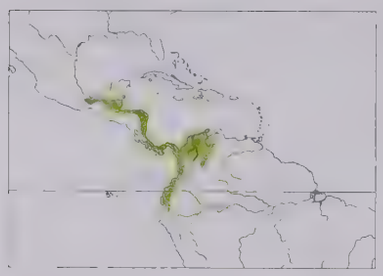
Descriptive notes. 14-14·8 cm; 17·3 g. Nominate race is largely cinnamon-rufous above, crown darker and more chestnut with somewhat scaly appearance (feathers having paler tips); lores more or less dusky; buff-whitish supraloral spot becomes grey above eye, extending as postocular stripe around nape; face pale cinnamon; wings mostly dusky cinnamon, remiges more dusky with pale cinnamon-rufous margins (wider on inside edge), wing-coverts more dusky rufous; tail cinnamon-rufous; mostly pale cinnamon-buff below, throat paler; iris dark; bill blackish; legs dusky. Distinguished from *P. cinnamomeus* by narrow grey band encircling nape. Sexes similar. Races differ only slightly: *saturatus* has darker and more chestnut upperparts, perhaps greyer and less scaled-looking crown; *amazonus* and *intermedius*; perhaps slightly paler above than nominate, especially on tail; *parui* is darker overall, has more dusky chestnut crown. Voice. Typical song a series of soft, thin, casual, rather musical whistles, e.g. "teeeuw-teeu-teeu" or "teeeer, tee, tee", 1-5 of each note in a series; also soft, lamenting, descending "deeeeu, deeu-dee-de-de" with variable number of end notes, usually given at infrequent intervals; also ascending tremolo "tewi, i, i, i, i, i, i" or sequence of high "bi-bi-bi-bi" notes; explosive "tic" said to occur sometimes during breeding season in interactions between mates, may be a mechanical sound produced by modified tips of outer rectrices.
Habitat. Borders of dry to humid lowland forest, including both *terra firme* and *várzea*, adjacent clearings with at least some scattered tall trees, light second-growth woodland, riparian forest, and coffee plantations. Primarily below 1000 m, locally to 1500-1700 m.
Food and Feeding. Large insects, including caterpillars; occasionally berries. Singly, more often in pairs; generally does not join mixed-species foraging flocks. Often remains high above the ground, tending to perch on fairly open inner branches; rather sluggish, and frequently nods the head. Perch-gleans or makes short sallies to snatch or hover-glean items from middle to upper levels.
Breeding. Birds in breeding condition and juveniles recorded in May in Colombia (Vaupés); nests found in Mar and Jul in Ecuador, and Oct and Feb in Argentina. Nest messy, bulky, and globular, entrance hole near bottom facing downwards, composed primarily of grass and various plant fibres, one nest (Argentina) 23-25 cm in diameter, entrance hole 3·5 cm, inner chamber 8 cm in diameter; generally wedged in fork among outer branches at middle to upper levels of emergent tree. No other specific information.
Movements. Resident.
Status and Conservation. Not globally threatened. Rare to locally common. Occurs in several seemingly disjunct populations; apparently rarer in Ecuador and Colombia than elsewhere, or perhaps often overlooked. Occurs in many national parks and other protected areas throughout its range, e.g. Henri Pittier National Park, in Venezuela, Tambopata-Candamo Reserved Zone and Manu National Park and Biosphere Reserve, in Peru, Pilón Lajas Biosphere Reserve and Madidi National Park, in Bolivia, San Rafael and San Luis National Parks, in Paraguay, and Iguaçu, Itatiaia, Jaú, Serra da Canastra, Tapajós and Tijuca National Parks, all in Brazil.
Bibliography. Allen (1995), Brooks *et al.* (1993), Butler (1979), Canevari *et al.* (1991), Chapman (1914), Clements & Shany (2001), Cracraft (1985), Greeney *et al.* (2004), Haffer (1974), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Lanyon (1985), Lowen *et al.* (1996), McKitrick (1985), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Oren & Parker (1997), Parker (1997), de la Peña (1987, 1989), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), do Rosário (1996), Saibene *et al.* (1996), Schulenberg *et al.* (2001), Sick (1993, 1997), Stotz *et al.* (1996), Zimmer (1936b).

419. Cinnamon Becard

Pachyramphus cinnamomeus

French: Bécarde cannelle **German**: Zimtbekarde **Spanish**: Anambé Canelo

Taxonomy. *Pachyramphus cinnamomeus* Lawrence, 1861, Lion Hill, Panama.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Possibly closest to to *P. castaneus*; the two are sometimes treated as a single zoogeographical species, essentially replacing each other geographically, but slight morphological differences between them considered by most authorities sufficient for treatment as distinct species. Variation among races, especially in NE Colombia and NW Venezuela, requires closer inspection. Four subspecies recognized.
Subspecies and Distribution.
P. c. fulvidior Griscom, 1932 - SE Mexico (SE Veracruz and NE Oaxaca E to N Tabasco and S Chiapas), N Guatemala, C & S Belize, N Honduras and N & E Nicaragua S to W Panama (W Chiriquí, W Bocas del Toro).
P. c. cinnamomeus Lawrence, 1861 - E Panama (Cerro Azul/Jefe, Bayano Valley, and Darién), NW & W Colombia (S to N Tolima and S Antioquia, E to upper Sinu Valley, and E of Andes from Cataatumbo S to W Meta) and W Ecuador (S to NW Azuay and El Oro).
P. c. magdalenae Chapman, 1914 - N Colombia (lower Magdalena Valley and N Sucre, and E from lower Sinu Valley) and W Venezuela (S Maracaibo Basin, NW Táchira, W Mérida).
P. c. badius Phelps, Sr & Phelps, Jr, 1955 - W Venezuela (E slope of Andes in S Táchira).
Descriptive notes. 14-15 cm; 17-22 g. Plumage is mostly uniform rufous or chestnut-rufous to rufous-tawny above, slightly darker on crown and with narrow pale buff supraloral, dusky lores; wings more or less rufous, darker and more dusky primary coverts; tail basically rufous; ochraceous tawny to cinnamon-buff or to tawny-buff below, slightly paler and more whitish on throat and belly, some rufous tinge across breast; iris dark; bill more or less blackish, often paler greyish to greyish-flesh lower mandible; legs dark grey. Differs from similar *P. castaneus* mainly in less contrasting crown, no grey nuchal collar. Sexes similar; adult male has shorter and attenuated primary P9, normal in female. Immature is similar to adult but paler overall, except for brighter rufous upperparts, also more pale buff belly; immature male has unmodified P9. Races differ



only slightly: *magdalenae* is said to be more whitish and washed with cinnamon below; *badius* similar to previous but slightly darker; *fulvidior* is more richly coloured than nominate. Voice. Typical song a somewhat plaintive, reedy, usually fast or nearly trilled series of musical notes, e.g. "teedeedee-deedeedee", "cheei dee-dee", "deeeuu dew dew, dew, dew", often beginning or ending with "tew" note that drops in pitch, with second part of series (5-9 notes) either rising or falling, and sometimes shorter and slower overall; female song generally shorter and weaker. Typical calls also reedy, but shorter "swee-dwee-dwee" or "seer eeer eeur" series; also variety of high-pitched, thin and more plaintive "seeeeiu" slurred whistle-like calls.

Habitat. Edges and sometimes canopy of humid and evergreen forests, secondary-woodland borders, clearings with scattered tall trees, open to semi-open light woodland, plantations, riparian areas, sometimes mangroves; often near water. Lowlands to 500-800 m, but recorded to 1200 m in E Panama (Cerro Tacarcuna), 1300 m in Colombia, and 1500 m in Ecuador (Chimborazo).

Food and Feeding. Insects, including beetles (Coleoptera), katydids (Tettigoniidae), homopterans, ants (Hymenoptera), caterpillars; also spiders; also copious amounts of berries. Singly or in pairs, occasionally in small loose groups; occasionally joins mixed-species foraging flocks. Perches at middle to upper levels, and occasionally lower in second growth bordering primary forest; often bobs its head. Actively sallies short distances to glean insects and other items from foliage or twigs; seems more sluggish when consuming fruit for an extended period.

Breeding. Mar-Jul in Costa Rica; nest-building observed in early Mar (Buenaventura) and Apr-May (NW Santander) and birds in breeding condition in Jan-Oct in N Colombia. Nest rather messy, bulky and more or less globular, entrance hole at side, sometimes tunnel entrance near bottom, composed of dead leaves (especially bamboo), long brownish fibres, green moss, rootlets and various other vegetable material (seed down, etc.); generally wedged in fork near end of branch and towards outer canopy c. 1·5-15 m above ground high; often placed close to an active wasp nest. Clutch 3-4 eggs; incubation by female, period c. 18-21 days; chicks fed by both parents, nestling period probably 20-30 days.

Movements. Populations of race *fulvidior* in Mexico may be at least partially migratory, with apparent movement out of N parts of range about Sept-Feb. Seems to be quite sedentary elsewhere.

Status and Conservation. Not globally threatened. Uncommon to common. Nominate race possibly extends slightly farther S in Ecuador; single record from Loja (also one farther W, at Guayaquil) unconfirmed. Given this species' tolerance of converted habitat and its relatively large range, it is not considered to be at any risk. Occurs in many national parks and other protected areas, including at least seven well-known reserves in Central America.

Bibliography. Anon. (1998a), Berg (1994), Binford (1989), Boggs (1961), Brodkorb (1943), Butler (1979), Chapman (1914), Dearborn (1907), González-García (1993), Griscom (1932), Haffer (1974, 1975), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Land (1970), Lanyon (1985), Lee Jones (2004), McKitrick (1985), Monroe (1968), Phelps & Phelps (1955), Prum *et al.* (2000), Pulgarín (2002), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Skutch (1969), Slud (1960, 1964), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), West (1976).

420. White-winged Becard

Pachyramphus polychopterus

French: Bécarde à ailes blanches **German**: Weißbindenbekarde **Spanish**: Anambé Aliblanco

Taxonomy. *Platyrhynchos polychopterus* Vieillot, 1818, Bahia, Brazil.

Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinities of present species remain unknown. Races exhibit rather marked variation in plumage and, in some cases, also in voice; it has been suggested that more than one species may be involved. Eight subspecies currently recognized.

Subpecies and Distribution.

P. p. similis Cherrie, 1891 - C Guatemala E to S Belize (Toledo) and N Honduras, S to N Colombia (N Chocó).

P. p. cinereiventris P. L. Sclater, 1862 - N Colombia (Chocó except extreme N, E to Santa Marta, S to upper R Sinú and César).

P. p. dorsalis P. L. Sclater, 1862 - C & SW Colombia (S Antioquia and Cundinamarca S to SW Nariño) and NW Ecuador (E Esmeraldas, N & W Imbabura, and N Pichincha S to Mindo area).

P. p. tristis (Kaup, 1852) - NE Colombia (E of Andes from Norte de Santander S to Boyacá, probably to Guainía), Venezuela (except Cerro Duida, in S Amazonas), Trinidad and Tobago, the Guianas and NE Brazil (Roraima E to Maranhão and SE Pará).

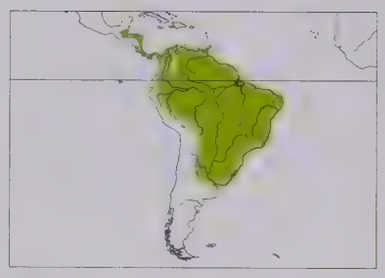
P. p. nigriventris P. L. Sclater, 1857 - E Colombia (E of Andes in W Meta S to Vaupés), S Venezuela (S Amazonas at base of Cerro Duida), W Brazil (both banks of upper Amazon E to R Jamundá and E bank of R Madeira), E Peru (S of R Marañón) and N Bolivia (Beni).

P. p. tenebrosus J. T. Zimmer, 1936 - SE Colombia (SE Nariño and W Caquetá E to Amazonas), E Ecuador and NE Peru (N & W Loreto and San Martín).

P. p. polychopterus (Vieillot, 1818) - E Brazil (Piauí and Ceará S to Alagoas and Bahia).

P. p. spixii (Swainson, 1838) - NW Bolivia (Pando and La Paz E to Santa Cruz and S to Tarija), S & SE Brazil (Mato Grosso E to Espírito Santo, S to Rio Grande do Sul), Paraguay, N Argentina (S to Tucumán, Córdoba and N Buenos Aires) and Uruguay.

Descriptive notes. 14-15·5 cm; 19·5-21 g. Male nominate race has crown, nape and upperparts glossy black to almost bluish, back more plain; head side, nuchal collar and rump and uppertail-



coverts paler, slate-grey; wings black, prominent white scapulars, broad white margins on wing-coverts (wingbars), secondaries and tertials; tail rather long, graduated, black, broad white tips on all but central rectrices; throat and most of underparts slate-grey, same colour as head side, belly paler; iris dark; bill blackish or silver-grey with black tip, often paler on lower mandible; legs dark grey or plumbeous. Distinguished from *P. marginatus* and *P. albogriseus* by the lack of white or grey on lores, more extensive white in wings, generally darker appearance overall. Female has brownish-olive or greenish-olive upperparts, more brown on crown, pale whitish supraloral stripe, broken pale eyering, wings with broad buff-cinnamon margins on scapulars, wing-coverts and inner remiges, blackish tail with broad buff-cinnamon tips (especially on outer rectices); pale yellowish below, olive tinge on breast and sides, more greyish throat; lacks shorter and attenuated primary P9 of male. Juvenile both sexes resembles female, but quickly acquires immature plumage; immature male resembles female, but may have more greyish throat, black specks on head and back, and blackish distal area on central rectrices. Races vary mainly in colour of underparts: *dorsalis* is palest, has clear pale grey underparts, neck side, nuchal collar and rump, more white on wings including wingbars and broad margins on scapulars and inner remiges, female has more olivaceous upperparts; *tenebrosus* is completely black, more sooty below (blackest in E Ecuador and adjacent areas), glossier above (especially crown), two bold white wingbars (upper bar broader than lower), and broad white tips on outer rectrices, female has more rufescent upperparts; *nigriventris* is all black above and below, white edging only on wing-coverts and tail tips, female is more greyish-olive (not light brown) above; *tristis* similar to previous, but underparts slaty grey, with some white freckling on centre of belly; *cinereiventris* similar to previous, but smaller, and more uniform grey below; *similis* like previous, but smaller, and paler grey below; *dorsalis* similar to *cinereiventris* but larger, and much paler below; *spixii* is mostly shiny black, lower underparts greyer, white wingbars, prominent pale edges on remiges (grey wing panel). Voice. Typical song of both sexes a variable series of 6-9 clear, rich, melancholy, and downslurred whistled notes, "chu chu chu wee" or "chu chuwee chuee", first note higher in pitch, last 2-3 slower, or with 3 slow notes followed by 3-4 shorter, faster, higher notes; also give soft, warbling, sweet-sounding and somewhat variable "teeur, tur-tur-tur-turtutur" song; also accelerated series of whistles that sometimes rises in pitch and becomes weaker; also a more rhythmic and fairly musical "tut-tut-tut-tut-tut-tut" of tittering quality; female has weaker version of typical male song. Voices of birds in NW & E Ecuador said to differ; in E (race *tenebrosus*) a fast but mellow and melodic series, "teu, teu, tu-tu-tu-tu-tu-tu", first notes delivered more slowly and number of "tu" notes varying, in NW (*dorsalis*) tending to have slower delivery which gives different effect, more as "teu, teu, teu, teu, ti-teu, teu" or "teeu, tew-te, teeu".

Habitat. Inhabits borders of humid to semi-arid light or secondary woodland and lowland forest, relatively open areas and clearings with scattered trees, shady plantations, old second growth, riparian and evergreen gallery forest, river islands, sometimes mangrove borders; also in *várzea* second growth. Primarily lowlands to 500 m, but often to 900-1900 m (e.g. around Volcán, in Panama, E slope of Andes, and NW Ecuador); to 2500 m, but rarely above 2000 m, throughout Colombia.

Food and Feeding. Caterpillars, large insects such as beetles (Coleoptera) or leafhoppers (Homoptera), and spiders; also consumes considerable amounts of small berries. Observed singly or in pairs; frequently associates loosely with mixed-species foraging flocks in middle to upper levels of wooded areas, but tends to forage alone where habitat more open or second growth. Typically, perches with rather upright posture. Peers intently, before sally-gleaning (occasionally hover-gleaning) fairly short distances to tree foliage at various heights, from lower middle levels at outer edges of trees to the subcanopy; sometimes comes closer to ground level. Seems to forage in rather lethargic manner most of the time.

Breeding. Apr-Aug in Costa Rica; in Colombia, birds in breeding condition in May-Aug in N and nest-building observed in Mar and mid-Jun in S; nests in Aug-Sept in W Venezuela, Mar-Sept in Trinidad, from Jan in Tobago; Nov-Feb in Argentina. Nest bulky, more or less globular, up to 30 cm high and 25 cm across, entrance hole on side, inner chamber 6-9 cm wide, composed primarily of grass, shredded fibres, thread-like inflorescences, Spanish moss (*Tillandsia*), feathers, dead leaves, various other fibres and moss, lined with grass, bamboo leaves and broad strips of monocot leaves; generally wedged in fork among slender outer branches, but fairly well hidden within foliage, c. 4-38 m above ground, usually high up in large isolated tree. Clutch 2-4 eggs; incubation by female, period c. 18-21 days; chicks fed by both parents, nestling period c. 21 days. Parasitism by Shiny Cowbird (*Molothrus bonariensis*) recorded.

Movements. Resident in much of range. Possibly partially migratory in extreme S. Possibly some local migratory movements, as suggested by two males killed by crashing into lighted windows at night at Rancho Grande Biological Station (Aragua), in Venezuela, in Apr.

Status and Conservation. Not globally threatened. Generally considered uncommon to common. Has the largest range of all becards, covering Central America and most of South America; possibly extends farther N, into S Mexico, where unconfirmed reports from E Chiapas. Tolerant of converted and secondary habitats, and occurs in many national parks and other protected areas throughout its range.

Bibliography. Anon. (1998a), Babarskas *et al.* (2003), Bangs & Penard (1921), Beebe (1890), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Clements & Shany (2001), Cruz & Andrews (1989), Di Giacomo (2004), ffrench (1991), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hayes & Samad (2002), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Johansson *et al.* (2002), Joseph (1996), Klimaitis & Moschione (1987), Lanyon (1985), Lee Jones (2004), Lowen *et al.* (1996), McKitrick (1985), Miller (1963), Miserendino (1998), Monroe (1968), Oren & Parker (1997), de la Peña (1987, 1989), Perry *et al.* (1997), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Robinson & Terborgh (1997), do Rosário (1996), Salaman (1994), Short (1975), Sibley & Ahlquist (1985c), Sick (1993, 1997), Skutch (1969, 1985), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Tostain *et al.* (1992), White (2002), Willis (1988), Zimmer (1930, 1936b).

PLATE 49 ➤



PLATE 49

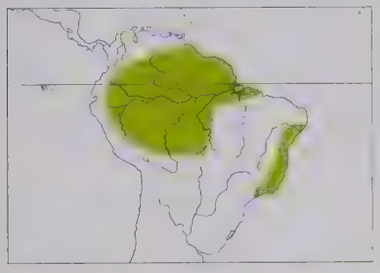
inches 2
cm 5

421. Black-capped Becard

Pachyramphus marginatus

French: Bécarde à calotte noire **German**: Streifenrückenbekarde **Spanish**: Anambé Capirotado

Taxonomy. *T[odus] marginatus* M. H. K. Lichtenstein, 1823, Bahia, Brazil.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Has been suggested that it is closely related to, and possibly conspecific with, *P. albogriseus*; the two appear to replace each other geographically and could be considered to represent a zoogeographical species. Two subspecies recognized.
Subspecies and Distribution.
P. m. nanus Bangs & T. E. Penard, 1921 - SE Colombia (E of Andes, S from S Meta and SE Guainía), S Venezuela (Amazonas, Bolívar), the Guianas, N & W Brazil (E to Maranhão and W Mato Grosso, S to Rondônia), E Ecuador, E Peru and N Bolivia.
P. m. marginatus (M. H. K. Lichtenstein, 1823) - E Brazil (Pernambuco S to NE São Paulo).



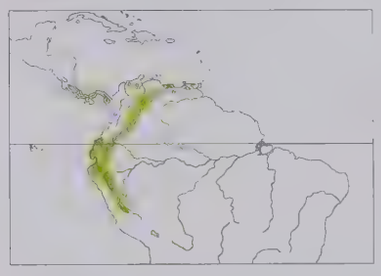
Descriptive notes. 13-14 cm; 18 g. Male has crown glossy black with blue sheen and scaly appearance, pale grey supraloral spot, narrow whitish eyering; face pale grey, extending back towards nape; upperparts with variable concentrations of black and grey (some individuals almost uniformly black, some uniformly grey, others with various relative amounts of each colour); rump grey; wings black, white scapulars, two white wingbars, fairly wide white margins on wing-coverts and remiges; tail black, innermost rectrices with small white tips, outer rectrices with broader white tips; throat uniformly pale grey or pale whitish-grey, underparts more or less uniformly pale grey, sometimes whitish-grey lower belly and vent; iris dark; bill mostly dusky or blackish; legs dusky greyish. Differs from *P. albogriseus* mainly in greyer surpaloral, darker underparts. Female has crown rufous-chestnut, greyish supraloral spot, white broken eyering, nape dusky olive, back more uniform olive (sometimes slight rufous tinge near scapulars), rump olive, wings dusky, rufescent or cinnamon-olive scapulars, broad rufous margins on coverts and inner remiges (paler in some individuals), tail dusky with buff-cinnamon tips (especially broad on outer rectrices); pale yellow below, dusky tinge especially prominent on breast. Race *nanus* is considerably smaller. Voice. Typical song a short melancholy series of clear musical notes in variable pattern, "teeu, whee-do-weét", "twee-twee-tee-eet, dear-dear" or "tewtewtewteé, dew-dew", often quickly repeated multiple times, running up scale with last 2 notes lower; often gives a quickly repeated "fleur-de-lis" phrase; also accelerating and trilled series of thin notes with even pitch, e.g. "teeu, tee-tee-tee-te-ti" or "tre-tre'tre-e-e-e-e-it", last note slightly lower; dawn song a soft, delicate, much shorter "tew, tew'tweet" that rises sharply at end.
Habitat. Canopy and interior of humid lowland forest, primarily *terra firme*, and tall second-growth woodland; less often along borders, especially in areas of lighter woodland, where seems to be more or less replaced by *P. polychopterus*. To 1000 m.
Food and Feeding. Insects and fruit. Singly or in pairs; regularly joins mixed-species foraging flocks. Actively peers; flutters or sallies, mostly short distances, to glean items, usually at middle to upper levels.
Breeding. Few specific details. Birds in breeding condition in Apr-May in N Venezuela and upper R Orinoco; gonads enlarged in Sept, SE Peru.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common; probably often overlooked. Much of this species' habitat remains in relatively pristine condition within its large range, and it is considered unlikely to be threatened. Isolated population in E Brazil perhaps at greatest risk. Occurs in many national parks and other protected areas, including Augusto Ruschi Biological Reserve, Intervales and Rio Doce State Parks and Sooretama Biological Reserve, in E Brazil.
Bibliography. Bangs & Penard (1921), Bates & Parker (1998), Butler (1979), Clements & Shany (2001), Cracraft (1985), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon (1985), McKitrick (1985), Meyer de Schauensee (1982), Naka (2004), Oren & Parker (1997), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Robinson & Terborgh (1997), Schäfer & Phelps (1954), Schubart *et al.* (1965), Schulenberg *et al.* (2001), Sick (1993, 1997), Snyder (1966), Stotz *et al.* (1996), Terborgh *et al.* (1984), Thiollay & Jullien (1998), Tostain *et al.* (1992), Walther (2004), Willard *et al.* (1991).

422. Black-and-white Becard

Pachyramphus albogriseus

French: Bécarde pie **German**: Graurückenbekarde **Spanish**: Anambé Blanquinegro

Taxonomy. *Pachyramphus albo-griseus* P. L. Sclater, 1857, "Bogotá", Colombia.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Has been suggested that it is closely related to, and possibly conspecific with, *P. marginatus*; the two appear to replace each other geographically and could be considered to represent a zoogeographical species. Racial identity of birds in NW Ecuador uncertain, as both *guayaquilensis* and *salvini* seem to occur there; some revision of races probably necessary. Five subspecies currently recognized.
Subspecies and Distribution.
P. a. ornatus Cherrie, 1891 - Costa Rica and W Panama (Chiriquí and Veraguas, possibly farther E).
P. a. coronatus Phelps, Sr & Phelps, Jr, 1953 - N Colombia (SW slope of Sierra Nevada de Santa Marta, Sierra de Perijá) and extreme NW Venezuela (Perijá Mts).
P. a. albogriseus P. L. Sclater, 1857 - NE Colombia (E slope of E Andes from N Norte de Santander S to N Boyacá and SE Nariño) and N Venezuela (Andes from Lara S to S Táchira, also Yaracuy and coastal mountains from Carabobo E to W Sucre).
P. a. guayaquilensis J. T. Zimmer, 1936 - W Ecuador (W Esmeraldas and Manabí S, including Puna I, to Guayas and El Oro).
P. a. salvini Richmond, 1899 - E Ecuador (apparently also crossing to Pacific slope in Pichincha) and NW & C Peru (Pacific lowlands S to Lambayeque and Cajamarca, also E side of C Andes from Amazonas and San Martín S to Ayacucho).



Descriptive notes. 13-14·5 cm; 18·5-26 g. Male has glossy black crown with slight bluish sheen, contrasting sharply with almost uniformly plain grey upperparts, pale grey line on nape (sometimes lacking); side of head grey, lores blackish, broad white supraloral stripes connecting narrowly on lower forehead, narrow white broken eyering on pale dusky grey face; wings blackish, broad white margins on secondaries and wing-coverts (one or two wingbars); tail blackish, more dark grey at base, quite broad white tips on rectrices; pale grey below, throat and breast more greyish-white, especially at sides, and belly and vent more whitish; iris dark; bill blue-grey with black tip (variable); legs blue-grey. Distinguished from *P. polychopterus* by white supraloral stripe, grey back with contrasting black cap, lack of white scapulars. Female has prominent chestnut-brown or dull rufous crown with marked broad black margin, white supraloral spots that extend back to form broken eyering, black stripe through eye to hindcrown, pale dusky yellowish-olive face, olive-yellow or pale olive nuchal collar (sometimes lacking), more or less dark olive-green or dusky olive upperparts, olive rump sometimes with faint rufous tinge; wings blackish, broad pale buff or brighter cinnamon margins on secondaries and wing-coverts, very narrow cinnamon edging on leading edge of primaries; tail dusky cinnamon-brown above, darker below, broad cinnamon or buff tips; throat dusky yellow or whitish, breast and sides dusky yellow or pale yellowish-olive, belly and vent pale yellow, sometimes with dusky tinge. Juvenile is similar to female but duller overall, sooty-black edging on crown feathers, less distinct supraloral stripe, more greyish cheeks, no nuchal collar, less distinct cinnamon-buff wing margins. Race *guayaquilensis* is smaller, with very slightly more grey in tail of male; *salvini* male may have whiter belly and vent, female has back somewhat duller, more greyish-olive; *ornatus* has dull flesh-coloured lower mandible; *coronatus* similar to nominate. Voice. Typical song, by male, a fast series of whistled notes, "syoo-syoo-syoo-syoo-syoo-swee", "chew-chewy ch'chewy ch'chewy", or short and melodic warbled "t'you, t'you-duéét", with variations to "chu-chu, chu-é" or "chu-u-ré", usually rising abruptly at end and given at infrequent intervals; typical call a series of variable, high and thin "swee-sweeet" or "weeea-weeeeur" whistles; partners occasionally call back and forth. Voice in Venezuela S to Peru said to be sweet mellow "chu-u-ree", sometimes varied to "cheer, chew-a-weet"; birds from W & E Ecudor said to differ, *guayaquilensis* giving pleasant "tu-tu-dwít" phrase repeated three times in succession with pause between each three-phrase series, *salvini* a more melancholy and longer "twe, twe, tweu, tu-wít" phrase with stronger inflection on final note.
Habitat. Upper levels of understorey and mid-levels of canopy, and interior (occasionally borders) of humid to wet foothill and lower montane forest, tall secondary woodland, humid or deciduous woodland adjacent to primary forest; sometimes dry forest almost to sea-level in W Ecuador and NW Peru. Primarily at mid-elevations, c. 800-2300 m; occasionally lower (especially on Pacific slope) during latter half of year; and locally at 2500-2850 m or as high as 3200 m.
Food and Feeding. Insects and fruit. Singly or in pairs; regularly joins mixed-species flocks. Generally perches calmly, scanning foliage for prey, often turning head into odd positions to peer for insects. Makes short, fluttering, upward sallies, or hover-gleans food items from foliage or twigs at higher levels of canopy.
Breeding. Mar-Apr in Costa Rica. Nest bulky and globular, entrance hole near bottom, composed mostly of dead leaves, with some moss, bits of vines, various plant fibres, etc., generally wedged in vertical fork near tip of trunk or tree branch 7-20 m above ground in subcanopy or forest edge. Clutch size uncertain; incubation by female, period thought to be c. 18-21 days; nestling period probably c. 20-22 days.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Fairly common in Henri Pittier National Park, in Venezuela, and found also in Cerro Blanco Forest Reserve, Río Palenque Science Centre and Podocarpus National Park, all in Ecuador, and Northwest Peru Biosphere Reserve, in Peru.
Bibliography. Anon. (1998a), Blake (1958), Butler (1979), Clements & Shany (2001), Davies *et al.* (1994), Eisenmann (1955), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Lanyon (1985), McKitrick (1985), Meyer de Schauensee (1982), Phelps & Phelps (1953), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Salaman (1994), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Zimmer (1936b).

423. Grey-collared Becard

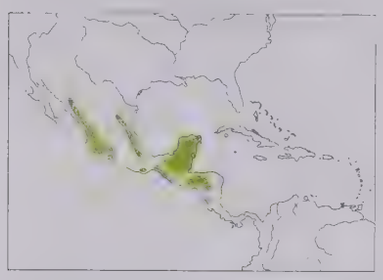
Pachyramphus major

French: Bécarde du Mexique **German**: Schwarzrückenbekarde **Spanish**: Anambé Mexicano
Other common names: Mexican Becard

Taxonomy. *Bathmidurus major* Cabanis, 1847, Jalapa, Veracruz, Mexico.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Specimens from Honduras not racially identifiable; tentatively included in *australis*, but could belong with *itzensis*. Five subspecies currently recognized.
Subspcies and Distribution.
P. m. uropygialis Nelson, 1899 - W Mexico (S Sonora S to Guerrero).
P. m. major (Cabanis, 1847) - E Mexico (S Nuevo León and San Luis Potosí S to Oaxaca and W Chiapas).

On following pages: 424. Glossy-backed Becard (*Pachyramphus surinamus*); 425. Rose-throated Becard (*Pachyramphus aglaiae*); 426. Jamaican Becard (*Pachyramphus niger*); 427. One-coloured Becard (*Pachyramphus homochrous*); 428. Pink-throated Becard (*Pachyramphus minor*); 429. Plain Becard (*Pachyramphus validus*).

P. m. itzensis Nelson, 1901 - SE Mexico (Campeche, Yucatán, Quintana Roo).
P. m. matudai A. R. Phillips, 1966 - S Mexico (Pacific slope of Chiapas) and Guatemala.
P. m. australis W. deW. Miller & Griscom, 1925 - Guatemala, El Salvador, Honduras and NC Nicaragua.



Descriptive notes. 14-15·5 cm. Male nominate race has glossy black crown, pale supraloral stripe, pale grey hindcollar; back black or mottled grey and black, rump and uppertail-coverts grey; wings black, white scapular stripe, white margins on wing-coverts, secondaries and tertials; primary P9 shorter and attenuated; tail black, broad white tips on outer rectrices; uniformly light grey below; iris dark; bill blackish, often paler greyish to greyish-flesh on lower mandible; legs dark grey. Female has blackish-brown to glossy blackish crown, pale supraloral stripe, pale cinnamon to tawny-buff hindcollar, cinnamon-brown upperparts, blackish wings (unmodified P9) with cinnamon to cinnamon-brown margins on coverts, secondaries and tertials, tail with broad cinnamon tips and more cinnamon-brown central rectrices (often with black subterminal mark), buff to cinnamon-buff throat and underparts. Juvenile resembles female; quickly acquires immature plumage, male may show some blackish mottling on back, have lemon-buff margins on wings, grey-brown central rectrices with blackish distal marks, whitish tips on outer rectrices, like adult by c. 1 year. Race *uropygialis* male resembles nominate, female has cinnamon-rufous crown, contrasting broad black eyeband, much pales yellowish hindcollar, throat and underparts; *itzensis* male has mostly grey back; *matudai* has buffish-lemon underparts; *australis* slightly smaller than nominate, male rather paler, female darker than nominate female. Voice. Typical song a rich and constantly repeated (usually 4-6 times, and ten in 10 seconds) "hoo wee-deet" or "hu whi-ditt" whistle; also gives more plaintive to clear "peeu peeu" and longer "beeh beeh beeh" series, repeated up to 6-7 times.

Habitat. Humid to semi-arid forest, especially pine (*Pinus*) and oak (*Quercus*), forest edges, plantations. To 2500 m.

Food and Feeding. Insects and fruits. Singly or in pairs; occasionally joins mixed-species flocks. Forages at middle to upper levels.

Breeding. Nest with nestlings in Aug, Michoacán; nest was c. 10 m above ground in fork of oak tree (*Quercus*); 35 cm high, 22 cm deep, 23 cm wide; nest roughly globular, with slanting roof; nest built of lichens, twigs and pine needles, roof made of strips of bark held together with silk from butterfly cocoons. Both parents appear to tend and feed fledglings.

Movements. Apparently an altitudinal migrant, at least N of Isthmus of Tehuantepec.

Status and Conservation. Not globally threatened. Uncommon to fairly common, but local. Not well known. Occurs in Insurgente José María Morelos y Pavón National Park (Michoacán), in Mexico, and Lamanai Archaeological Reserve and Río Bravo Conservation and Management Area, both in Belize.

Bibliography. Anon. (1998a), Binford (1989), Brodkorb (1943), Chapman (1896), Contreras (1997), Gelis & Martínez (2000), Howell & Webb (1995a), Hutto (1992), Klaas (1968), Land (1970), Lanyon (1985), McKitrick (1985), Monroe (1968), Paynter (1955), Phillips (1966), Prum *et al.* (2000), Ridgway (1907), Schaldach (1963), Smithe (1966), Storer (1961), Stotz *et al.* (1996), Thurber *et al.* (1987), Watson (1999), Wetmore (1943), Winker *et al.* (1999).

424. **Glossy-backed Becard**

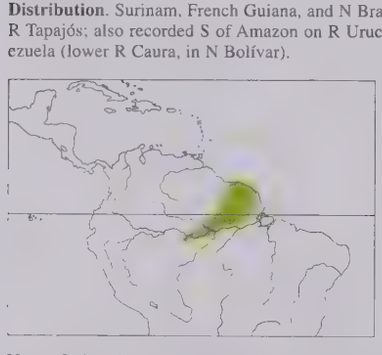
Pachyramphus surinamus

French: Bécarde du Surinam **German**: Weißbauchbekarde **Spanish**: Anambé de Surinam

Taxonomy. [*Muscicapa*] *surinama* Linnaeus, 1766, Surinam.

Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Monotypic.

Distribution. Surinam, French Guiana, and N Brazil (from lower R Negro at Manaus E almost to R Tapajós; also recorded S of Amazon on R Urucu, in C Amazonas); one sight record from Venezuela (lower R Caura, in N Bolívar).



Descriptive notes. 13·2-13·8 cm; 20 g. Male is glossy black above, slight bluish sheen, crown sometimes scaly-looking; some white near bases of scapulars (often concealed); pure white below; iris dark; bill blackish; legs dark. Female has blackish crown feathers broadly tipped dark chestnut-brown (appears chestnut with black spots), pale supraloral line, pale grey nape and upper back, white lower back to rump, blackish wings with fairly broad cinnamon-rufous edging on inner remiges and coverts, blackish tail, outermost rectrices with broad whitish to buffy tips, buffy tinge uppertail-coverts, throat and underparts white. Voice. Soft and sweet-sounding dawn song, usually from semi-concealed perch high in canopy, a series of c. 5-9 notes, "wuweet, weet-weet-weet-weet-weet", repeated at intervals of 5-9 seconds; when foraging, also frequently "kweeé, kew-kew-kew-kew" contact call, somewhat variable, up to 5 "kew" notes; when agitated, also longer series of thin notes faster and trilled towards end, "wee, tee-tee-te-ti'ti'ti'ti'ti'ti'ti".

Habitat. High canopy of emergent trees, subcanopy of tall humid forest, and forest borders, also adjacent clearings and savanna forest; to 300 m.

Food and Feeding. Insects, some fruit. Usually observed in pairs, partners loosely associated. Moves about at rather deliberate pace, peering into thick foliage in high outer canopy of emergent trees or along bare horizontal branches; makes short hops or flights of 0·5-10 m to hover-glean items; rarely, sally-gleans. Appears sometimes to fly long distances to preferred foraging trees; territory thought to be rather large (more than 100 ha).

Breeding. Nests discovered Jul-Oct in Brazil. Nest bulky and globular, entrance hole on side or near bottom, composed of dead leaves, fibres, moss, etc., suspended from drooping branch c. 25-30 m up in tree, usually near nest of wasp or bee (Hymenoptera). No other specific information.

Movements. None known.

Status and Conservation. Not globally threatened. Rare and apparently local. Poorly known; perhaps often overlooked, as it spends most time in canopy. Future range extensions for this species considered likely. Occurs in Jaú National Park and the Ducke Reserve, in Brazil.

Bibliography. Cohn-Haft *et al.* (1997), Cracraft (1985), Forrester (1993), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Lanyon (1985), McKitrick (1985), Meyer de Schauensee (1982), Naka (2004), Oniki & Willis (1982), Prum *et al.* (2000), Ridgely & Tudor (1994), Sick (1993, 1997), Stotz *et al.* (1996), Thiollay & Jullien (1998), Tostain *et al.* (1992), Whittaker (1995).

425. **Rose-throated Becard**

Pachyramphus aglaiae

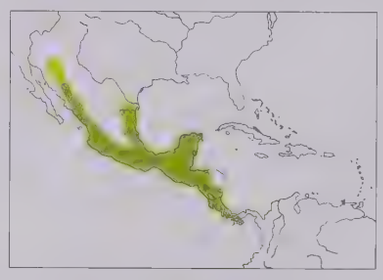
French: Bécarde à gorge rose **German**: Rosenkehlbekarde **Spanish**: Anambé Degollado

Taxonomy. *Pachyrhrynchus Aglaiae* Lafresnaye, 1839, vicinity of Jalapa, Veracruz, Mexico.

Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Has been suggested that it is closely related to *P. homochrous*, *P. minor* and *P. validus*, or even conspecific with first two; all are sometimes combined in a separate genus, *Platypsaris*, differing from present genus in nest shape and placement, as well as in some vocal and minor morphological characters. Racial variation poorly understood; revision clearly necessary. Eight subspecies currently recognized.

Subspecies and Distribution.

P. a. albiventris (Lawrence, 1867) - SW United States (SE Arizona), W Mexico (Sonora and Pacific slope from S Sinaloa S to N Guerrero, also up river valleys E to Chihuahua, Zacatecas and Morelos).
P. a. insularis (Ridgway, 1887) - Tres Marías Is, off W Mexico (Nayarit).
P. a. gravis (van Rossem, 1938) - extreme S USA (S Texas) and coastal region of NE Mexico. (Tamaulipas S to Nuevo León and San Luis Potosí).
P. a. aglaiae (Lafresnaye, 1839) - S Mexico (C & S Guerrero E to S Oaxaca and WC Veracruz).
P. a. sumichrasti (Nelson, 1897) - SE Mexico (C Veracruz S to N & SE Oaxaca, E to Campeche) and W Guatemala.
P. a. yucatanensis (Ridgway 1906) - Yucatán Peninsula.
P. a. hypophaeus (Ridgway, 1891) - Caribbean slope from C Belize and Guatemala S to W Panama.
P. a. latirostris Bonaparte, 1854 - Pacific slope from N El Salvador S to NW Costa Rica.



Descriptive notes. 16·5-18 cm; 33 g. Distinctive. Male nominate race is uniform grey to darker slaty grey above, with contrasting glossy blackish crown and side of head; mostly grey below, with prominent rose-pink lower throat and upper chest; primary P9 shorter and attenuated; iris dark; bill black, lower mandible sometimes paler, blue-grey; legs dark grey or plumbeous. Female has dark slate-grey or brownish-blackish crown with contrasting ochraceous-buff hindcollar, paler lores, tawny-rufous back, brighter rufous wings (normal P9) and tail, ochraceous-buff tinge cheek, neck side, throat and underparts. Juvenile male more or less resembles female but duller above, very faint ochraceous nuchal collar, generally paler below; immature usually has mottled blackish-and-grey upperparts, some pinkish on throat; adult plumage attained by c. 1 year. Race *albiventris* is much paler than nominate, male with paler pink throat, whitish-grey lower underparts, female with pale buff neck, thoat and underparts; *gravis* female has more cinnamon-brown upperparts, buff neck, throat and underparts; *hypophaeus* is much darker, male with more blackish head and upperparts, very dark grey underparts, pinkish area of throat less extensive or entirely lacking, female with sooty-blackish crown contrasting with prominent cinnamon on side of neck, pale lores, narrow buff nuchal collar, deep rufous to rufous-brown upperparts, also with throat and underparts more uniformly ochraceous buff or tawny; *latirostris* is like previous, more blackish-slate above, slate-grey below, darker on breast; *yucatanensis* similar to nominate but has paler underparts; *sumichrasti* much darker than nominate; *insularis* similar to *yucatanensis* but smaller, especially bill. Voice. Commonly heard call a plaintive downslurred "t-sseu", "tzeeu", or shorter "sseeu" or "teew", often changing to rolling chatter or trill, sometimes chattering slurs into plaintive "tcheu" or "tew" calls; variety of strident, high-pitched, and squeaky thin "wheeeiii" or "p'eeeeeii" whitsles often with rising inflection; dawn song a slightly reedy and plaintive "si-tchew wii-chew" or "si-tseeu wii-tzeeu", repeated in various combinations, or longer and more continuous repetition of "wheeuu-whyeeeuur"; also gives quiet "pik" and "pii-dik" alarm close to nest. Perhaps less vocal than most congeners.

Habitat. Various types of forest edge, including pine-oak (*Pinus-Quercus*), canopy of deciduous woodland and evergreen gallery forest and other riparian areas, clearings and open areas with scattered trees, and patches of scrubby second growth. Mostly in lowlands to 300 m, but has been recorded to 2700 m.

Food and Feeding. Insects; also considerable quantities of small fruits and arillate seeds (e.g. *Stemmadenia*). Singly or in pairs, and occasionally with groups of other small birds; often joins mixed-species foraging flocks. Sally-gleans insects and caterpillars by striking foliage, or hawks flying insects; fruits and seeds gleaned.

Breeding. Apr-Jun in Costa Rica. Nest bulky and globular or bell-shaped, up to c. 76 cm long, entrance hole at or near bottom, made from dead leaves, dry vines, grass stems, twigs, various plant fibres, often with bits of *Ceiba* floss or *Inga* flowers worked into the structure, sometimes bits of green vegetation adorning exterior; generally hanging from tip of drooping tree branch c. 4-21 m above ground, often over water. Clutch 3-4 eggs; incubation by female, period c. 18-21 days; chicks fed by both parents, nestling period between c. 20 and 30 days.

Movements. No large-scale movement thought to occur. Populations in N Mexico (N Sonora and Nuevo León) appear to move S during Sept-Feb, perhaps further evidenced by local records in W Panama (including Jan in Santa Clara, and Dec and Feb in Volcán); in addition, observations in Panama of pairs and males without pink on throat suggest smaller-scale movement by more S races (*latirostris* or *hypophaeus*).

Status and Conservation. Not globally threatened. Uncommon to common. Estimated global population 2,000.000 individuals. Status in Panama requires clarification; although conceivably resident, absence of this species in adjacent areas of Costa Rica render this unlikely. Occurs in Río Bravo Conservation and Management Area, Columbia River Forest Reserve and Lamanai Archaeological Reserve, in Belize, and Tarcol Lodge, Carara Biological Reserve and Río Negro Jaguar Reserves, in Costa Rica.

Bibliography. Anon. (1998a), Baicich & Harrison (1997), Bent (1942), Binford (1989), Brodkorb (1943), Chapman (1896), Contreras (1997), Dearborn (1907), DeGraaf & Rappole (1995), González-García (1993), Hejl *et al.* (1995), Howell & Webb (1995a), Hutto (1992), Kaufman (1996), Land (1970), Lanyon (1985), Lee Jones (2004), Lowery & Dalquest (1951), McKitrick (1985), Mlodinow & O'Brien (1996), Monroe (1968), Paynter (1955, 1957), Prum *et al.* (2000), Ridgely & Gwynne (1989), Ridgway (1891, 1907), Rowley (1984), Schaldach (1963), Skutch (1969), Slud (1960, 1964, 1980), Smithe (1966), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996), Urban (1959), Webster (1963), Wetmore (1943).

426. Jamaican Becard

Pachyramphus niger

French: Bécarde de Jamaïque **German**: Jamaikabekarde **Spanish**: Anambé Jamaicano

Taxonomy. [*Lanius*] *niger* J. F. Gmelin, 1788, Jamaica.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Monotypic.
Distribution. Jamaica.



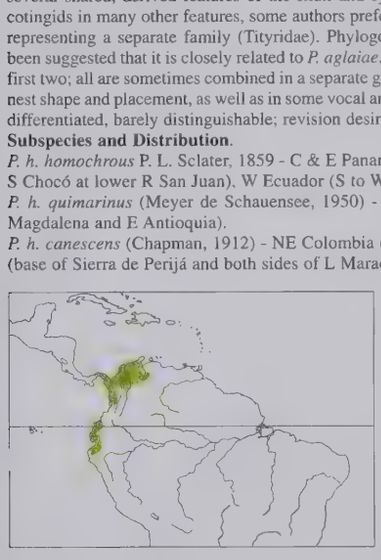
Descriptive notes. 18 cm. Male is entirely black, except for white mark at base of wing (in flight); iris dark; bill black; legs blackish. Female has deep brown crown, reddish-brown upperparts, cinnamon cheek, neck and throat to upper breast, pale grey underparts. Immature is similar to female. Voice. Typical vocalization 2 hoarse "queeck" notes, followed by melodic and syncopated but not well-defined phrase that rises in pitch before falling on last two syllables, and described as sounding like "Co-ome and tell me what you hee-ear".
Habitat. Tall but mostly open forest and edges in hills and mountains; also observed in more closed forest, woodland, pastures with scattered trees, and gardens. Low to middle elevations.
Food and Feeding. Insects and fruit. Moves rather casually beneath canopy, occasionally hovering briefly to glean prey from twigs; also hawks flying insects and sally-gleans food items.
Breeding. Mar-Jun; more than one brood may be raised per season. Nest quite large, bulky and globular, entrance hole near bottom, composed of variety of plant materials, suspended from branch, sometimes above canopy, also lower within woodland or more open areas. Clutch 3 eggs. No other specific details.
Movements. May move to lower elevations when not breeding.
Status and Conservation. Not globally threatened. Restricted-range species: present in Jamaica EBA. Widespread and locally fairly common. About 75% of original forest cover on Jamaica has already been cleared, and remaining forest is largely second growth. Nevertheless, this species survives well in secondary habitats and is tolerant of disturbed habitats.
Bibliography. Anon. (1998a), Bond (1985), Faaborg (1985), Lanyon (1985), McKitrick (1985), Prum *et al.* (2000), Raffaele *et al.* (1998, 2003), Ridgway (1907), Stotz *et al.* (1996).

427. One-coloured Becard

Pachyramphus homochrous

French: Bécarde unicolore **German**: Einfarbbekarde **Spanish**: Anambé Unicolor

Taxonomy. *Pachyramphus homochrous* P. L. Sclater, 1859, Pallatanga, Chimborazo, Ecuador.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Has been suggested that it is closely related to *P. aglaiae*, *P. minor* and *P. validus*, or even conspecific with first two; all are sometimes combined in a separate genus, *Platypsaris*, differing from present genus in nest shape and placement, as well as in some vocal and minor morphological characters. Races weakly differentiated, barely distinguishable; revision desirable. Three subspecies currently recognized.
Subspecies and Distribution.
P. h. homochrous P. L. Sclater, 1859 - C & E Panama, W Colombia (Pacific slope of W Andes S to S Chocó at lower R San Juan), W Ecuador (S to W Loja) and NW Peru (Tumbes, N Piura).
P. h. quimarinus (Meyer de Schauensee, 1950) - NW Colombia (Sinú Valley of Bolívar E to S Magdalena and E Antioquia).
P. h. canescens (Chapman, 1912) - NE Colombia (NE Bolívar, N Magdalena) and NW Venezuela (base of Sierra de Perijá and both sides of L Maracaibo).



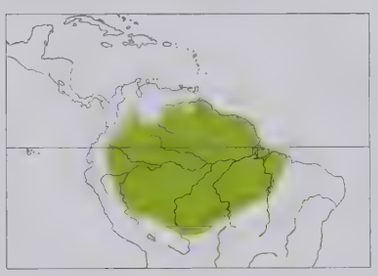
Descriptive notes. 16·5 cm; 35 g. Male is mostly dark slaty grey, crown more blackish, rump slightly paler than back; wings and tail, remiges with very narrow, almost indistinguishable, paler margins; grey below, somewhat paler than upperparts, sometimes faint pinkish wash on lower throat or throat sometimes slightly paler grey, sometimes slight dusky tinge on chest and upper belly; iris dark; bill heavy, slightly hooked, blackish; legs dusky. Female is uniformly rufous-chestnut to rufous-tawny above, including crown and tail, often with some dusky feathers around eye area, whitish-cinnamon supraloral, buff-cinnamon face, dusky primaries eged cinnamon, rufous secondaries and wing-coverts with narrow pale cinnamon margins; mostly buffy cinnamon below, more whitish and cinnamon-tinged on throat, more buffy cinnamon on breast and crissum. Juvenile male is similar to female; gradually becomes more black and grey, first on crown and back, lastly on wings and tail. Race *quimarinus* is essentially like nominate; *canescens* may have slightly more whitish below, especially on throat and belly. Voice. Typical song a rather variable, loud, sharp, and sputtering or chattering "stet-ee-ee-teet-tsit-tsit-tsitts-tsít" or "ske-e-et'et'ittt, tseer, tsrip", less clear and not nearly so musical as that of most congeners; also frequently gives squeaky and high-pitched "tweíuuw".
Habitat. Canopy and borders of various types of humid to dry and deciduous forest, adjacent clearings with scattered large trees, secondary and gallery woodland, and disturbed semi-open arid woodland and xeric scrub with scattered tall trees. Mostly below 1000 m, but recorded to c. 1500 m in Ecuador (Chimborazo).
Food and Feeding. Insects and fruit. Usually in pairs, sometimes singly; sometimes joins mixed-species flocks. Forages at mid-levels to subcanopy at forest edges or lighter woodland, sometimes interior. Often nods or pumps the head, much as do *Myiarchus* species; regularly raises crown feathers.
Breeding. No specific information.
Movements. None known.
Status and Conservation. Not globally threatened. Uncommon to common. In Panama, more common in E than in areas farther W. Fairly common, and seen daily, in Northwest Peru Biosphere Reserve, in Peru. Occurs also in Darién National Park, in Panama, and Cerro Blanco Forest Reserve, "Jardin Tropical" (near Esmeraldas), Machalilla National Park, Loma Alta Ecological Reserve and Río Palenque Science Centre, all in Ecuador.
Bibliography. Anon. (1998a), Clements & Shany (2001), Haffer (1975), Butler (1979), Eisenmann (1955), Hilty (2003), Hilty & Brown (1986), Lanyon (1985), McKitrick (1985), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1994), Ridgway (1907), Sclater & Salvin (1879), Snow, D.W. (1973b), Stotz *et al.* (1996), Walker (2002), Williams & Tobias (1994).

428. Pink-throated Becard

Pachyramphus minor

French: Bécarde de Lesson **German**: Rosensternbekarde **Spanish**: Anambé Gorgirrosa

Taxonomy. *Querula minor* Lesson, 1830, Cayenne, French Guiana.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Has been suggested that it is closely related to *P. aglaiae*, *P. homochrous* and *P. validus*, or even conspecific with first two; all are sometimes combined in a separate genus, *Platypsaris*, differing from present genus in nest shape and placement, as well as in some vocal and minor morphological characters. Monotypic.
Distribution. Most of Amazonia, from SE Colombia (E of Andes, from W Meta and Vaupés S to Amazonas), S & E Venezuela (Amazonas, Bolívar) and the Guianas S to E Ecuador, E Peru, N Bolivia (La Paz, Beni, N Santa Cruz) and S & C Brazil (S to Rondônia, W & N Mato Grosso, N Tocantins, Pará and N Maranhão).



Descriptive notes. 16·5-17 cm; 37 g. Male is more or less uniformly black, face slightly paler greyish-black, except for some white at bend of wing (sometimes hidden); marginally paler below, patch of rosy pink on throat and upper chest (sometimes rather indistinct); iris dark; bill heavy, slightly hooked, blackish; legs dark. Female has crown and nape greyish-brown, buffy supraloral spot, partially grey upperparts that contrast with rufous wings and tail, greyish rump with rufous tinge, throat and underparts uniformly buff. Voice. Relatively quiet compared with most congeners; typical song a clear musical "teeuuuweeet" that is frequently followed by series of twittering notes; also gives clear rising whistle, "tyoooeee"; also soft "pik" or "tic" call notes.
Habitat. Tall humid lowland forest, primarily *terra firme* but occasionally also *várzea*, from mid-storey to subcanopy and borders; to 800 m.
Food and Feeding. Large insects, fruit. Usually observed singly or in pairs, occasionally in small family groups; regularly joins mixed-species foraging flocks. Sluggish; perches upright, frequently bobs its head; typically peers about the vegetation, and changes perch just once to a few times before moving on to different foraging tree. Generally sallies upwards for short distances to the air, but more often to foliage, taking food items in a sally-stall.
Breeding. Nest-building in late Jun and late Aug, in Ecuador. Nest is bulky globular mass suspended from tree, c. 10-20 m above ground; both sexes apparently participate in construction.
Movements. Presumably resident.
Status and Conservation. Not globally threatened. Rare to fairly common; perhaps often overlooked. As much of this species' habitat remains in relatively undisturbed condition within its large range, it is not considered to be at any risk. Occurs in many national parks and other protected areas, e.g. Tambopata-Candamo Reserved Zone and Manu National Park and Biosphere Reserve, in Peru, Beni and Pilón Lajas Biosphere Reserves and Madidi and Noel Kempff Mercado National Parks, in Bolivia, and Tapajós National Park, in Brazil.
Bibliography. Anon. (1998a), Bangs & Penard (1918), Bates & Parker (1998), Clements & Shany (2001), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Lanyon (1985), McKitrick (1985), Meyer de Schauensee (1982), Oniki & Willis (1982), Oren & Parker (1997), Peres & Whittaker (1991), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), Schulenberg *et al.* (2001), Sick (1993, 1997), Snow, D.W. (1973b), Snyder (1966), Stotz *et al.* (1996), Terborgh *et al.* (1984), Tostain *et al.* (1992).

429. Plain Becard

Pachyramphus validus

French: Bécarde huppée **German**: Schopfbekarde **Spanish**: Anambé Grande
Other common names: Crested Becard

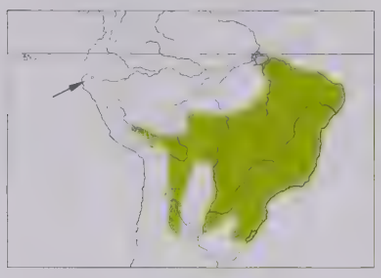
Taxonomy. *Lanius validus* M. H. K. Lichtenstein, 1823, Paraguay.
Genus formerly included with *Tityra* in the Cotingidae, but transferred to present family because of several shared, derived features of the skull and syrinx. Because both genera exhibit similarity to cotingids in many other features, some authors prefer to leave them in that family or to treat them as representing a separate family (Tityridae). Phylogenetic affinity of present species unknown. Has been suggested that it is closely related to *P. homochrous*, *P. minor* and *P. aglaiae*; all are sometimes combined in a separate genus, *Platypsaris*, differing from present genus in nest shape

and placement, as well as in some vocal and minor morphological characters. Apparently isolated population discovered in 1998 in SE Ecuador (S Zamora-Chinchipe), more than 1000 km N of previously recorded N limit in S Peru, tentatively included in race *audax*, but may represent an undescribed taxon. Two subspecies currently recognized.

Subspecies and Distribution.

P. v. validus (M. H. K. Lichtenstein, 1823) - E & S Brazil (Marajó I E to Rio Grande do Norte, S to Mato Grosso and Rio Grande do Sul), E Bolivia (Chiquitos), Paraguay and NE Argentina (S to Santa Fe).

P. v. audax (Cabanis, 1873) - extreme SE Ecuador (S Zamora-Chinchipe), SE Peru (both slope of Andes S from Ayacucho and Cuzco), NW, C & S Bolivia (La Paz S to Tarija) and NW Argentina (Saltá, Tucumán, Catamarca, La Rioja, Córdoba).



Descriptive notes. 17-18·5 cm. Male nominate race is very dark greyish to almost black above, with semi-concealed white patch on back; face more greyish, supraloral spot paler smoky grey, some white on scapulars; below, almost entirely uniform pale smoky greyish with prominent cinnamon tinge, throat a bit paler, more whitish-grey; iris dark brown; bill very stout, upper mandible black, lower mandible medium grey; legs dark grey. Female has dark greyish crown contrasting highly with bright rufous nape, upperparts and tail; cinnamon face, duller buff-greyish supraloral spot, wings mostly dusky but with narrow rufous edging on primaries, rufous inner remiges; yellowish-cinnamon throat, dull buffyish-cinnamon underparts. Juvenile presumably resembles female. Race *audax* male is more uniformly greyish below with only slight cinnamon tinge, more greyish-white throat, darker wings; female has dirtier black or sooty crown, slightly darker wings with more dusky inner remiges and coverts, darker underparts. Voice. Not especially vocal compared with most congeners; typical vocalizations comprised of various squeaky or twittering notes; song a low, clear, vibrating, descending series of 6-8 "dui" whistles, second note highest; typical call a shrill "tsree" whistle; calls of nominate said to be fine rising "tsri", "si-i-it" and "tuit".

Habitat. Woodland or montane-forest canopy and borders (especially balsa) and wooded slopes of wet ravines in semi-arid to semi-humid areas. Lowlands to 2000 m, but recorded at 3500 m in Peru (above Urubamba, in Cuzco).

Food and Feeding. Large insects. Usually seen singly, or occasionally among mixed-species flocks. Perches, scanning the vegetation for prey, for c. 3-4 seconds before changing to new perch.

Breeding. Nests found in Nov and Jan in Argentina. Nest bulky and globular, entrance hole on side or near bottom, made from dead leaves, fibres, moss and other vegetable matter, suspended from tip of branch. Clutch 4 eggs. No other information.

Movements. None known.

Status and Conservation. Not globally threatened. Uncommon to fairly common. Rare in Peru, but present in Tambopata-Candamo Reserved Zone. Recent discovery of this species, including an immature male, in Ecuador, in Jan 1998, suggests possibility that range may be more extensive than currently realized; hitherto recorded in this country at only a single locality (Quebrada Honda, in S Zamora-Chinchipe). Elsewhere, occurs in many national parks and other protected areas.

Bibliography. Anon. (1998a), Brooks *et al.* (1993), Canevari *et al.* (1991), Chesser (1997), Clements & Shany (2001), Di Giacomo (2004), Dubs (1992), Fjeldså & Krabbe (1990), Hayes (1995), Joseph (1996), Lanyon (1985), Lowen *et al.* (1996), McKitrick (1985), Meyer de Schauensee & Phelps (1978), Narosky & Yzurieta (1993), Nores *et al.* (1983), de la Peña (1989), Prum *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Tudor (1994), do Rosário (1996), Schubart *et al.* (1965), Short (1975), Sick (1993, 1997), Snow, D.W. (1973b), Stotz *et al.* (1996), Willis (1988), Zimmer (1936b).

Class AVES

Order PASSERIFORMES

Suborder ACANTHISITTAE

Family ACANTHISITTIDAE (NEW ZEALAND WRENS)



- Tiny to small birds with fine pointed bill, short rounded wings, very short tail, and rather drab plumage.
- 7-10 cm.



- New Zealand.
- Forest (especially of southern beech) and scrub, from sea-level to the tree-line; 1 species in alpine and subalpine areas, including screes and rockfalls.
- 2 genera, 3 species, 6 taxa.
- 1 species threatened, almost certainly extinct; 1 other species extinct since 1600.

Systematics

The New Zealand wrens have a zoological importance out of all proportion to their restricted world distribution and limited diversity, not to mention their faint vocalizations, small size and comparative drabness. Recent studies, involving analysis of DNA, indicate that they are the most "primitive" of the living passerines, in the sense that their ancestors were the earliest to diverge from the main passerine lineage. New Zealand wrens cast light on the evolution and relationships of passerine birds in general, supporting the contention that the passerines had a Gondwanan origin, with an early radiation of forms in the Cretaceous. Superficially, they resemble the "true" wrens (Troglodytidae), but the two groups are not closely related. Indeed, the northern wrens are songbirds, members of the oscine passerines, whereas the New Zealand wrens do not belong in that assemblage.

The anatomical distinctiveness of the New Zealand wrens was first recognized in the early 1880s. Dissections carried out by W. A. Forbes showed that the Rifleman (*Acanthisitta chloris*) and the Bush Wren (*Xenicus longipes*) have the suboscine condition of the syrinx, without intrinsic muscles. About two decades later, at the beginning of the twentieth century, anatomical studies revealed that the ear opening is unusual, being a narrow horizontal slit that opens to a pocket, which extends downwards to the inner ear. Additional distinctive features of the acanthisittids are that the scutellation of the tarsus is unusual, and the form of the inner ear bone, the stapes, is unique. Moreover, New Zealand wrens have only ten rectrices, whereas other passerines have twelve.

Since the 1880s, the New Zealand wrens have usually been placed in a family of their own, Acanthisittidae, created by C. J. Sundevall in 1872; this name has priority over "Xenicidae", coined by Forbes in 1882. For a century, however, there was no agreement as to which groups of New or Old World suboscines were their closest relatives. Furthermore, some research carried out in the 1970s even suggested that the acanthisittids were more closely related to oscines than they were to suboscines.

Studies undertaken in the 1980s, using the DNA-DNA hybridization technique, indicated that the members of this family have no close living relatives, and that they are sufficiently distinctive to warrant their own infraorder, which is a sister-group to all the other suboscine families. The most recent DNA studies appear to be in line with these findings, indicating that the New Zealand wrens are the sister-taxon to all other extant passerines.

The Acanthisittidae are the only survivors of a lineage that was isolated when New Zealand broke away from the ancient southern continent of Gondwana 85-82 million years ago. Thus, they diverged from the other passerines during the Cretaceous. As such, they may be among the oldest living groups of New Zealand endemic birds, older even than the kiwis (Apterygidae). Nevertheless, and in line with New Zealand's very sparse record of terrestrial animals before the Pliocene, there is no fossil record of acanthisittids dating before the Pleistocene. Holocene fossil bones of New Zealand wrens are, however, relatively common in some cave sites, and in deposits accumulated by avian predators.

A summary of the taxonomic history of the family highlights the uncertainty that has surrounded the relationships of these birds. In 1882, Forbes found that the syrinx not only lacked intrinsic muscles, but was also located in the bronchi; because this condition, known as haploophone, exists only in some of the suboscines, he considered that the New Zealand wrens were allied to the New World cotingas (Cotingidae), manakins (Pipridae) and tyrant-flycatchers (Tyrannidae), the Old World pittas (Pittidae) and, possibly, the Madagascan asities (Philepittidae). In reviewing Forbes's study, P. L. Sclater concluded that the Acanthisittidae were closest to the Pittidae, and he placed them between the latter and the broadbills (Eurylaimidae). A year later, in 1893, H. F. Gadow included them between the Pittidae and the Tyrannidae.

Soon thereafter, some confusion arose over the syringeal musculature of the Acanthisittidae. Despite the earlier findings of Forbes, both F. E. Beddard and, in 1905, W. P. Pycraft thought that they had detected an intrinsic syringeal muscle in acanthisittids. Further, Pycraft's anatomical studies led him to conclude that the New Zealand wrens should be placed in a suborder along with tracheophone groups, namely the New World antbirds (Formicariidae), woodcreepers (Dendrocolaptidae), ovenbirds (Furnariidae) and gnateaters (Conopophagidae). He felt that they were more or less closely related to the "synallaxine group" of the Furnariidae, the skull of which was most like that of the Rifleman; in addition, the Rifleman and all of the ovenbirds had schizorhinal nares and the same slender form of the maxillo-palatine processes.

Through much of the twentieth century, the classifications proposed by Forbes and Pycraft were interpreted in varying ways by systematists. The Acanthisittidae have been placed by various authors between the pittas and the Australian scrub-birds (Atrichornithidae), between the pittas and the asities, and as the first family in a superfamily of haploophones that contained also



Like all New Zealand Wrens, the diminutive ***Rifleman*** *is a dinky bird with a very short tail. It is most common in tracts of* Nothofagus *forest, although it will venture into scrublands and gardens where these adjoin native vegetation. It forages like a treecreeper, clinging to trunks and climbing upwards, often in a spiral, until it drops down to the base of the next tree. As it climbs, it hunts the bark for insects, such as beetles, crickets, and caterpillars. In general, the Rifleman forages very actively, constantly flicking its wings and never staying still for more than a moment.*

[*Acanthisitta chloris chloris*, Codfish Island, New Zealand. Photo: Peter Reese/ BBC NPL]

the two last-mentioned families and the New World tyrannoids. This superfamily treatment was put forward by E. Stresemann, in 1934, and a close relationship among its constituent families was recognized by most subsequent authors.

In 1970, C. G. Sibley, in a comparative study of egg-white proteins of passerines, discovered numerous differences between *Acanthisitta* and the New World suboscine groups. He suggested the possibility that the New Zealand wrens were much closer to the oscines, and concluded that a close relationship among the Eurylaimidae, the Acanthisittidae and the Pittidae was highly unlikely. In the following year, P. L. Ames's work on syringeal morphology demonstrated that, contrary to the views of Beddard and Pycraft, published decades earlier, neither *Acanthisitta* nor *Xenicus* possessed intrinsic syringeal muscles. Ames was also of the opinion that the family showed no obvious relationship to any of the New World tyrannoid groups.

Apparent agreement with Sibley came in the mid-1970s, with the publication of A. Feduccia's extensive research work on the passerine stapes. Feduccia came to the conclusion that the acanthisittids were not close to the modern suboscines and that their closest living relatives were among the oscines. He followed this, however, with the iconoclastic proposal that the oscines and suboscines could not have shared a common ancestor, and that the New Zealand wrens were therefore oscines. Although further studies by Feduccia and his team soon led to a retraction of this suggestion regarding passerine phylogeny, Feduccia preferred to retain the Acanthisittidae with the oscines. At the same time, he expressed doubt as to the significance of the stapes in determining avian relationships, while also pointing out that the stapes of *Acanthisitta* differs from that of all other birds.

The initial results of Sibley and colleagues' DNA-DNA hybridization studies, published in 1982, indicated that the New Zealand wrens were the sister-group to the suboscines. Two years later, R. J. Raikow also concluded, from analysis of the hindlimb myology of the New Zealand wrens, that the family was outside the suboscine radiation; he further stated that the syringeal anatomy excluded the acanthisittids from the oscine group.

It is clear, then, that the true relationships of this family have remained uncertain for a very long time. The only point of total agreement seems to be that the New Zealand wrens are the surviving representatives of an ancient lineage of passerines, and that they have no close living relatives. This is the view that was expressed in 1990 by Sibley and J. E. Ahlquist, who stated that the Acanthisittidae are not oscines and who placed them, therefore, in the suborder Tyranni, representing all the suboscines. These authors, however, also mentioned the possibility that the New Zealand wrens should be assigned to a new, monotypic suborder. Very recent molecular-genetic research on the Passeriformes, undertaken by F. K. Barker and co-workers, appears to support that possibility indicating that *Acanthisitta* is the sister to all other passerine birds. In view of all this evidence, herein they have been awarded their own separate suborder, provisionally placed between the suboscines and oscines, roughly in the position where most workers would expect to find them.

In the past, the diversity of the Acanthisittidae was greater than is suggested by the number of its living species. The earlier existence of taxa which have since become extinct shows that the family had radiated into a group of at least seven species, probably after the "Oligocene bottleneck", a time when high sea-levels reduced the land area of New Zealand to about 18% of its present extent. According to current understanding, there are five genera: *Acanthisitta*, *Xenicus*, *Traversia*, *Pachyplichas* and *Dendroscansor*. The last three of these are extinct.

Of the extant genera, one, *Acanthisitta*, contains a single species, the Rifleman. *Xenicus* has just two species, the Bush Wren, which is now almost certainly extinct (see Status and Conservation), and the Near-threatened Rock Wren (*Xenicus gilviventris*). The latter is probably an alpine derivative of the Bush Wren. It has been suggested that the common ancestor of the two species was widely distributed in the forest that covered large areas of New Zealand during much of the Tertiary. The ancestor probably diverged in the early Pleistocene, after the Manawatu Strait divided New Zealand into two major islands. Glacial conditions led the southern population to adapt to a cool climate and an absence of forest. A post-Pleistocene invasion of the southern area by the northern form gave rise to the three subspecies of the Bush Wren that inhabited, respectively, North Island, South Island and Stewart Island, with gene flow being interrupted by new water barriers between the islands in the form of the Cook and Foveaux Straits. Meanwhile, the original, cold-adapted southern form retreated to subalpine habitats at higher elevations, giving rise to the Rock Wren.

Of the three extinct genera, *Traversia* (sometimes merged into *Xenicus*) is represented by the flightless Stephens Wren (*Traversia lyalli*). This species died out soon after its discovery, in 1894, on the tiny Stephens Island, in Cook Strait, between the two main New Zealand islands (see illustration and account in Foreword to Volume 7, pages 45-46). Holocene fossil bones of this species have been found at several sites on both North and

South Islands, demonstrating that the Stephens Island population was a relict of a formerly widespread species.

Three acanthisittid species have been described from fossil bones recovered from Late Pleistocene and Holocene caves and sand-dune deposits. These probably died out following the Maori settlement of New Zealand, which took place in about the year 1250. Two of these extinct species, both described in 1988, by P. R. Millener, were united in the genus *Pachyplichas*; these are the North Island Stout-legged Wren (*Pachyplichas jagmi*) and the slightly larger South Island Stout-legged Wren (*Pachyplichas yaldwyni*). The third, described by Millener and T. H. Worthy in 1991 and representing the last of the three extinct genera, is the Long-billed Wren (*Dendroscansor decurvirostris*), the bones of which have so far been found only in the South Island. This is the only New Zealand wren having a significantly curved beak, and its reduced sternum and wing bones indicate that it was flightless (see Morphological Aspects).

Morphological Aspects

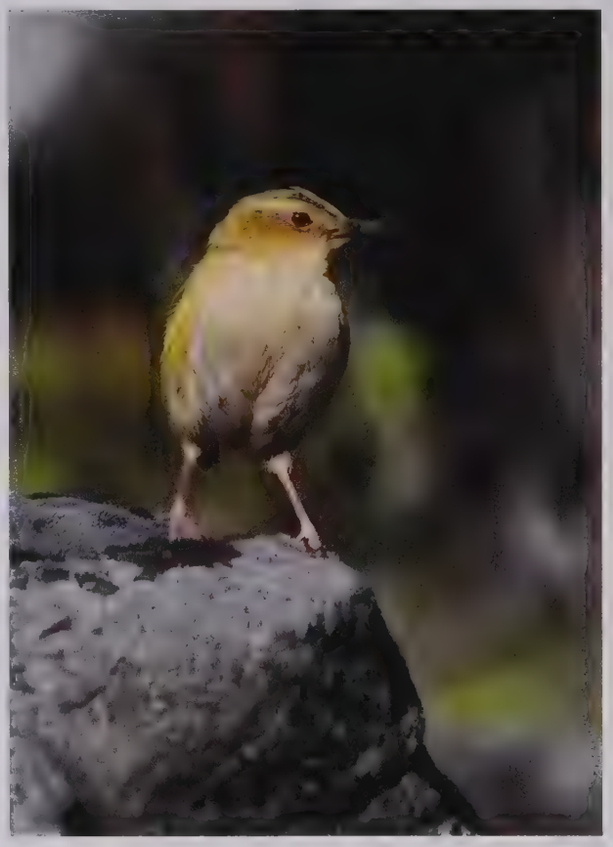
The Acanthisittidae are tiny birds, with a total body length ranging from no more than 7 cm to 10 cm. The diminutive Rifleman is the smallest extant member of the family, weighing as little as 5·5-7 g, with females about 20% heavier than males. Rock Wrens weigh 14-22 g, with an average of about 16 g for males; these figures are probably applicable also to the Bush Wren. The South Island Stout-legged Wren was the largest and most robust of the New Zealand wrens, with an estimated weight of about 50 g. The Long-billed Wren probably weighed about 30 g.

All of the New Zealand wrens for which the plumage coloration is known are predominantly dull green or brown, and all except the Stephens Wren have a prominent pale supercilium. All have short, rounded wings, a greatly reduced tail, and long legs and toes. The bill of the Rifleman is slightly upturned, whereas that of the Rock, Bush and Stephens Wrens is slightly decurved.

Riflemen are markedly sexually dimorphic in plumage. In contrast, Rock Wrens are only slightly so, and the sexes of the Bush Wren are, or were, apparently alike in plumage. In the case of the first two species, the females are rather larger than the males. This is unusual among passerines which show sexual size dimorphism, as the male is usually the heavier in such cases. One study indicated that male and female Riflemen forage together during the non-breeding period, but separately when they are feeding fledglings, at which time energy demands are at their highest. It may be that each sex, by foraging individually, can maximize its feeding efficiency as dictated by the slight morphological differences, which include a longer and more decurved bill and a larger hind claw in the female. The same study also suggested that the green of the male Rifleman may confer good camouflage, given that males with fledglings forage more from foliage than from trunks. Similarly, females favour trunks while foraging alone, and the browner plumage may make them more cryptic at such times.

Adults undergo an annual post-breeding moult that is apparently complete. In the Rifleman, the process lasts 50-60 days, beginning in the last third of January and being completed by April. The primaries are moulted from the inner ones outwards. The adult Rock Wren's moult seems to be of shorter duration, lasting for between five and eight weeks. Little is known about the moult of the juveniles, but it is probable that their first moult is partial, with the flight-feathers and the rectrices being retained.

In the absence of mammalian predators, the first of which reached New Zealand with the Maoris in about 1250, New Zealand wrens were evolving in the direction of flightlessness. Indeed, the Stephens Wren was already flightless, as indicated by its small, rounded wings supported by a reduced wing skeleton, its virtually keel-less sternum, and its somewhat degenerate plumage resembling that of a rail (Rallidae). The only human who described having seen these wrens alive did not report them as flying. The dimensions and proportions of fossil bones of the extinct South Island Stout-legged Wren, North Island Stout-legged Wren and Long-billed Wren suggest that they, too, were flightless. These four species, and an extinct fossil bunting (*Emberiza*) from the Canary Islands, appear to be the world's only flightless passerines.



*The **Rock Wren** is mainly terrestrial. It lives in a harsh upland environment of rocky scree, boulders and low shrubs. It usually forages in pairs, and never joins mixed-species flocks, partly because it is one of the few species that occur in this habitat. It is predominantly insectivorous, catching its prey in low vegetation, in crevices between rocks, or on boulders. In colder months, the diet is supplemented with seeds and berries. However, it is not yet clear whether this species can survive the winter at high altitudes, perhaps by falling torpid when temperatures are low.*

[*Xenicus gilviventris*, South Island, New Zealand. Photo: Don Hadden/ Ardea]

The Rock Wren's long legs are set back on the body, a placement which, combined with the long toes and claws, facilitates the behaviour of scrambling and perching on rocky projections. In the two stout-legged wrens, the relatively reduced wings were countered by robust legs, suggesting that both species spent much time on the ground. The end toe bones are flat, like those of a ground-dwelling bird, rather than curved, like those of a perching bird. As its name suggests, the Long-billed Wren had a long, downcurved bill, as well as relatively short, thin legs, and enlarged anterior neck vertebrae. These skeletal features suggest that it may have behaved in a manner similar to that of the Australasian treecreepers (Climacteridae), moving up and down tree trunks and branches, and over fallen logs, while probing in crevices for food.

Habitat

Apart from the Rock Wren, which is adapted to more open alpine areas, the New Zealand wrens are essentially forest birds. The Rifleman is found in the larger remaining tracts of forest. It is most abundant in southern beech (*Nothofagus*) forest, which covers much of the mountain chain in both main islands and the dry eastern foothills of the South Island, and is less numerous in the mixed podocarp-broadleaf forest that is typical of lower altitudes throughout much of the country. In a study in lowland rimu (*Dacrydium*) forest, it was found that Riflemen prefer to forage in middle and low tiers of the forest, and that they use pole rimu trees, as opposed to mature ones, more than would be expected from the relative abundance of pole trees. In some areas, Riflemen exploit scrub, such as that consisting of the myrtaceous species *Leptospermum* and *Kunzea*, and have adapted to using mature plantations of exotic pines, mainly of *Pinus radiata*. They are occasionally seen in hedgerows, gardens and parks where these adjoin native forest or scrub.

The Bush Wren was found in similar habitats to those occupied by the Rifleman. It lived in beech forest and podocarp-broadleaf forest, mostly at high altitudes, but also occurred in coastal forest and scrub.

The Rock Wren and a large, noisy parrot, the Kea (*Nestor notabilis*), share the distinction of being the only New Zealand high-mountain birds specialized for life in open, rocky alpine



*The **Rifleman** does not invest all its foraging time on tree trunks. It sometimes feeds in the lower canopy or in adjacent shrubs, and it is fond of clinging to the epiphytic vegetation that grows so readily in the humid forests of New Zealand. Here it picks about for insects in the moss, and often enters nooks looking for insect larvae or spiders. The Rifleman is noticeably sexually dimorphic. There is even a theory that this relates to a segregation of foraging niches during the breeding period. Apparently, the green-backed males tend to forage more in leafy or mossy situations, where they are camouflaged, while the brown females forage more on bark.*

[*Acanthisitta chloris chloris*, South Island, New Zealand. Photo: Don Hadden/ Ardea]

and subalpine habitats with herb fields and stunted ground-hugging vegetation. These habitats developed after the onset of the Pleistocene ice ages. In some areas, Rock Wrens live at lower altitudes, in scrub below the bush-line.

Holocene fossil bones of the Stephens Wren have been found at both lowland and high-country sites, implying wide habitat preferences. Similarly, there is evidence that South Island Stout-legged Wrens occurred both in lowland podocarp-broadleaf forest and in subalpine scrub.

As the members of this family appear to be more or less entirely sedentary, they feed, roost and breed in one and the same habitat, throughout the year.

General Habits

The New Zealand wrens are diurnal. The two or three surviving members of the family are all weak fliers. The Rifleman is largely arboreal, and tends to remain close to trees and shrubs. Its flight is short and direct, usually from bush to bush, and often on a descending course. It seldom flies across open ground. Rock Wrens are equally poorly adapted for flight. They rarely cover distances of more than 30 m in a single flight, and rarely fly more than 2-3 m above the terrain.

Since the nominate race of the Bush Wren, which lived on the South Island, was never studied in detail, very little information is available on its general behaviour. For example, it is not known whether it was arboreal in tall forests of that island, or whether it was more terrestrial than the Rifleman. Details of the Bush Wren's life history were, however, recorded on islets near Stewart Island, where the forest in which the subspecies *variabilis* lived was low and the birds spent much time on the forest floor.

The Rock Wren is largely terrestrial, and the Stephens Wren was said to live among rocks and to run about like a mouse. Both the latter species and the three extinct acanthisittids known from Holocene fossils (see Systematics) must have been ground-dwellers to a large degree, since they were all flightless. Nevertheless, they were probably capable to some extent of climbing into trees and shrubs in order to forage among the branches and foliage.

Riflemen move restlessly through the forest and scrub, from tree to tree, seldom remaining in one spot for more than a few seconds. The Rock Wren moves about mainly by hopping, and has a characteristic bobbing action as it pauses between bursts of movement. It never steps or runs but, instead, it progresses across the ground with a bouncing gait, with the feet moving together. This method of locomotion is aided by the broad span of the foot. Both species flick their wings during non-volant locomotion. Rock Wrens also display a bowing movement, which involves leaning forward momentarily.

Bush Wrens were probably similar to Rock Wrens in their locomotion, and they shared the habit of vigorously bobbing the whole body upon alighting.

The territories and pair-bonds of the New Zealand wrens are almost invariably permanent. Adult Riflemen tend to remain in their small home ranges throughout the year. Because pairs occupy exclusive home ranges during the breeding season, they are regarded as territorial, although they do not sing, and territorial fighting or displays are rare. If one partner dies, the other either moves a short distance and sets up a new territory or, perhaps more often, simply waits for a new mate to arrive in its existing territory. From the limited data available, the size of the territory is rather variable. At Dunedin, for example, two territories were about 1·6-2 ha in extent, one of these contracting during the breeding season to 0·8-1·2 ha. In the North Island, however, the average size of territories in the Orongorongo Valley was 6·25 ha in the breeding season and 3·6 ha during the rest of the year.

Similarly, Rock Wrens usually remain paired throughout the year, living in what are said to be territories. These vary greatly in size, the extent being dependent to a large degree on the amount of vegetation present. Smaller territories, those up to about 2 ha in size, contain a very high percentage of vegetation cover, as much as 80%, whereas territories in areas where vegetation is much sparser can extend to 10 ha or more. Territorial disputes between adults are ritualized, with much calling and bobbing from a distance, but little physical contact.

During the incubation and brooding periods, female New Zealand wrens roost in the nest (see Breeding). At other times, both sexes of the Rock Wren sleep at night in a deep hole under rocks, and each pair appears to have several cavities that are used for this purpose. Interestingly, the birds often carry pieces of grass into the roosting hole and construct a special platform on which to rest. They may also retreat to such roost-holes in the daytime in order to avoid strong winds and driving rain. During such adverse weather conditions, they will also seek shelter on protected ledges or against rock faces, where they perch with the plumage ruffled. Riflemen roost either in a sheltered situation in the canopy of a tree, such as a kanuka (*Kunzea ericoides*), or in a suitable cavity in the nesting tree. Here, the birds sit very close together, in physical contact with each other, in order not to lose body heat.

Rock Wrens preen frequently during the day. In addition, the females indulge in regular bathing after egg-laying, when they often stand in a suitable spot in a flowing stream and allow water to shower over them from a small overhang. They also utilize any available puddles which have formed, as, for instance, on the surfaces of large rocks. By contrast, the Rifleman uses wet foliage and dew-sodden grass in which to bathe, primarily during the morning hours. It also performs sunning at times, spreading its wings and fluffing up the body feathers to allow the sun's rays to penetrate. So far as is known, neither species has been recorded as dust-bathing.

Of particular interest is the behaviour of the Rock Wren in its alpine environment during the winter months. In the high-lying rocky habitats in which it lives, the weather at this time of the year can be severe, with prolonged periods of extensive snow cover. One would perhaps expect the birds to descend to lower elevations in order to avoid the harsh and difficult conditions, but this seems not to be the case. During surveys carried out at Lake Harris Basin, from May 1976 to April 1977, the species was recorded only in October and in the months from December to March. Despite intensive searching, no Rock Wrens were seen during May-September and in November, when deep snow covered that subalpine region, nor was any found in April. Somewhat surprisingly, perhaps, the species was not reported from lower elevations, either, and to date there appears to be no evidence that it ever moves down into the tree-line region in adverse weather. If

the Rock Wren does, as seems to be the case, remain in its high-altitude habitat throughout the year, then how does it manage to survive in the severe winter climate? It has been speculated that the birds enter hibernation, and some authors have suggested that they may, at least at night, become torpid or semi-torpid. It is worth noting here that there is a growing list of Australian bird species, including insectivorous passerines, that are now known or suspected to enter a state of torpor as a means of conserving energy, a phenomenon already well documented also for the hummingbirds (Trochilidae) of the Neotropical Region. An alternative possibility, put forward by several other authors, is that the Rock Wrens remain active beneath the snow, where they feed in the pockets of air between the boulders and the shrubs. This is an attractive theory but, despite some statements in the literature, it has not been proven to be true. Indeed, the species' strategy for survival during the hardest months of the year remains unknown.

Voice

The Rifleman and the Rock Wren each have a limited repertoire of simple, short calls and trills. Those of the Rifleman are generally less musical and more rapidly repeated. The calls are very high-pitched, and have been measured at 7-15 kHz for the Rifleman and 8-16 kHz for the Rock Wren. High-pitched calls may carry well under favourable conditions in an alpine environment. In forest and scrub, on the other hand, the Rifleman's voice is usually audible to humans only at very close quarters, and many older people cannot hear the calls at all.

There is no special song as such, but pair-members and members of family groups utter frequent contact calls during foraging. The Rifleman's commonest vocalization is a short, repeated single-note call, transcribed as "zipt", "ssip" or "zee", given constantly by members of a pair while foraging. The Rock Wren's main vocalization is a thin, high-pitched three-note call, "tzee-tzit-tzit", or a short single-note "zipt". Paired individuals, of both species, are said to use antiphonal calling. Both sexes of the Rock Wren appear to give the full repertoire of calls, and the same seems to be true of the Rifleman's main calls.

Little is known of the voice of the probably extinct Bush Wren. A few anecdotal accounts suggest that it had calls that were more powerful than the Rifleman's, but they are still described as faint or subdued.

Food and Feeding

All of the Acanthisittidae are, or are assumed to have been, predominantly insectivorous. Riflemen glean invertebrates from crevices in the bark of trunks and branches, from twigs and leaves of trees and shrubs, and from the epiphytic plants that abound in New Zealand forest. They forage in the manner of treecreepers, moving up and around tree trunks in a spiralling pattern before flying to a low point on another trunk, there beginning another spiralling ascent. They explore fallen logs for food, even entering hollow logs and the cavities between tree roots, but they spend little time on the ground. They can cling upside-down while foraging on the undersides of branches. The principal foods of the Rifleman are small arthropods, especially beetles (Coleoptera), wingless crickets (Orthoptera), spiders, flies (Diptera), moths and caterpillars, and plant-bugs (Hemiptera); small snails and small fruits are occasionally consumed. The species kills arthropod prey by striking them against a firm surface.

Outside the breeding season, Riflemen usually forage in pairs or, more rarely, alone or in family groups of up to eight individuals. Occasionally they join mixed feeding flocks, accompanying such species as Silver-eyes (*Zosterops lateralis*) and Yellowheads (*Mohoua ochrocephala*). A study during the autumn and winter at a site in the South Island showed that, in both seasons, Riflemen foraged for about 80% of the daytime period.

Rock Wrens eat insects, including springtails (Collembola), as well as arachnids and oligochaetes, which they glean from low shrubby or herb-field vegetation, and from crevices between boulders and stones. They use the feet to pry apart vegetation or to grip flexible shoots. They readily enter interstitial spaces while foraging, and at times they disappear down holes for several minutes, and may be heard calling while out of sight. In the winter, when snow covers areas of rocks or scrub, Rock Wrens may be able to move about in gaps and crevices beneath the snow (see General Habits). As well as gleaning prey, this species occasionally catches flying or jumping insects by making aerial sallies, especially in warm weather. Large prey, such as grasshoppers, may be beaten against a hard surface before being swallowed, if necessary after first being dismembered. Interestingly, this acanthisittid has been observed to cache insect food, such as moths, for short periods.

In addition, Rock Wrens supplement their primary diet with seeds and berries of alpine plants, particularly during cooler months, and in some regions they have been seen to drink nectar from the flowers of New Zealand flax (*Phormium*).

Like the Rifleman, the Rock Wren generally forages in pairs. It sometimes feeds in small parties of up to six or eight individuals, presumably family groups, but appears rarely to forage alone. It has not been observed to join mixed-species flocks, but these are less likely to form in the open, subalpine regions which it inhabits.

The Bush Wren is thought to have gleaned food mostly from foliage, and to have been less adept than the Rifleman at exploiting bark crevices on trunks and branches. On islets off Stewart Island, Bush Wrens moved quickly and furtively, feeding on or close to the forest floor. Their known foods were moths, flies and spiders.

Breeding

Detailed information on breeding is available only for the two definitely surviving species of the Acanthisittidae, and there are limited data on the Bush Wren. All three species build bulky enclosed nests in cavities, with access by a side entrance, and lay 2-5 white eggs. In the case of the Rifleman and the Rock Wren, both sexes build the nest, incubate the eggs and feed the young, and the male often feeds the female, especially during egg-laying. The incubation and fledging periods are long. Both sexes of the Bush Wren incubated the eggs and fed the young.

Riflemen are monogamous, and form long-term pair-bonds that endure for several years. They have a protracted breeding season spanning the months of August to January, thus lasting from late winter to late summer. During this period they usually rear two broods of young. Riflemen breed in their first year of life, from the age of nine months. They begin to nest in late winter or early spring, and may build several nests that they never complete. The laying of second clutches begins in early November. They usually nest in holes in the branches or trunks of dead or living trees, or in stumps or logs. Less typical sites are cavities in or on the ground, such as a disused rabbit burrow or the empty skull of a horse, and holes in fence posts and in the walls of wooden huts. They also use artifical nestboxes. The nest itself, which is ovoid or dome-shaped and has a short entrance tunnel 2-3 cm wide, is constructed from twigs, lichen, grass, moss, leaf skeletons and fern roots. The tightly woven nest wall is especially thick early in the breeding season, the purpose presumably being to maximize thermal insulation. The nest-cavity is lined with feathers.

The eggs of this species are laid at intervals of 48 hours, rather than 24 hours. They are relatively large, measuring about 16 × 13 mm, and weigh 1·3 g each, approximately a fifth of the female's body weight. They are incubated for 19-21 days. When an incubating parent leaves the nest, it covers the eggs and blocks the entrance with feathers, an action which helps to prevent heat loss.

In a population of Riflemen studied by G. H. Sherley at Kaikoura, in the north-east of the South Island, courtship-feeding of the female by the male during the egg-laying period represented a major element of her food intake early in the season, but this was not the case with later clutches. This degree of mate-feeding probably allows breeding to begin earlier than would otherwise be possible. First clutches contained an average of 4·4 eggs, compared with 3·8 eggs for second clutches, and the mean incubation period was 19·7 days. The male makes a greater



*The **Rifleman** builds a bulky domed nest in cavities in the branches or trunks of dead or living trees, or in stumps or logs. The nest itself has a short entrance tunnel and is entirely constructed of twigs, lichen, grass, moss, dead leaves and fern roots. Both sexes share the tasks of nest construction and provisioning of young. This photograph shows a female carrying food at the nest entrance, but it is actually the male that provides most items during the 24-day fledging period. This species is essentially monogamous, but a small proportion of the population breeds co-operatively with helpers at the nest.*

[*Acanthisitta chloris*, New Zealand. Photo: M. F. Soper/ ANT/NHPA]

contribution to incubation during the daytime, by sitting for longer periods, than does the female. The female incubates overnight, maintaining the air temperature between the eggs at a level 12-15°C higher than that outside the nest. Males roost away from the nest.

The nestling period of the Rifleman is about 24 days, during which time the chicks grow slowly. On fledging, they are considerably heavier than the adults. After having left the nest, the young remain dependent on the parents for a further 4-6 weeks, and may stay with them in a family group during the non-breeding season. Most juveniles, however, disperse and set up their own territories by the start of winter.

The breeding system of the Rifleman has been studied in some detail at Kaikoura, and with some interesting findings. In the 1980s, a population was colour-ringed and its breeding behaviour observed. It was discovered that some Riflemen nested as simple pairs, whereas others bred co-operatively. Extra adults and juveniles had been reported as attending nests of this species in the 1960s, but this was wrongly interpreted as polygamy. At Kaikoura, observations revealed that such extra birds were, in fact, helpers, and they were present at nests of both first broods and second broods. Those attending first-brood nests were usually unpaired adult males, and these sometimes acquired a mate from the brood which they helped to rear. At second broods, they were more often juveniles from the first brood. The effect of helpers was to reduce the workload of the parental male, which otherwise provides most of the food for the young. Helpers not only fed the nestlings, but also removed faecal sacs and defended the chicks. Even so, they were not allowed by the breeding pair to approach the chicks until the latter were about five days old.

Two types of helper were identified. Those which attended a single nest and contributed a significant amount of the chicks' food, on a daily basis, were regarded as "regular" helpers. These were generally unpaired adult males, at first-brood nests. Individuals which made a lesser contribution to the nesting attempt, visiting less frequently and sometimes not even daily, were categorized as "casual" helpers. The majority of these were first-brood offspring attending their parents' second brood, although some unmated adult males also come into this category. In addition, many casual helpers attend more than one nest. Both types of helper can be present at a single nest, and both continue to feed the young after they fledge.

In the study at Kaikoura, 83 first-brood nests of Riflemen were observed. Helpers were present at 28% of these, over half of which had regular helpers. Of the 50 second broods studied, just over half were attended by helpers, the greater percentage of which were casual. It is worth noting that instances of co-operative breeding are unusual among passerines on a worldwide scale, but are more common among the passerines of the Australasian Region.

Like the Rifleman, the Rock Wren forms monogamous pair-bonds. Unlike that species, however, it has not been observed to breed co-operatively. The members of the pair work closely together to take advantage of the short breeding season that is afforded by the high-altitude climate in which they live. Nest-building commences in mid-September, and the last young leave the nest in early January. In the short breeding season, lasting for less than four months, the pair has time to raise only one brood. With nesting attempts made in the early part of the season, however, a replacement clutch is often laid if the first one fails. An interesting point of difference between the two species

is that not only does the male Rock Wren courtship-feed his mate, but the female also sometimes feeds the male.

The Rock Wren's bulky nest is usually placed in a crevice between rocks, among sturdy roots, or deep in soft clay or mud banks or layers of soft moss. Pairs will excavate nest-holes 10-15 cm deep, removing soil by pecking with the beak and scraping with the feet. The nest, in a chamber at the end of a short tunnel, is spherical or cigar-shaped, with an entrance at the end or the side. The nest walls can be 6-8 cm thick, providing good insulation. Rock Wrens lay clutches of 2-5 eggs, with three being the mode, and, as with the Rifleman, the laying interval is two days. These are incubated for a relatively long period, covering 18-22 days. The young remain in the nest for 21-26 days. As soon as they leave it, they are able to provide almost half of their own food requirements, and within one month they are totally independent.

As both the Rifleman and the Rock Wren are monogamous, forming permanent pair-bonds, and as individuals usually spend their entire lives within a single restricted area, they have little need for any complex breeding displays. As the egg-laying period approaches, the male Rifleman normally spends most of his time in close proximity to his mate, perhaps as a means of preventing extra-pair copulations. On the other hand, there are several observations of a male, during the laying period, leaving his partner's side and moving away, even when a neighbouring male was very close by. Further, although breeding adults are often aggressive towards helpers in the early stages, they soon accept the presence of these additional birds. In the case of the Rock Wren, the female, which selects the nest-site, performs bobbing and wing-flicking movements as she presents nest material to her mate. She continues to demonstrate her chosen site by wing-spreading and wing-vibrating, with much calling.

Very little is known about the breeding biology of the Bush Wren. From the few data available, it appears that this species nested in November and December. The nominate race, which inhabited the South Island, usually nested in a hole in a tree trunk or branch, in the fork of a double trunk, or among the roots of a fallen tree. The Stewart Island subspecies, *variabilis*, which occurred also on smaller islands to the south-west, often nested low down; its nests were located in holes in the ground, on fallen logs or in clumps of ground-ferns. The few clutches found consisted of two eggs; some statements in the literature refer to occasional clutches of three eggs, but it seems that such claims have never been substantiated. Nests with eggs were found on Solomon Island, off Stewart Island, in November and December. Although it is known that the two sexes of the Bush Wren shared incubation and brood-feeding duties, the incubation and nestling periods of the species were never determined.

Movements

New Zealand's endemic passerines, once they attain breeding age, are mostly sedentary throughout the year. They engage in little or no latitudinal or altitudinal movements in relation to the seasons. In line with this, colour-ringing studies of Riflemen in the north-east region of the South Island, at Kaikoura, revealed that the species remained on its territories in all months of the year. In a 21-ha study plot, however, there was some evidence, from seasonal changes in population density, that a small number of individuals possibly undertook local movements into or out of the study area. At another locality, in the north-west of the South Island, counts made at different times of the year indicated the possibility that some Riflemen descended to lower altitudes in September, in order to breed. A similar possibility was suggested by observations on Stewart Island. Whether or not this species does perform short, seasonal altitudinal movements, however, remains open to question.

Rock Wrens living in subalpine habitats are thought to remain there in all seasons, including the austral winter. So far as is known, there are no records of the species at lower elevations during the non-breeding season, even when weather conditions at higher levels are very harsh. It has been suggested that, after heavy snowfall, Rock Wrens survive by remaining active in the air spaces between the buried rocks and plants, or by entering a state of torpor for short periods (see General Habits). Although one or other, or even both, of these theories may be correct, there appears as yet to be no firm evidence for either of them.

Juveniles appear to disperse only short distances. Studies of Riflemen indicate that the young usually move from the natal territory to the nearest suitable area of forest. In one case, five subadults crossed 300 m or more of pastureland containing small patches of remnant forest. At two study sites, one of 12 ha and the other of about 80 ha, seven immature Riflemen dispersed outside the boundaries of the respective sites.

Relationship with Man

Riflemen are much-loved among birdwatchers for their diminutive size. They are the smallest New Zealand birds. In turn, the species' smallness, drabness, quietness, and confinement to forest and scrub mean that it is not widely known to the general public. Nevertheless, there are several reports of Riflemen visiting campsites and becoming quite tame, even picking up food scraps and taking grease and fat from pans and plates.

The Maori name for the Rifleman, *Titipounamu*, refers to its dark green coloration, *pounamu* being the name for the beautiful jade-like nephrite that the Maoris fashioned into clubs and ornaments. Similarly, the species' English vernacular name is believed by some authors to have possibly arisen from the similarity of the male's green plumage to the greenish colour of the tunics worn by the New Zealand First Infantry Regiment. An alternative theory is that its high-pitched, piercing calls reminded people of the sound of whistling bullets.

There appears to be no widely used Maori name for the Rock Wren, presumably because the original Maori settlers spent little time in the cool subalpine areas where the bird lives. For the same reason, few contemporary New Zealanders have ever seen this bird. Nevertheless, the species has had some influence on human thinking in the South Island, where Zit Creek and Zit Saddle, both in Westland, are named after the Rock Wren's "zipt" call.

On the South Island, the Bush Wren was called *Matuhi* by the Maoris, and there is a Maori saying that, if you kill this bird, snow will fall.

Status and Conservation

Of the seven species of New Zealand wren, three are known only from Holocene fossil bones (see Systematics). They appear to have become extinct during the period between Maori and European settlements of New Zealand, in the years between about 1250 and 1769, as a result of the ecological disruption caused by the earlier colonists. In particular, habitat clearance and the introduction of a species of south-east Asian rat, *Rattus exulans*, would have had a devastating effect on the wildlife of the islands.

Since European settlement, a period which has seen massive deforestation, the draining of swamps and the introduction of further predatory mammals, the Stephens Wren too has died out, as almost certainly has the Bush Wren. The Stephens Wren appears to have been both discovered and, soon thereafter, eliminated by a pet cat. The interval between its initial discovery and its extinction is probably the shortest for any animal species. Late in 1894, one of the Stephens Island lighthouse-keepers, D. Lyall, retrieved from the cat about 17 specimens of the wren, a dozen of which are still available in museum collections. Lyall twice saw the bird alive, and was seemingly the only European ever to have done so. It should be noted, however, that some regard this as an apocryphal tale, suggesting that deliberate collecting for museums was a major factor in the bird's demise.

The Bush Wren once occurred throughout New Zealand. The North Island subspecies, *stokesii*, was so rare in historical times that it is represented in museums by only three specimens, two collected in the Rimutaka Range, near Wellington, in about 1850 and one from Taupo, in the central part of the North Island. Subfossil bones reveal that it was formerly more widely distributed in the North Island, so that it was presumably already in



Three flightless species of New Zealand wren presumably died out some time after Maori settlement, whereas the Stephens Wren (Traversia lyalli) *and the Bush Wren* (Xenicus longipes) *were still extant in the early days of the European colonization. They were apparently driven to extinction by introduced predators, the last probable Bush Wren sighting being in 1968. Of the two definitely surviving species, the* ***Rock Wren*** *is considered Near-threatened. In this case, too, the main threat is posed by introduced predators, particularly the stoat* (Mustela erminea).

[*Xenicus gilviventris*, Homer Saddle, Fiordland National Park, South Island, New Zealand. Photo: Geoff Moon/FLPA]

decline as a result of Maori settlement. Two individuals were seen near Wellington in 1918, and the last reasonably reliable sightings were made near Lake Waikaremoana, in the eastern part of the island, in 1949 and 1955. The South Island race of the Bush Wren was widespread, especially in mountain forest, at the time when Europeans first arrived in New Zealand. Before long, however, the effects of this colonization must have begun to reduce the wren's population, and throughout the nineteenth century this subspecies almost certainly declined in all parts of its range. The last probable sightings in the South Island were in Southland, in 1947, and in the Nelson Lakes National Park, in the northern region, in 1968.

Slightly more isolated in the south, on Stewart Island and its associated satellites, the subspecies *variabilis* survived for a little longer. This race, sometimes referred to as "Stead's Bush Wren", was studied in the 1930s on islands off the south-west coast of Stewart Island. There were possible sightings of Bush Wrens on Stewart Island itself in 1950 and 1951, but by the 1960s the species had become confined to just one islet with the name of Big South Cape Island. Tragically, an invasion of black rats (*Rattus rattus*) began on Big South Cape in 1962, the rats having apparently reached the island by climbing along the mooring lines of fishing boats. As the rat's numbers increased, the island's wildlife declined rapidly. Before the wrens disappeared, in 1965, the New Zealand Wildlife Service, the forerunner of the present-day Department of Conservation, transferred six individuals to nearby Kaimohu Island, which was rat-free. Two wrens were seen on Kaimohu in 1972, but an inspection in 1977, and subsequent visits by ornithologists, revealed none. The Bush Wren has now "officially" been listed as extinct by BirdLife International, so, sadly, hope of its rediscovery must realistically be abandoned.

The demise of the Bush Wren represents the most recent extinction among New Zealand birds. The magnitude of the ecological disaster on Big South Cape Island was not fully appreciated at the time. Along with the Bush Wren were lost the last populations of the Stewart Island subspecies *iredalei* of the Subantarctic Snipe (*Coenocorypha aucklandica*) and of a species of mammal, the greater short-tailed bat (*Mystacina robusta*).

So far as the two surviving members of the Acanthisittidae are concerned, the Rock Wren is currently considered to be Near-threatened, while the Rifleman is not believed to be at any risk. The Rock Wren's preference for high altitudes means that it has suffered relatively little from habitat clearance, and predation by introduced mammals may also be less intense in subalpine areas than at lower altitudes. Nevertheless, introduced mammalian predators remain the principal threat to the species, which is rendered vulnerable by its largely terrestrial habits and weak flight (see General Habits) and by the fact that it nests in cavities in or near the ground (see Breeding). In particular, the stoat (*Mustela erminea*) is known to kill and eat Rock Wrens, and even house mice (*Mus musculus*) have been reported as killing the birds. There are no estimates of the current population of the Rock Wren. Although it is reported as being relatively common in some areas, it may have declined in others. Latest reports suggest a major decline at a site in the north-west of its range as a result of predation by stoats.

The best-known member of the family is the Rifleman. This species is fairly widespread in native forest habitats in both of New Zealand's main islands, and it has been frequently reported from the northern part of Stewart Island. In the late 1800s and early 1900s, its range contracted wherever lowland forest and scrub were cleared. Since then, however, its spread into exotic pine (*Pinus*) forests is welcome evidence of a degree of adaptability to man-modified habitats. The Rifleman remains reasonably common. Recorded densities of this species include, for example, 9-15 breeding pairs in 6 ha of forest and ten individuals in just 1 ha. The only potential threats come from the removal of native forest for agriculture, or the replacement of such forest by commercial plantations of exotic trees, and from predation by introduced mammals. Fortunately, the conversion of native forest to exotics is no longer permitted on government land, and this damaging activity is therefore far less widespread than it once was.

General Bibliography

Ames (1971), Baker (1991), Barker *et al.* (2001), Bock (1994), Bull (1981), Bull *et al.* (1985), Buller (1888, 1905), Clench (1992), Cooper (1994), Cooper & Cooper (1995), Cracraft (1981, 2001), Edwards & Boles (2002), Ericson, Christidis, Cooper *et al.* (2002), Feduccia (1975), Fitzgerald (1985), Flannery & Schouten (2001), Fleming (1975, 1982), Forbes (1882), Galbreath (1989), Gill & Martinson (1991), Grant-Mackie & Grant-Mackie (1994), Higgins *et al.* (2001), Holdaway (1988), Keast (1972), Medway (1976), Millener (1988, 1989), Millener & Worthy (1991), Oliver (1955), Petyt (2003), Pycraft (1905, 1906), Raikow (1984, 1987), Rands (1991), Schodde (1994), Serventy (1972), Sibley (1970, 1996), Sibley & Ahlquist (1990), Sibley & Monroe (1990), Sibley, Ahlquist & Monroe (1988), Sibley, Williams & Ahlquist (1982), Stead (1936), Tily (1953), Traylor (1979a).



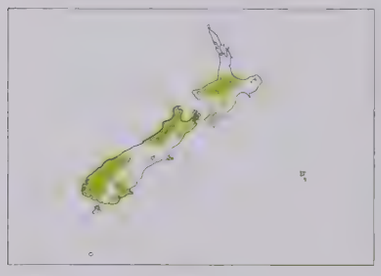
Genus *ACANTHISITTA* Lafresnaye, 1842

1. Rifleman

Acanthisitta chloris

French: Xénique grimpeur **German**: Grünschlupfer **Spanish**: Acantisita Verdoso
Other common names: Alpine Rifleman, Rifleman Wren; North Island Rifleman (*granti*); South Island Rifleman (*chloris*)

Taxonomy. *Sitta chloris* Sparrman, 1787, "Cape of Good Hope"; error = Queen Charlotte Sound, South Island, New Zealand.
Morphological differences between races minor and poorly understood; further study needed. Supposedly larger, more yellowish birds in SW of range (Fiordland) described as race *citrina*, but considered indistinguishable from nominate. Two subspecies recognized.
Subspecies and Distribution.
A. c. granti Mathews & Iredale, 1913 - North I and outliers, New Zealand.
A. c. chloris (Sparrman, 1787) - South I, Stewart I and outliers.



Descriptive notes. 7-9 cm; male c. 6 g, female 7 g. Tiny greenish passerine with short rounded wings, very short tail, pale supercilium, and fine, slightly upturned bill. Male is bright green above, rump yellow-green; folded wing shows patches of green, black and white, with transverse yellow band at base of flight-feathers (pale wingbar obvious in flight); tail dark, tip whitish; chin, breast and belly white, variably washed cream or light yellowish, flanks yellowish; bill dark brown or black, some with yellower gape and base of lower mandible; legs dark brown or yellow-orange, soles yellow. Female is duller than male, green of upperparts replaced by yellow-brown with darker streaks, rump yellow-brown. Juvenile resembles female, but streaked on breast as well as upperparts, supercilium less distinct, some individuals heavily and extensively spotted and streaked. Race *granti* is supposedly less yellow below, including flanks, but variable. Voice. Calls simple, mostly faint, sharp and high-pitched; main call a squeaky repetitive "zipt".
Habitat. Forest, especially beech (*Nothofagus*) forest, and scrub; also pine (*Pinus*) plantations, especially older ones with dense understorey of native shrubs. Sometimes found in remnant patches of native vegetation in otherwise cleared areas; in open areas recorded also in hedgerows, in patches of introduced gorse (*Ulex*) and broom (*Cytisus*), and in roadside vegetation. Occasionally visits gardens and urban parks. Mainly in uplands, to c. 1550 m.
Food and Feeding. Predominantly insectivorous. Diet includes wide variety of small arthropods, especially coleopterans, including weevils (Curculionidae), and wingless crickets (Orthoptera), spiders, flies (Diptera), moths and caterpillars, and plant-bugs (Hemiptera); small snails occasionally consumed, and small berries occasionally eaten. Reported as picking up food scraps around camps. Kills larger arthropod prey by striking them against a firm surface. Forages in pairs or in small groups, rarely singly; occasionally joins mixed-species flocks with e.g. Silver-eyes (*Zosterops lateralis*). Gleans invertebrates from trunks, branches, twigs and leaves, spending little time on ground. Restless forager along trunks and branches; wings constantly flicked. Flight usually short and direct between trees and shrubs.
Breeding. Season Aug-Feb; 2 broods. Monogamous; long-term pair-bond. Often breeds co-operatively, with helpers; helpers at first brood usually unpaired adult males, at second brood usually offspring of first brood. Nest built by both sexes, ovoid or dome-shaped, side entrance with short tunnel, of sticks, grass, leaf skeletons and rootlets, occasionally some moss, dead leaves, wood chips or spider webs, chamber lined with feathers, placed in cavity in tree trunk, branch, fence post or similar site, occasionally in ground; nestbox often used. Clutch 2-5 eggs, laid at intervals of 48 hours; incubation by both sexes, period 19-21 days; chicks fed by both parents, from fifth day also to varying extent by helpers; nestling period 21-27 days, mostly 24-25 days; young independent by 4-6 weeks. In one study of 14 nests, 57·4% of eggs hatched and 48·9% fledged; in another study, mean of 3·9 young fledged at first-brood nests with helpers and 3·7 at those without helpers, corresponding figures for second broods being 3·4 and 3·3; nests sometimes preyed on by mammals, e.g. stoats (*Mustela erminea*). First breeding at 9 months. In study of colour-ringed population, two males lived for 6 years, average longevity of adult males 2 years 2 months, of females 1 year 8 months.
Movements. Resident. Probably sedentary; possibly some short local movement, possibly also a degree of altitudinal movement, but confirmation required. Juveniles disperse short distances.

Status and Conservation. Not globally threatened. Locally common in suitable habitats. Recorded densities include 2·2-3·4 birds/ha and 9-15 breeding pairs in 6 ha. Declines noted in some areas, mainly in North I, in 19th and 20th centuries. Clearance of native forest for agriculture and for planting of exotic trees, especially pines, has adverse effect on populations; conversely, has adapted to pine habitat in some areas. Sometimes killed by stoats and domestic cats, and one observation of an adult caught by Sacred Kingfisher (*Todiramphus sanctus*).

Bibliography. Blackburn (1968), Bull (1981), Bull *et al.* (1985), Caughley & Challies (1960), Chambers (2000), Clout (1980), Dawson *et al.* (1978), Falla *et al.* (1981), Gill (1996), Gray (1969), de Hamel & McLean (1989), Heather & Robertson (1997), Higgins *et al.* (2001), Holdaway (1988), Hunt & McLean (1993), Kinsky (1970), Lill (1991), Moeed & Fitzgerald (1982), Moon (1980, 1992), Moon & Lockley (1982), Pierce (1994), Pycraft (1905), Robertson, C.J.R. (1985), Robertson, H. & Heather (2001), Secker (1958), Sherley (1989, 1990a, 1990b, 1994), Soper (1961b, 1976), St. Paul & McKenzie (1976), Warburton *et al.* (1992), Williams (1975).

Genus *XENICUS* G. R. Gray, 1855

2. Bush Wren

Xenicus longipes

French: Xénique des buissons **German**: Waldschlüpfer **Spanish**: Acantisita de Matorral
Other common names: Green Wren; North Island Bush Wren (*stokesii*); South Island Bush Wren (*longipes*); Stewart Island/Stead's Bush Wren (*variabilis*)

Taxonomy. *Motacilla longipes* J. F. Gmelin, 1789, Dusky Sound, South Island, New Zealand.
Race *stokesii* known only from three museum skins and few sightings. Race that formerly occupied Stewart I uncertain, assumed to be *variabilis*, which described from offshore islets. Three subspecies recognized.

Subspecies and Distribution.
X. l. stokesii G. R. Gray, 1862 - North I, New Zealand.
X. l. longipes (J. F. Gmelin, 1789) - South I.
X. l. variabilis Stead, 1936 - Stewart I and outliers.



Descriptive notes. 9-10 cm; 16 g. Small greenish passerine with rounded wings, very short tail, pale supercilium, long legs and fine bill. Nominate race somewhat variable, has top of head dark brown to olive-brown, with white supercilium; upperparts variably dull olive-brown or greenish, black carpal patch, remiges edged yellowish, tail olive; upper throat whitish, underparts brownish-grey, flanks yellowish; bill brownish-black; legs slaty black, feet pale brown. Sexes alike. Juvenile poorly known, apparently like dull-plumaged adult but with fine pale streaks above, paler underparts. Race *stokesii* is poorly known, apparently more bluish on neck side and chest, bright yellow patch on flanks; *variabilis* is browner than nominate, variable, supercilium duller and less distinct. Voice. Little known; faint trills and rasping calls.

Habitat. Beech (*Nothofagus*) forest, podocarp-broadleaf forest, and coastal forest and scrub. Mostly at high altitudes.

Food and Feeding. Very poorly known; predominantly insectivorous, taking wide variety of small arthropods, mostly coleopterans. Invertebrates gleaned mainly from foliage and branches, also by probing in bark crevices and epiphytes. Often forages on or close to forest floor, searching leaf litter, mosses and lichens; bobs after alighting on ground.

Breeding. Almost unknown. Laying Nov-Dec. Nest a ball of fern leaves and rootlets, lined with feathers, one nest of nominate race pouch-shaped; placed in cavity, often near ground, sometimes in tree fork. Clutch 2 eggs, possibly sometimes 3; incubation and brood-feeding by both sexes, periods not known.

Movements. Sedentary.

Status and Conservation. Almost certainly EXTINCT. Formerly occurred throughout New Zealand, but declined following human settlement and the introduction of terrestrial predators. North I race *stokesii* last seen in 1955, near L Waikaremoana; in historical times was very rare, and only three specimens exist in museum collections. Nominate race in South I was once common, but populations declined rapidly after Europeans arrived; by 1950s had become extremely rare, and last sighting was in Jan 1968, when two individuals were observed in Nelson Lakes National Park, in N of island. Race *variabilis* was common on Stewart I and, especially, its satellite islands in 1930s, but was last recorded on Stewart I in 1950, with a possible sighting in 1951; by 1960s persisted only on offshore islet of Big South Cape I, where still common in 1961, but arrival on island of black rats (*Rattus rattus*) in following year led to rapid reduction in the wren population, with last confirmed record in Aug 1964. Meanwhile, six birds had been translocated from Big South Cape I to nearby Kaimohu I, where no rats were present; two were seen on Kaimohu in 1967 and 1972, but none was found in 1977 or on subsequent visits. The chances that any individuals still survive are exceedingly remote, and in 2000, the species was declared extinct by BirdLife International. The principal reason for its demise was evidently the introduction of alien predators; clearance of native forest may also have had an adverse effect, particularly in the earlier years.

Bibliography. Baker (1991), Buller (1888, 1905), Collar & Andrew (1988), Collar *et al.* (1994), Cresswell (1968), Dawson (1951), Dunckley & Todd (1949), Edgar (1949), Falla *et al.* (1981), Fuller (2000), Greenway (1967), Heather & Robertson (1997), Higgins *et al.* (2001), Holdaway (1988, 1999), King (1978/79), Kinsky (1970), Knox & Walters (1994), Morris & Smith (1988), Oliver (1955), Robertson (1985), Sibson (1982), St. Paul & McKenzie (1977), Stattersfield & Capper (2000), Stead (1936), Stidolph (1926), Tily (1951), Tyler, M.J. (1979), Williams & Given (1981).

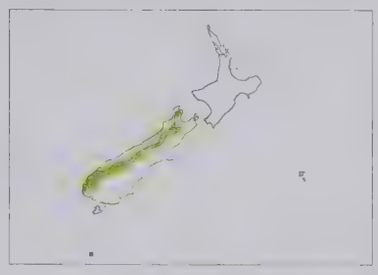
3. Rock Wren

Xenicus gilviventris

French: Xénique des rochers **German**: Felsschlüpfer **Spanish**: Acantisita Roquero
Other common names: South Island Wren; Fiordland Rock Wren ("*rineyi*")

Taxonomy. *Xenicus gilviventris* Pelzeln, 1867, mountains of South Island, New Zealand.
Plumage appears to vary clinally, males becoming brighter from N to S; supposedly smaller, more greenish birds in S (Fiordland) described as race *rineyi*, but now considered only a bright morph. Monotypic.

Distribution. Mountain areas of South I, New Zealand.



Descriptive notes. c. 9·5 cm; male 16 g, female 20 g. Small passerine with rounded wings, very short tail, pale supercilium and fine bill; legs and toes long, feet almost half length of body, claws (especially hind claw) long. Male has head and neck dull olive-brown, white supercilium bordered above and below by narrow black stripes, upperparts and wings olive-green, prominent black patch at bend of folded wing, tail dull olive-brown (head and upperside brighter, greener, in S of range); throat whitish, rest of underparts pale grey-brown to creamy or off-white, flanks yellowish (richer yellow in S); bill blackish-brown; feet pale brown. Female is duller and browner above, often duller below. Juvenile differs from adult in having mostly dark grey bill with orange base of lower mandible, darker legs and feet. Voice. Small repertoire of simple calls, high-pitched and penetrating; main calls a 3-note "tzee-tzit-tzit" and short single "zipt", less frequently repeated than in *Acanthisitta*.

Habitat. Low shrubs, open scree and rockfalls in alpine and subalpine habitats; often in areas with prolonged snow cover. Often near water source, e.g. stream. At 1200-2900 m, usually to 2400 m, i.e. above timber-line; also lower, down to c. 900 m, in subalpine scrub in Fiordland.

Food and Feeding. Predominantly insectivorous. Takes wide variety of small arthropods, e.g. coleopterans, orthopterans, dipterans, springtails (Collembola), spiders, centipedes (Chilopoda), millipedes (Diplopoda), oligochaetes. Occasionally consumes small seeds and berries; also seen to drink nectar from flowers of New Zealand flax (*Phormium*). Large prey may be beaten against a hard surface, and if necessary dismembered, before being swallowed. Observed to cache insect food for short periods. Forages mostly in pairs or in small groups of 4-8 birds, sometimes singly. Terrestrial and arboreal. Hops and runs frequently; flies only short distances, bobs vigorously up and down, often with wing-flicking, on alighting. Gleans items from low vegetation, and from crevices between boulders and stones; readily enters interstitial spaces, and disappears down holes for several minutes; possibly forages beneath snow in austral winter. Occasionally makes aerial sallies after flying or jumping insects. In study in Mt Cook National Park (Fiordland), covering Dec-May, gleaning was commonest technique throughout period; aerial sallying most frequent in Dec-Jan, and most fruit-eating observed in Jan-Mar.

Breeding. Season Sept-Jan. Monogamous; long-term pair-bond. Nest built by both sexes, cigar-shaped or spherical, tiny entrance hole at end or side, mostly of grass with some soft twigs, leaves, bark, fern scales and hair, chamber lined with feathers, sometimes also with soft moss and lichens; placed in cavity in or near ground, e.g. in crevice between rocks, among sturdy roots, or deep in soft clay or mud bank or layer of soft moss. Clutch 2-5 eggs, laid at 2-day intervals; incubation by both sexes, period 18-22 days; both also feed chicks, nestling period 21-26 days; young independent at 2-3 weeks. Of total of 106 eggs in one study, 91 (c. 86%) hatched and 71 (67%) produced fledglings; nests preyed on by stoats (*Mustela erminea*) and house mice (*Mus musculus*).

Movements. Resident. Apparently sedentary; no evidence for suggested movement to lower elevations during severe weather.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in South Island of New Zealand EBA. Has rather fragmented distribution, from NW Nelson S to Fiordland, but uncommon, even in suitable areas. Former presence in North I indicated by Holocene fossil bones. Rare in N of range in Nelson and W Marlborough, but believed to have been more common in the past in Nelson; more widespread and perhaps locally fairly common farther S in Southern Alps. Principal threat is introduced mammalian predators, especially stoat (*Mustela erminea*) but also house mouse (*Mus musculus*); possible that former take a fairly high percentage of nestlings, as well as some adults, and probably many eggs taken by mice.

Bibliography. Baker (1991), Brathwaite (1974), Bull *et al.* (1985), Chambers (2000), Child (1970, 1978), Collar *et al.* (1994), Falla (1953), Falla *et al.* (1981), Fuller (2000), Greenway (1967), Heath (1986), Heather & Robertson (1997), Higgins *et al.* (2001), Holdaway (1988), Howard (1957), Kinsky (1970), Michelsen (1982), Michelsen-Heath (1989), Moon (1992, 1994), Moon & Lockley (1982), Riney (1953), Robertson, C.J.R. (1985), Robertson, H. & Heather (2001), Sibson (1974), Soper (1961a, 1976), Stattersfield & Capper (2000), Williams (1975).

Class AVES

Order PASSERIFORMES

Suborder MENURAE

Family ATRICHORNITHIDAE (SCRUB-BIRDS)



- Small, largely terrestrial, highly secretive birds with short, rounded wings, broad and rather long tail often carried cocked, long and strong legs with well-muscled thighs.
- 17-23 cm.



- South-west and eastern Australia.
- Dense undergrowth in scrub, thicket and forest.
- 1 genus, 2 species, 3 taxa.
- 1 species threatened; none extinct since 1600.

Systematics

The scrub-birds are generally placed in their own family, the Atrichornithidae, but they have at times been treated as a subfamily of the lyrebirds (Menuridae) of eastern Australia, with which they share some characteristics. The scrub-birds have, in fact, been grouped with the lyrebirds since the first anatomical studies were carried out on nineteenth-century specimens. A. H. Garrod's findings, which were published in a number of papers in the 1870s, revealed that both the lyrebirds and the scrub-birds have only three pairs of intrinsic syringeal muscles, rather than the 5-9 pairs possessed by other oscine songbirds, although the scrub-birds also have a few fibres of a fourth pair; on the other hand, these muscles are attached to the end of the bronchial semi-rings, the typical oscine condition. He concluded that the lyrebirds and the scrub-birds were closely associated, and he placed them next to the oscines, a treatment adopted by all subsequent authors for a century or so. During this period, the two groups were together treated as distinct from all other passerines and were given various taxonomic rankings, most notably that of a separate suborder (Menurae) positioned between the suboscines and oscines, as herein. Contrary to this view, in the 1970s on the basis of the unmodified stapes it was proposed that they should perhaps be considered true oscines, a conclusion also supported by molecular-genetic studies.

Extensive research in the 1970s and later, including numerous studies on a single specimen of the Noisy Scrub-bird (*Atrichornis clamosus*), supported the contention that lyrebirds and scrub-birds are, indeed, each other's closest relatives. As well as having similar syringeal muscles, they have been shown to share similarities in body pterylosis and in the musculature of the fore and hind limbs. The two families do, however, differ in wing and tail pterylosis, as well as in details of the natal down and plumage development; further, the DNA-DNA hybridization distances between them are fairly large. Their relationships with other Australian passerine families, however, are less clear. DNA-DNA hybridization studies and protein electrophoresis agree on the proximity of Atrichornithidae and Menuridae, but give conflicting results on the proposed relatedness of both to the Australasian treecreepers (Climacteridae) and the bowerbirds (Ptilonorynchidae). The DNA work also suggests that the scrub-birds have been separated from the lyrebirds since the Eocene. They are likely, therefore, to be part of an ancient radiation of the earliest songbirds in Australia.

Fossil remains of Noisy Scrub-birds have been found in caves in the south-west of Western Australia, in deposits dated at 3000-6000 years old. The number of scrub-bird remains at this site suggests that the birds were plentiful at that time.

Morphological Aspects

Scrub-birds are small, semi-flightless, ground-dwelling birds living in dense undergrowth in scrub and rainforest habitats. Their short, rounded wings are unsuitable for true flight. They have a greatly reduced sternum, somewhat poorly developed breast muscles and rudimentary clavicles (furcula), all of which reflect their poor flying abilities. The feathers are soft and pliant and, except for the primaries, tend to lack the interlocking hooks of most bird feathers. As a consequence, they do not zip together but are quite open, giving the feathers a loose appearance, another indicator of poor flying abilities. On the lower back, especially, the feathers are surprisingly long.

The sexes are distinct. The male Noisy Scrub-bird is the largest member of the family and measures 12-13 cm from the tip of the bill to the base of the tail, the latter adding a further 10 cm. It weighs between 50 g and 60 g, with a mean of 52 g. By contrast, the female weighs about 34 g. The male Rufous Scrub-bird (*Atrichornis rufescens*) approaches the size of the female Noisy Scrub-bird.

Similarly, the plumage differs between the sexes. The males have a distinctive black area on the throat and upper chest, this being bordered by prominent white malar stripes. On the male Rufous Scrub-bird this dark area is extensive. On the Noisy Scrub-bird it is narrower and more obviously transverse, and the contrasting white chin area and malar stripes are larger. The dark throat patch is, in fact, created by white-tipped black or dark grey feathers. When the head is pointed downwards, the overlapping pale tips may disguise the dark band of the Noisy Scrub-bird. When he throws his head back to sing, however, the dark feather bases are exposed and the throatband is emphasized. The white tips wear away as the season progresses, and this can make the dark area more prominent. In the male Rufous Scrub-bird, the dark throat patch, although more extensive than that of its congener, is less clearly outlined because it is surrounded by brown feathers. Neither of the female scrub-birds has a dark throat patch.

When an individual is observed in the wild, the throat coloration is not always apparent and the males of both species generally appear to be small brown birds. This is especially true when a rapidly moving scrub-bird is merely glimpsed in the low light

conditions typical of the dense habitat occupied by the two members of this family. At close quarters, however, it can be seen that the feathers of the upper body are finely vermiculated with irregular dark bands, and adults of both sexes exhibit a rufous area around the vent. These features are particularly noticeable on the Noisy Scrub-bird.

Both species have a broad and rather long tail, with rounded feather tips, and this is often carried cocked. The legs are long, with well-muscled thighs, and the birds have surprising strength. The bill is bicoloured, the upper mandible being of a dark ash-grey and contrasting with the pale fleshy pink of the lower mandible, which curves downwards at the gape. A small narrow ridge on the upper mandible extends into the feathers of the head and ends in a small hump. This structural feature may be useful in protecting the feathers when the scrub-bird feeds among leaf litter, as both species often use the head to lift and turn over leaves in order to reveal prey (see Food and Feeding).

Juvenile plumage consists of chestnut-brown feathers on the head, nape, upper back, wings and underparts. The lower back, tail and vent area are dark grey. In its first summer, the juvenile moults into a pre-basic adult plumage. This is similar to that of the adult, but, in the case of males, is less strongly marked.

Only few details are available on the moult of this family. The adult Rufous Scrub-bird undergoes a complete moult after breeding, although the precise timing of this is uncertain. One specimen was in active primary moult in October and another in December; active moult of the tail feathers has been recorded in August and October, and that of the body in December. The primaries are replaced from the inner ones outwards. The adult Noisy Scrub-bird is likely to have a similar strategy, its post-breeding moult probably taking place during the austral summer, although individuals with incomplete moult have been trapped in June in some years.

Soon after fledging, the young undergo a partial moult in which most of the body feathers are replaced, with the larger upperwing-coverts, the remiges and the rectrices being retained. In captivity, two female Noisy Scrub-birds completed this partial moult in 49 and 55 days, respectively, while one male required 79 days.

Habitat

The two species of scrub-bird live on opposite sides of the Australian landmass, each inhabiting dense vegetation. Within its tiny global range in the south of Western Australia, the Noisy Scrub-bird occupies moisture-gaining sites in scrub, thicket and low forest. It favours low forest in deep gulleys at near-coastal sites in the Two Peoples Bay area, east of Albany, but it also occurs in densely vegetated patches of tall shrubs on the hillsides and in forest formations along watercourses. The Rufous Scrub-bird, restricted to the eastern side of Australia, lives among dense understorey vegetation of subtropical and temperate rainforest. It also occurs on the edges of eucalypt (*Eucalyptus*) forest abutting rainforest where there is a rainforest understorey, and it occupies sites along watercourses, on ridges and around treefalls.

Dense vegetation provides essential protection for the semi-flightless scrub-birds. Both species also require plentiful leaf litter, debris and rotting wood, which offer habitat for the invertebrate fauna on which the birds feed (see Food and Feeding). Nests of Noisy Scrub-birds are placed in clumps of sedges or piles of debris, often near the centre line of a gulley or the edge of a small stream. Those of Rufous Scrub-birds are built in similar situations. Good scrub-bird habitat, therefore, usually contains a mosaic of dense vegetation at about 1 m above the ground, small open patches of dense leaf litter with a rich invertebrate fauna, and areas with clumps of sedges suitable for nesting.

In Western Australia, the vegetation in Noisy Scrub-bird habitat may be fire-prone and wildfire can occur at frequent intervals. In moister areas, the scrub-birds will sometimes move into a burnt area within a few years, but periods of at least ten years between fires are required in order to allow the development of the appropriate combination of dense cover and invertebrate fauna to support numbers of breeding birds. The optimal post-fire age of the vegetation for scrub-birds is not known. Studies have demonstrated, however, that Noisy Scrub-birds continue to do well in areas on Mount Gardner, in the Two Peoples Bay region, which have not been burnt for more than 50 years, and farther east, on Bald Island, the species lives and breeds in habitat last burnt more than 100 years ago.



*The **Rufous Scrub-bird** is typical of the Atrichornithidae in being small, with non-descript brown plumage, short, rounded wings, and a long graduated tail. Each rectrix is rounded, as can be seen here, and the tail is often held cocked. These morphological features, especially the weakness of the wings, are linked to a sedentary lifestyle and terrestrial habits; both species in the family rarely fly more than a couple of metres downslope. The bulging ridge at the base of the culmen is another characteristic feature, possibly associated with their habit of flicking over leaves and twigs while foraging.*

[*Atrichornis rufescens*, Australia. Photo: E. McNamara/Ardea]

General Habits

Scrub-birds are difficult to observe in the field, and studies of their behaviour are often not practical. Visibility is low in the dense vegetation, and the birds rarely reveal themselves. When they do, they do not remain in view for long. The low light levels and the birds' cryptic coloration and behaviour can frustrate all but the most patient of birdwatchers. Nevertheless, scrub-birds are highly inquisitive and will often approach an observer, usually keeping out of sight while moving rapidly around the watcher, sometimes while singing. The loud, far-reaching territorial song of the male (see Voice) is the most obvious characteristic and the best means of detecting the bird. Males spend a good deal of time singing, especially during the breeding season, and holders of long-term territories sing throughout the year, although at a much-reduced level during the summer months. Female scrub-birds, on the other hand, do not sing, and they are, therefore, even more difficult to locate than are males.

Not surprisingly, both members of the family are sedentary and territorial. Their short, rounded wings render them incapable of efficient flight. They do, however, use their wings to assist in leaping and scurrying about in the vegetation, sometimes making fluttering downward "flights" of a metre or two. They also use the tail and the powerful legs to achieve very rapid acceleration. Although basically terrestrial, scrub-birds are also good climbers, and they can rapidly ascend shrubs and trees by squirrelling up trunks and along branches. When feeding, they generally move methodically around an area, mostly keeping within cover, but occasionally venturing into small open patches where the leaf litter may be thicker. When agitated, however, they are capable of moving through dense vegetation surprisingly quickly, sometimes making use of ground-level runways created by small marsupials such as quokkas (*Setonix brachyurus*) and quendas (*Isoodon obesulus*).

Male scrub-birds defend territories throughout the year, and over successive years. Territories of male Noisy Scrub-birds can be up to 5 ha or more in extent, although the core area where the male spends most of his time is generally smaller, at around 1 ha. The territories are generally well dispersed in the landscape but tend to be concentrated along gulleys, where they appear to be linear, matching the riparian vegetation. Even in good habitat, the centres of neighbouring territories are often 200-300 m apart. During the course of the day, the male moves slowly around the core area of his territory, feeding and singing as he progresses. During the breeding season he will often interact vocally with other males.

Territories can persist for long periods. At Mount Gardner, for example, some Noisy Scrub-bird territories have been occupied continuously for more than thirty years, although the occupants have undoubtedly changed during this period. The experimental capture and removal of a territorial male will usually result in its replacement by another male, sometimes within a few hours. This suggests that there could be rapid turnover in territory occupancy. Indeed, radio-tracking of Noisy Scrub-birds at Two Peoples Bay and at reintroduction sites (see Status and Conservation) has shown that ownership of territories can change several times within a few days.

Although the behaviour of the Rufous Scrub-bird is poorly known, it seems to be similar to that of its congener. Males of this species are said to defend territories of 5-10 ha, although the average size of male territories in one study was only 1·17 ha. As with the Noisy Scrub-bird, the males spend most of their time in a core area which is somewhat smaller in extent. Females apparently occupy home ranges which partly overlap the territory of the male. During the breeding season their home ranges appear to be centred on the nest-site, which they also defend from other females.

Some males, of both species, defend territories for only a short period of time, varying from a few days to about three months. These are in suboptimal areas, with insufficient habitat suitable for breeding, but generally adequate to satisfy the bird's feeding requirements for the period of occupancy, which is usually the length of the breeding season. The occupants of such territories are presumed to be non-breeding immatures.

When resting during the daytime, scrub-birds perch in shrubs and small trees, on logs and fallen branches, or on rocks or ground debris, up to 60 cm above the ground. The Rufous Scrub-bird has also been seen to perch on the side of a rough-barked tree. At night, males normally roost outside the core area, often on the edge of the territory. The Rufous Scrub-bird prefers sites close to the ground, and on one occasion an individual was observed as it slept low down on the small limb of a fallen pine (*Pinus*). Male Noisy Scrub-birds make use of a number of roost-sites, which are generally at or near the tops of shrubs or small trees. Captive individuals of this species have been observed to move up to the tops of shrubs 2 m tall as darkness falls.

Visual displays and postures are seldom observed, and their functions are uncertain. One display has been described for the male Noisy Scrub-bird. An individual, perched about 1 m up on the branch of a shrub, lowered his wings, fanned his tail, and then brought the tail forwards until it was almost parallel to his back, whereupon he rapidly quivered the whole body and tail while uttering the loud territorial song. Although this posture, which is reminiscent of a well-known display of the lyrebirds, has not, it seems, been observed by other ornithologists, body-quivering while singing is common. A so-called "rodent-run display", performed by the female, appears to be restricted to the vicinity of the nest (see Breeding). When running on the ground, scrub-birds often carry the tail cocked, with the body in a crouched posture and the head and neck extended, but it is uncertain just how many details of this behaviour are related to alarm reaction.

There appears to be no documented information on the maintenance behaviour of the two species. One would expect bathing, at least, to be a fairly common practice, but no information exists for wild-living individuals. Even in captivity, when water in a small dish has been continuously available, Noisy Scrub-birds have never been seen to use this for bathing. Captives of this species have, however, been recorded as preening occasionally.

Voice

In contrast to their skulking and elusive behaviour, the male scrub-birds are remarkably conspicuous vocally. The loud territorial song of the male, almost deafening when heard at close quarters, is given frequently. That of the Rufous Scrub-bird is relatively simple, consisting of a series of repeated strident "chip" or "cheerp" notes which gain in intensity to reach a crescendo. Bouts of singing last for about ten minutes, but can extend to twice that length of time. The male Noisy Scrub-bird's territorial song also consists of a succession of strident notes, usually rising in pitch and developing into a cascade of pealing notes, before ending abruptly. The notes are sometimes on a descending scale, but the song is always loud and penetrating. Indeed, it is from the very loud song of the male that the Noisy Scrub-bird acquired both its English and its scientific names. This song carries well and can be heard up to 1·5 km away.

During the breeding season, territorial males sing at intervals throughout the day, most actively early in the morning and late in the afternoon. The singing of one territorial male often appears to elicit song from neighbouring males, and the ensuing song "contest" may engage several territorial males within earshot of the first male. Where there is a high density of scrub-bird territories, these engagements can result in almost continuous song during the day. Noisy Scrub-birds will also sing at night, especially when moonlight brightens the habitat.

Both territorial and non-territorial males of the Noisy Scrub-bird produce another song, This is known as "short song", because it is usually, but not always, of shorter duration than is the territorial song. The short song is also loud and resonant, but is not so directional as territorial song, and its structure differs, being more like a continuous outpouring of notes of similar intensity; sonagram analysis has suggested that some mimicry of other species is occasionally incorporated, but this is certainly not noticeable to the human ear. This song is often used during interactions between males, and between males and females, and is probably less assertive than the territorial song. Males also use a single-note call or a combination of two or three notes, and alarm calls.



*As demonstrated by this **Noisy Scrub-bird**, terrestrial habits beget strong legs and sturdy feet. The other feature associated with partial flightlessness is that the barbs of the body feathers are not hooked together by barbules. This leads to the obvious fluffy or downy effect visible in this photograph. Of the two members of the family, this is the larger bird, with duller brown plumage and a more conspicuous rufous vent. Both species have a pale lower half to the bill, contrasting with a darker upper mandible.*

[*Atrichornis clamosus*, Two Peoples Bay Nature Reserve, Albany, Australia. Photo: Jiri Lochman/ Lochman Transparencies]

Female Noisy Scrub-birds do not sing, but use a sharp alarm call and a soft contact call. When agitated, particularly when disturbed at the nest, a female will often produce a series of high-pitched squeaks while moving rapidly around the nest-site (see also Breeding).

Unlike that of its congener, the male Rufous Scrub-bird's repertoire includes a wide variety of mimicry of other bird species, although such mimicry appears not to be common. It also contains loud scolding "churr" notes and a single ringing note. Females of this species are far less vocal than are the males, but they do sometimes engage in song duets with the male. In these duets, the female's song is a softer but more complex version of the male's territorial song. Females also utter ticking calls and high squeaks, mostly when tending nestlings, and chattering notes when feeding a fledgling.

Food and Feeding

Scrub-birds forage for invertebrates in leaf litter on the ground, in decaying wood, and among the stems and leaves of understorey plants. They poke the bill into crevices in wood and insert it beneath leaves, sometimes lifting the leaves with the bill and head and then lowering them back into place. At other times they use the head to shovel under the leaves. The Rufous Scrub-bird, in particular, is noted for its habit of burrowing through deep leaf litter in this manner, a characteristic that has earned it the colloquial name of "Mouse bird". It then scratches at the ground in order to reveal prey items. The Noisy Scrub-bird relies more on flushing prey from the litter and other debris.

The diet of the Rufous Scrub-bird is not well known. Beetles, scrub-snails (*Helix*) and snail eggs are recorded as being taken by this species, which is also thought to consume some plant seeds. More information is available on the foods eaten by the Noisy Scrub-bird. These include invertebrates of a wide variety of orders, but studies at Two Peoples Bay indicate a preference for ants (Formicidae), beetles, spiders and crickets (Orthoptera). An old report refers to seeds having been found in the stomach of one adult, but these are a most unlikely item for a species that, as modern studies and all observations indicate, has a diet restricted to live food. It is possible that the items identified as such were, in fact, the head capsules of ants, which can look very like seeds. Nestling Noisy Scrub-birds also receive a wide range of invertebrates, with 18 orders recorded. The females bring relatively large items, mainly spiders and crickets, with which to feed their young in the nest; in addition, they sometimes feed the chicks with small amphibians and reptiles, and there are records of the myobatrachian *Crinia georgiana*, skinks (Scincidae) and the gecko *Phyllodactylus marmoratus* being delivered to nestlings.

Song output is maintained at a high level during the breeding season, and the energy for this activity requires large quantities of food. In captivity, scrub-birds will often eat half of their own body weight in food each day.

Breeding

Some male Noisy Scrub-birds occupy territories which they defend or advertise with loud song throughout the year, whereas others sing mainly during the breeding season. Song intensity increases from April, usually when the opening rains come to south-west Western Australia. It continues at a high level through June and July and decreases through August and September, dropping off rapidly in October. This singing activity defines the breeding season. In the case of the Rufous Scrub-bird, singing is at a peak between September and January, and these times appear to mark the limits of the breeding season of the species.

It has been stated that Noisy Scrub-birds are monogamous, but long-term observations do not support this. Indeed, it is probable that the males are polygynous. Males are seldom seen with females, and the only roles which they play in the reproduction process are those of defending the territory and mating. A few observations suggest that the female seeks out the singing male at mating time, but males also appear to be ready to mate or, at least, to interact with any female. Nests are almost always on the outskirts of male territories, and often midway between two territories, and occasionally two active nests are found within a few metres of each other. In fact, much of the breeding behaviour of the territorial males can be likened to that associated with an exploded-lek system.



Although they are often difficult to see, scrub-birds are easily heard. The voice of the ***Rufous Scrub-bird*** *is the simpler: a series of strident "cheerp" notes that gains intensity until a vibrant crescendo. This song is so loud that it is almost deafening from close range and liable to leave a ringing in the ears. In the breeding season it is given at intervals through the day, and regularly on moonlit nights. The female does not generally sing, but she can produce a softer, more complex version of the male song, sometimes joining him in a duet.*

[*Atrichornis rufescens rufescens*, Lamington National Park, Queensland, Australia. Photo: Roger Brown/ Auscape]

Female scrub-birds build their nests without any help from the male. The female Noisy Scrub-bird tends to build in the same area in successive years, often within 5 m of her previous nest if that was successful; if disturbed, she will usually construct a new nest about 50 m away. The Noisy Scrub-bird's nest is typically built at about 80 cm from the ground, or lower, and is well hidden in a clump of sedges (*Lepidosperma*, *Gahnia*) or, sometimes, in a dense shrub or a pile of debris. That of the Rufous Scrub-bird is generally placed very low down, usually about 15 cm from the ground, in a clump of *Gahnia* or *Carex* sedges, in a grass tussock or in a small tree-fern.

The nest of both species is a domed structure with a side entrance and is constructed from long, pliant leaves of sedges and grasses. That of the Rufous Scrub-bird consists mainly of *Gahnia*, *Carex* and *Xerotes*, sometimes with some leaves or pieces of dead tree-fern incorporated, whereas the Noisy Scrub-bird's nest is built mostly from *Lepidosperma* and *Anarthria* and, less commonly, *Gahnia*, *Agonis* and *Dryandra*. The inner layers of the Noisy Scrub-bird's nest are quite tightly bound, but the outer layers are looser. The whole structure is typically about 18 cm high, 12·5 cm wide and 14 cm deep, and the walls are up to 5 cm thick. There is often a small "hood" above the entrance and usually a runway, which may be 20 cm long, sloping up to the opening. The runway is made by loosely weaving the leaves of the substrate. The bottom part of the nest-chamber can be 5 cm thick. The nest of the Rufous Scrub-bird is similar but slightly smaller, and the entire interior is lined with a cardboard-like material made of wood fibre, which provides a smooth, dry surface. The Noisy Scrub-bird lines only the bottom half of the nest in this way. No feathers or other material are used as lining.

Female Noisy Scrub-birds generally begin nest-building in May, and the majority of the single-egg clutches are laid in the latter half of June. Occasionally, the egg is laid earlier. If an egg is preyed on, the female will rebuild in a different location and lay again, which can result in eggs being incubated late in the season. From the few comparable details which exist for the Rufous Scrub-bird, it appears that this species lays in September or October and that the clutch consists probably of two eggs.

The eggs of the Atrichornithidae are oval in shape. They are slightly glossy, and have a very pale buff to pinkish-white ground colour irregularly marked with brownish-red to dark purple-brown spots, speckles and blotches, which are concentrated at the larger end. The eggs of the Rufous Scrub-bird measure about 22·9 × 17·5 mm on average, while those of the Noisy Scrub-bird are somewhat bigger, with dimensions of about 28·5 × 19·8 mm.

The incubation period of the Noisy Scrub-bird is generally five to six weeks, which is rather long for a small passerine. Incubation by this species takes place in the coldest part of the year, when ambient daytime temperatures in a deep, shaded gulley may be below 12°C. The female leaves the nest at intervals during the day in order to feed, and is sometimes absent for several hours. Despite the thick insulation provided by the nest, the female's absence results in cooling of the egg, a factor which would contribute to the lengthy period of incubation. In observations of individuals in captivity, in Perth, where food was provided and the ambient winter temperatures were higher, shorter incubation periods of 30 days were found to be common. The incubation period of the Rufous Scrub-bird is not known, but it is believed to be similar to that of its congener.

On hatching, the chick has a covering of long downy feathers on the upper parts of the body. It is fed by the female. No information on the care of the chick and subsequent aspects of reproduction is available for the Rufous scrub-bird. The following details, therefore, apply to the Noisy-Scrub-bird, but it seems likely that some, at least, would be applicable to both species. In the initial stages, the female broods the chick after each feed; daytime brooding ceases after about ten days, but the female continues to brood her young at night until the nestling fledges. She removes faecal sacs directly from the cloaca of the nestling, which presents its posterior to the female as soon as she arrives at the nest. The female deposits the faecal sacs under a shrub or in a pool in a nearby stream. As the chick grows, it may be fed relatively large food items, including small frogs, geckos and skinks (see also Food and Feeding). The young scrub-bird leaves the nest at three to four weeks, but it takes a surprisingly long period to reach independence. Indeed, it may remain in the company of its mother for three to six months after fledging.

The female is always agitated by the presence of an intruder near the nest, and in these circumstances she keeps a very close watch on the unwanted visitor. On leaving the nest containing a chick, the female has been reported to make fast circuits of the nest-site for up to 20 minutes, calling noisily, and occasionally

performing a running display in which the body is held low, with the head and neck parallel to the ground and the wings spread, with the outer wing trailing. Although this behaviour has been termed the "rodent-run display", it should be pointed out that such a display has not been corroborated by others in many decades. Indeed, the description of it equates to the normal nest-defence behaviour of a female when disturbed at the nest.

Little is known about chick survival or fledging success. In some Noisy Scrub-bird populations, however, survival rates may be as high as 90%. It is thought that the mardo (*Antechinus flavipes*) may prey on this species' nests, but this has not been documented for certain. This small marsupial carnivore is probably capable of taking an egg, at least from an unoccupied nest, but it is active at night, when the female scrub-bird is present and would probably defend the nest vigorously. Nevertheless, mardos do take up residence in old nests. It is possible that southern bush-rats (*Rattus fuscipes*) also take nest contents, but there is no evidence for this. Nest predation by snakes, on the other hand, seems less likely, since these reptiles are generally inactive during the main nesting time of the Noisy Scrub-bird.

Female Noisy Scrub-birds are capable of breeding in their first year, while males may take two or more years to reach sexual maturity. Males are usually two years old before they begin to sing, and they may not become fully mature until their third year.

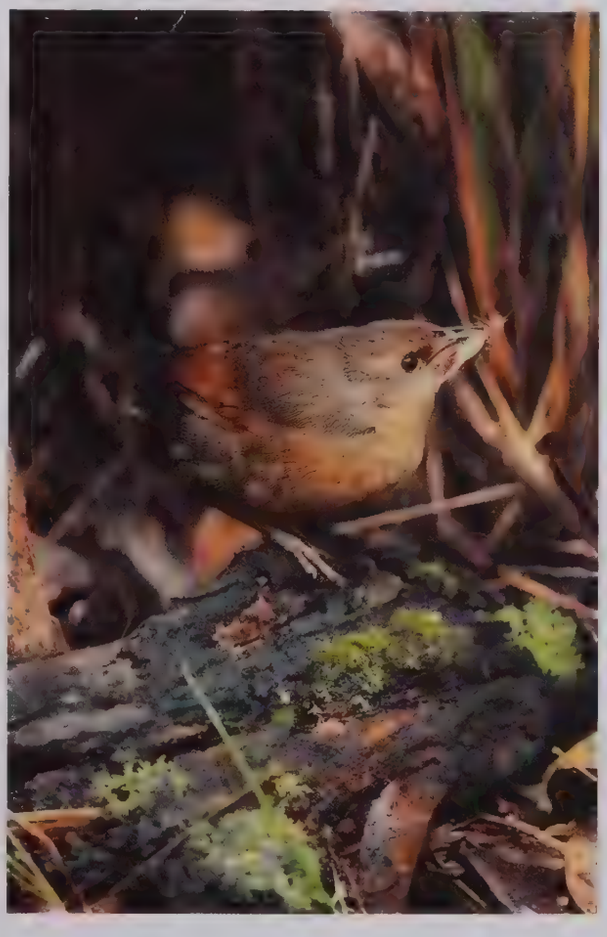
Movements

Scrub-birds are generally sedentary. They do not make any regular seasonal movements, their short, rounded wings and other morphological features (see Morphological Aspects) rendering them incapable of sustained flight. Males defend long-term territories within which the core area (see General Habits) remains constant from year to year, and females build their nests in the same area each year (see Breeding).

The young appear to stay in or near their natal territory for some years before acquiring their own territory. This can be either the natal territory or another one nearby. Dispersal farther afield may be uncommon, as subadult males are often found in or near an existing, occupied territory. A few male Noisy Scrub-birds, however, are known to have dispersed up to 10 km from the nearest breeding areas, and the actual distance travelled "on the ground" may, of course, be much greater. Moreover, an immature Rufous Scrub-bird, when it was mist-netted at Pappinbarra, in New South Wales, had travelled at least 20 km from the nearest suitable breeding habitat, although dispersal over such distances is likely to occur only occasionally.

Dispersal can enable scrub-bird populations to expand and to occupy new areas of habitat. For example, new territories and new subpopulations of Noisy Scrub-birds have been discovered about 3 km from known existing populations, presumably as a result of adult or subadult individuals dispersing away from the natal territories. In addition, territory-holding adult males, when translocated and then released, are capable of moving distances of up to 3 km to a new site.

Continuous dense cover is required to facilitate dispersal. Although a scrub-bird will move across small roads having a clearway of 5-6 m, it approaches these areas very cautiously; when it does decide to cross, it does so at speed and immediately dives into cover on the other side. Scrub-birds do not traverse larger cleared areas such as farm paddocks, bare dunes, or country cleared of understorey vegetation by a recent fire.



Noisy Scrub-birds *scurry and ferret about in undergrowth and leaf litter. They insert their bills into holes in decaying wood, flip dead leaves with their bills and even tunnel under deep piles of twigs and leaves. They are searching for a variety of prey types, both insect and non-insect, including ants, beetles, spiders and crickets. Although arthropods make up most of the diet, some small vertebrates, including tiny frogs, skinks and geckos, are captured in the breeding season and fed to nestlings. Early reports of seeds in the diet are thought to be erroneous, and both species of scrub-bird seem always to eat live food.*

[*Atrichornis clamosus*, Two Peoples Bay Nature Reserve, Albany, Australia. Photo: Graeme Chapman]

Relationship with Man

Because of their secretive and elusive nature, the scrub-birds are little known to humans in general. Even ornithologists have hitherto been unable to uncover many of the secrets of these birds' lives, and many aspects of their biology and ecology remain to be elucidated. A colloquial name for the Rufous Scrub-bird is "Mysterybird", which seems highly appropriate in vew of the paucity of data on this species. Another of its names, incidentally, is "Mouse bird", alluding to its habit of burrowing through leaf litter on the ground (see Food and Feeding).

In 1842, J. Gilbert discovered the Noisy Scrub-bird near Mount William, in the hills south of Perth, but it was not found again in this area. The bird was, however, well known to the Noongar people of the King George Sound area, on the south coast of Western Australia, who referred to it as "Jeemuluk", and Gilbert found the bird to be reasonably common at the sound in 1843. By the end of the nineteenth century, however, Noisy Scrub-birds were no longer common and even dedicated ornithologists could not locate the bird in known habitats (see Status and Conservation). In 1948, near the original discovery site, a memorial was raised to Gilbert and the "sweet-voiced bird of the bush".

Although the male scrub-bird sometimes gives away his presence by the rustling sound that he makes when moving through the vegetation, it is usually his deafeningly loud song (see Voice) that is the sole means by which a human observer is made aware of an individual bird's presence. It is hardly surprising, therefore, that, so far as is known, it is only this striking vocalization that has had any influence on the human populations which live in the areas of Australia occupied by the two scrub-birds. Indeed, Gilbert's original field notes on the Noisy Scrub-bird refer to the ear-ringing sensation produced by the bird's song when heard at close quarters. J. Gould received the specimens and used Gilbert's notes as the basis for the scientific name *clamosus*, meaning noisy or very loud. The song can, in fact, be quite musical; it is not really "noisy", but it is certainly loud.

Because of its history of apparent extinction followed by "rediscovery" (see Status and Conservation), the Noisy Scrub-bird has become sufficiently well known in Western Australia to have had streets and sporting teams named after it. More significant, however, is the impact that it has had on conservation in Australia. The rediscovery and conservation of the Noisy Scrub-bird exemplify its most important relationship with humans, as a symbol both of what might have been lost and of what can be done in order to reduce the loss of biodiversity that the world is currently facing. Even before the species' rediscovery it had an influence on human thinking and behaviour: scientists were fascinated by

the intriguing questions that it raised, and ornithologists were compelled to explore infrequently travelled areas of the south coast in search of it. Few birds indeed have had a memorial raised to their "memory". When it was rediscovered, the plight of a small bird on the brink of extinction sparked unexpected interest and determination from conservationists of the time. The success of those conservationists of the early 1960s was unprecedented in Western Australia, and occurred two decades before the better-known "battles" over the Franklin Dam, in Tasmania, or the logging of Terrania Creek, in New South Wales. Furthermore, the Noisy Scrub-bird has been an "icon" threatened species in Australia for nearly 20 years, and it even has an international profile. The success of the conservation programme has encouraged other, similar initiatives for threatened species not only in the state of Western Australia, where recovery programmes for the Western Bristlebird (*Dasyornis longirostris*) and the western population of the Ground Parrot (*Pezoporus wallicus*) are directly based on the procedures developed for the Noisy Scrub-bird, but also throughout the entire country of Australia.

Status and Conservation

The ranges of both members of this family have contracted substantially since the mid-nineteenth century, and both currently exist in very small populations. The Noisy Scrub-bird was at one time thought to have been exterminated, but a very small population was rediscovered in 1961. Under the care of conservationists, it has made a steady return from the very brink of extinction.

In the nineteenth century, soon after its discovery, the Noisy Scrub-bird appeared to be reasonably common within a small region around the King George Sound, in south-west Western Australia. Over three or four decades from the mid 1840s onwards, it remained common enough for museum collectors to gather a few specimens, despite the species' elusive nature. One contemporary writer stated that it was "not, strictly speaking a rare bird, but is rarely seen". Nevertheless, by the turn of the century the scrub-bird had become decidedly rare, and ornithologists failed to find it in any of its known habitats. Through the first half of the twentieth century the species was believed to be extinct, since many dedicated searches in areas thought to be suitable had been unsuccessful.

In 1961, local naturalists found a tiny population of Noisy Scrub-birds on Mount Gardner, at Two Peoples Bay, east of Albany. Fewer than 100 individuals were all that remained of the species, and they were confined to a single location. The bird's limited habitat was under threat from frequent wildfire, unrestricted access, and the imminent development of a town site at the foot of the mountain. The combination of the Noisy Scrub-bird's seriously precarious situation, its elusive nature and mysterious relationships, and a long history of scientific interest in the species inspired concerted action by local and international conservationists to save the bird from extinction.

Within a few years, Two Peoples Bay Nature Reserve was established in an effort to protect the small population. This protected area encompassed all known Noisy Scrub-bird habitat. A number of biological studies were carried out, with the aim of improving knowledge of the species and its ecological relationships. Although the population trend was stable, the vulnerability of the single population in the Mount Gardner area was of major concern. If the species was to thrive, it needed more habitat than was available within the Two Peoples Bay Nature Reserve. In 1976, a small captive-breeding colony was set up in an attempt to breed the birds for a reintroduction programme. Even though the scrub-birds mated, nested and laid eggs, only one captive-bred young was raised to maturity during the five-year project.

Careful management of the reserve, and especially the exclusion of fire, had resulted in some growth in the wild-living population in the late 1970s, and a reintroduction programme, based on individuals captured in the wild at Two Peoples Bay, was begun in 1983. It was hoped that this programme would allow the population to increase in size and, by extending its geographical spread, would reduce the species' vulnerability to wildfire. Although several reintroduction attempts failed to lead to the establishment of viable populations, success was achieved at four sites. In the 1990s, these new populations resulted in



*The **Noisy Scrub-bird** builds a dome-shaped nest out of grasses. It is often placed c.20 cm above the ground, with a loosely woven ramp leading up to a side entrance, and a slight hood protecting the nest from above. An alternative site is in sedge-beds or thick undergrowth, wherein the nest is placed higher above the ground. The clutch consists of a single egg, which is incubated for 5-6 weeks before it hatches, an extraordinarily long period for a small passerine. Males appear to be polygamous, and they play no part in nest construction, incubation or the provisioning of nestlings.*

[*Atrichornis clamosus*, Two Peoples Bay Nature Reserve, Albany, Australia. Photo: Graeme Chapman]



*After its discovery, the **Noisy Scrub-bird** was thought to be common in a small range in Western Australia, but by the 1900s it had declined dramatically. Indeed, it went more than 50 years without being seen, and it was suspected to be extinct before being found again in 1961. The success of this rediscovery was tempered by the grave situation of the species: only an estimated 100 individuals survived. A conservation effort sprang up, leading to the establishment of Two Peoples Bay Nature Reserve. Because of this protection, along with several reintroduction programmes, numbers began to increase, and the population now exceeds 2000 individuals.*

[*Atrichornis clamosus*, Two Peoples Bay Nature Reserve, Albany, Australia. Photo: Jiri Lochman/ Lochman Transparencies]

major growth of the Noisy Scrub-bird population. The birds which were translocated to Mount Manypeaks, to the east of Two Peoples Bay, in 1983 and 1985 have produced a population which, by 2001, was four times the size of the original one at Mount Gardner. Noisy Scrub-birds now exist in several populations, spread over nearly 50 km of near-coastal country, in nature reserves and national parks east of Albany. The easternmost point of the species' current distribution is Bald Island, where small numbers were released in 1992. In 2001, the Noisy Scrub-bird's total population was estimated to be in the region of 2000 individuals.

Although a great deal of effort has been expended on the conservation of the Noisy Scrub-bird since its rediscovery some 40 years ago, the work done in the name of this one species has been of great benefit to many other animal species. Other birds occurring in Two Peoples Bay Nature Reserve include the globally threatened Western Bristlebird, categorized as Vulnerable, and the Near-threatened Western Whipbird (*Psophodes nigrogularis*), of which the two Western Australia subspecies are regarded as vulnerable; management of the reserve has allowed the numbers of both species to increase. The reserve also protected the last population of Gilbert's potoroo (*Potorous gilbertii*), and this mycophagous marsupial was rediscovered at Two Peoples Bay in 1994.

The Noisy Scrub-bird's improved conservation status was recognized in 1997 when the Western Australian government recategorized it from Endangered to Vulnerable, on the basis of the species' positive population growth. In the last few years, some scrub-birds have been reintroduced to remaining habitat in the Darling Range, south of Perth, near the site where Gilbert had first discovered the species in 1842.

The change from the fire regime of the indigenous people to that practised by European settlers had a damaging effect on Australian wildlife. It is thought that the inappropriate fire regime practised by the early settlers resulted in more intense wildfires, which would have devastated Noisy Scrub-bird habitat in the south-west. In addition, logging of the forest, grazing by domestic stock, and the wholesale clearing of native vegetation for agriculture have all been implicated in this species' rapid decline in the late nineteenth century.

The Rufous Scrub-bird fared better during this period. It was discovered in 1865, on the Richmond River in New South Wales, and was the focus of some early studies. Nevertheless, logging of its rainforest habitat and exploitation of lowland areas for farming have reduced its distribution to higher-altitude rainforest. Its population at the time when European settlers arrived is believed to have been about 12,000 pairs, the majority of which, it seems, inhabited lowland areas. Most of the lowland habitat was cleared in the years immediately following colonization by Europeans, and the species soon became confined to higher-lying forest, mostly above 600 m. Surveys carried out over a century later, in the period from 1979 to 1983, produced an estimate of no more than about 2500 pairs, of which only 730 were of the northern, nominate race. More recent field studies, undertaken at the very end of the twentieth century, indicate that the species, especially the nominate race, has probably suffered a further decline.

The Rufous Scrub-bird is currently distributed in several isolated populations. Many of these are in national parks and are reasonably secure. Fortunately, habitat clearance seems not to be a continuing threat. On the other hand, about 65% of all pairs are found in eucalyptus forest, where suitability of the habitat could be compromised by inappropriate burning and logging practices. As a result, the Rufous Scrub-bird has been placed by BirdLife International in the conservation category of Near-threatened.

General Bibliography

Ames (1971), Bock (1994), Chisholm (1921), Chisholm & Davies (1988), Christidis & Boles (1994), Clench (1985), Cracraft (1981), Higgins *et al.* (2001), Keast (1972), Raikow (1985), Rands (1991), Rich *et al.* (1985), Robinson (1977), Schodde (1994), Schodde & Mason (1999), Serventy (1972), Sibley (1996), Sibley & Ahlquist (1990), Sibley & Monroe (1990), Sibley *et al.* (1988), Smith (1976, 1985a), Traylor (1979a).



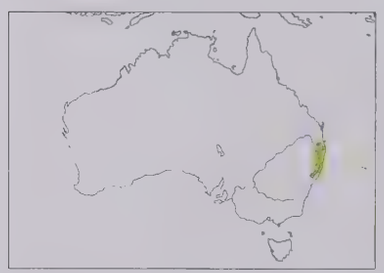
Genus *ATRICHORNIS* Stejneger, 1885

1. Rufous Scrub-bird

Atrichornis rufescens

French: Atrichorne roux **German**: Rostbauch-Dickichtvogel **Spanish**: Matorralero Rojizo
Other common names: Eastern Scrub-bird

Taxonomy. *Atrichia rufescens* E. P. Ramsay, 1867, Richmond River, New South Wales, Australia.
Birds from S Queensland (Macpherson Range) described as race *jacksoni*, but considered indistinguishable from nominate. Described taxon *tweedi* (from R Tweed, New South Wales) synonymized with nominate. Two subspecies recognized.
Subspecies and Distribution.
A. r. rufescens (E. P. Ramsay, 1867) - E side of Great Divide from extreme SE Queensland (Mistake Range) S to extreme N New South Wales (S to Gibraltar Range).
A. r. ferrieri Schodde & Mason, 1999 - NE New South Wales (from Dorrigo Plateau S to Barrington Tops).



Descriptive notes. 17-18·5 cm. Small and compact, with short wings, long, graduated tail. Male has head and neck dark brown with indistinct fine dark barring; rest of upperparts dark brown, also with fine dark barring, grading to dark rufous-brown on rump; tail and folded wing finely barred; blackish triangle (broadly tipped white in fresh plumage) from centre of chin to throat and breast and to side of upper belly, bordered by white malar stripe that extends as broken, narrower and much less conspicuous pale line to side of belly; sides of neck and breast and flanks buff-brown with fine barring; rest of belly and vent a rich buff, becoming rich rufous-brown with fine barring on undertail-coverts; large eye black or dark brown; short bill wedge-shaped, merging with flat head, upper mandible dusky to blackish with creamy tip, lower mandible cream-coloured; legs light greyish-pink. Female is smaller than male, with dark throat patch smaller and sometimes indistinct. Juvenile is more reddish-brown above with bars fainter, throat dull greyish, mostly uniform reddish-brown below, rear flanks faintly barred. Race *ferrieri* is slightly paler than nominate, dark area at side of lower breast smaller, belly slightly yellower, tarsus shorter.
Habitat. Subtropical and temperate rainforest, including beech (*Nothofagus*) forest, and adjacent eucalypt (*Eucalyptus*) forest with rainforest understorey. Occurs in wet gulleys, along watercourses, on ridges and escarpments of mountain ranges, in treefall areas. Confined to highland forests between 600 m and 1300 m.
Food and Feeding. Poorly known. Beetles, scrub-snails (*Helix*) and snail eggs recorded as taken; probably some plant seeds eaten. Forages on ground for small invertebrates; lifts leaves with the bill and head; scurries beneath leaf litter, using head as a shovel; scratches the ground to reveal prey.
Breeding. Poorly known. Season Sept-Nov. Male possibly polygynous, takes no part in nest-building, incubation or brood-rearing, occupies permanent territory of c. 1 ha or slightly larger. Nest a dome with side entrance, constructed from dead grasses such as *Xerotes*, *Gahnia* and *Carex*, sometimes some pieces of dead tree-fern incorporated, lined with cardboard-like substance made from wood fibre, placed close to ground, usually at c. 15 cm, in clump of sedges or tussock or small tree-fern. Clutch 2 eggs; incubation period uncertain, thought to be 36-38 days; nestling period not known, suggested as 3-4 weeks; young fed by mother for at least 3 weeks after leaving nest.
Movements. Sedentary. Although one immature travelled at least 20 km from nearest suitable breeding habitat, dispersal over such distances likely to be rare.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Eastern Australia EBA. Occurs in scattered populations along the Great Dividing Range. Total of 2400 territories estimated in 1984, only 730 of which were of nominate race; more recent surveys indicate that population has declined. Many of the surviving individuals are in national parks and are reasonably secure. Most of the lowland forest previously occupied by this species was cleared soon after European settlement, and it became confined to higher areas, mostly above 600 m. Remaining habitat not subject to clearance, but inappropriate burning and logging practices could potentially render it unsuitable.
Bibliography. Blakers *et al.* (1984), Boles & Tynan (1995), Brouwer & Garnett (1990), Chisholm (1921, 1951), Collar & Andrew (1988), Collar *et al.* (1994), Ekert (2000), Ferrier (1983, 1984, 1985), Fuller (2000), Garnett (1993), Garnett & Crowley (2000), Green & Hirons (1991), Greenway (1967), Higgins *et al.* (2001), Holmes (1987), Jackson (1911, 1920, 1921), King (1978/79), Lindsey (1992), Macdonald (1988), McAllan & Bruce (1989), Morcombe (2000), Pizzey & Knight (1997), Schodde (1996), Schodde & Mason (1999), Schodde & Tidemann (1986), Simpson & Day (1998), Slater (1978), Smith (1976, 1977), Stattersfield & Capper (2000), Trounson & Trounson (1987).

2. Noisy Scrub-bird

Atrichornis clamosus

French: Atrichorne bruyant **Spanish**: Matorralero Bullicioso
German: Braunbauch-Dickichtvogel
Other common names: Western Scrub-bird

Taxonomy. *Atrichia clamosa* Gould, 1844, Darling Range, Western Australia.
Proposed race *campbelli* (from King George Sound) considered indistinguishable. Monotypic.
Distribution. Western Australia, in coastal and near-coastal areas between Albany and Cheyne Beach; reintroduced at several sites, including recently near Waroona (in Darling Range, S of Perth). Introduced on Bald I.



Descriptive notes. Male c. 23 cm, 50-60 g; female c. 19·5 cm, 34 g. Rather small, with short rounded wings, long graduated tail. Male is mid-brown above, with fine, dark vermiculations on head, becoming broader barring on back and extending to tail; wings faintly barred (variable); chin white or off-white; broad dark band (with prominent white feather tips in fresh plumage) extends from centre of throat, sometimes from central chin, to upper breast, bordered by very broad white malar stripe; breast side dark greyish-brown; belly light buffish, flanks cinnamon with

dusky barring, becoming more rufous towards rear, ventral area deep rufous; large eye dark brown; upper mandible dark grey, central ridge extends (sometimes with small hump) into forehead feathers, lower mandible pinkish and curving markedly down at gape; legs light brown or greyish. Female is noticeably smaller than male, lacks dark throatband, chin creamy, generally more buff below, grading to rufous posteriorly. Juvenile is more uniform, dark rufous-brown, greyer posteriorly.

Habitat. Dense scrub and the shrubby understorey of low forest; frequents gulleys, swamps, watercourses, and dense thickets on sides of hills, often around rocky outcrops. Sometimes also found in dense low heath. From near sea-level to 500 m.

Food and Feeding. Eats a wide range of invertebrates, but seems to prefer ants (Formicidae), beetles, spiders, orthopterans and various larvae. Vertebrates sometimes taken; small frogs (e.g. *Crinia georgiana*), skinks (Scincidae) and geckos (e.g. *Phyllodactylus marmoratus*) recorded as fed to nestling. Forages mainly among deep leaf litter on the ground, also in rotting logs and debris and among stems and leaves of understorey plants. Pokes the bill into crevices and beneath leaves; lifts leaves with the head. Relies on flushing prey from litter and debris; does not scratch substrate.

Breeding. Season Apr-Oct, during austral winter, most eggs laid in Jun. Male probably polygynous, plays no role in nest-building, incubation of eggs or brood-rearing, occupies permanent territory of c. 5 ha. Nest dome-shaped, typically c. 18 cm high, 12·5 cm wide and 14 cm deep, with side entrance, constructed from grasses (mostly *Lepidosperma* and *Anarthria*, less commonly *Gahnia*, *Agonis*, *Dryandra*), inner layers quite tightly bound, outer layers looser, walls and floor up to 5 cm thick, bottom half of chamber lined with cardboard-like material made from wood pulp, often a small "hood" above entrance, usually also a loosely woven runway up to 20 cm long sloping up to entrance; typically c. 80 cm above ground, sometimes lower, and well hidden in clump of sedge or debris, occasionally in dense shrub or pile of debris. Clutch 1 egg; incubation period 5-6 weeks; chick brooded after each feed in early stages, daytime brooding ceases after c. 10 days but continues at night until fledging, chick fed with relatively large items (including small vertebrates) as it grows, female removes faecal sacs directly from cloaca of nestling; fledging period 3-4 weeks; after leaving nest, young remains close to its mother for up to 6 months. Success rates up to 90% in some populations; nests possibly preyed on by yellow-footed antechinus (*Antechinus flavipes*), possibly also by southern bush-rat (*Rattus fuscipes*). Female capable of breeding in first year, male at 2-3 years.

Movements. Generally sedentary. Some males disperse up to 10 km from natal area, but many appear to remain in or near natal territory until they establish a new territory or successfully challenge another territorial male.

Status and Conservation. VULNERABLE. CITES I. Restricted-range species: present in Southwest Australia EBA. Was considered extinct, but small population, of fewer than 100 individuals, rediscovered in 1961 at Mt Gardner, at Two Peoples Bay; latter area was soon thereafter designated a nature reserve. Was apparently reasonably common in 19th century, but by beginning of 20th century had become extremely rare; activities associated with European settlers (e.g. logging of forest, grazing by domestic stock, wholesale clearing of native vegetation for agriculture, and large-scale, intense wildfires) almost certainly responsible for the species' rapid decline. Over next 50 years, many comprehensive searches by ornithologists failed to find the scrub-bird, and it was believed to be extinct. Following its unexpected rediscovery in 1961, population at Two Peoples Bay increased steadily as a result of careful management, especially fire control, and from 1983 onwards individuals were captured there for reintroduction attempts elsewhere (after failure of captive-breeding programme in late 1970s); these were successful at four sites, and in 1990s resulted in major growth of the species' population. Total population estimated at 1900-2000 individuals in 2001, by which year birds translocated in 1983 and 1985 to Mt Manypeaks, E of Two Peoples Bay, had produced a subpopulation four times the size of original Mt Gardner one. Currently distributed along almost 50 km of coast, mostly in protected areas, and including introduced population on Bald I; locally common within this tiny range. Reintroduced at three sites near type locality in the Darling Range, S of Perth, at end of 1990s. Population of Albany management area increased from 588 singing males in 1999 to 765 in 2001, in spite of fires during 2000.

Bibliography. Anon. (2002c), Blakers *et al.* (1984), Bock (1985), Bock & Clench (1985), Brouwer & Garnett (1990), Burbidge & Jenkins (1984), Burbidge *et al.* (1986), Clench & Smith (1985), Collar & Andrew (1988), Collar *et al.* (1994), Danks (1991, 1993, 1997), Danks & Calver (1993), Danks *et al.* (1992), Davies *et al.* (1982), Fuller (2000), Garnett (1993), Garnett & Crowley (2000), Green & Hirons (1991), Greenway (1967), Higgins *et al.* (2001), King (1978/79), Knox & Walters (1994), Lindsey (1992), Macdonald (1988), Male (1995), Morcombe (2000), Morlion (1985), Palmer *et al.* (1991), Pizzey & Knight (1997), Raikow (1978), Robinson (1972), Schodde & Mason (1999), Schodde & Tidemann (1986), Serventy, D.L. (1962), Serventy, V. (1975), Shuker (1993), Simpson & Day (1998), Slater (1978), Smith (1977, 1985b, 1985c, 1985d, 1985e), Smith & Calver (1984), Smith & Danks (1994), Smith & Forrester (1981a, 1981b), Smith & Robinson (1976), Stattersfield & Capper (2000), Trounson & Trounson (1987), Tyler, M.J. (1979), Webster (1962), Woinarski (1998), Young (1983), Zusi (1985).

Class AVES
Order PASSERIFORMES
Suborder MENURAE
Family MENURIDAE (LYREBIRDS)



- Large, mainly ground-dwelling birds with short, rounded wings, long legs and a long tail.
- 76-103 cm.



- Eastern Australia.
- Mostly moist forest with dense understorey and some bare areas.
- 1 genus, 2 species, 4 taxa.
- 1 species threatened; none extinct since 1600.

Systematics

The scientists who examined the specimens of the Superb Lyrebird (*Menura novaehollandiae*) sent to England soon after the species' discovery by Europeans, in 1798, were puzzled as to the bird's affinities. This is reflected in the variety of common names ascribed to the species during the following fifty years, which included "Native Pheasant", "Peacock-wren" and "New South Wales Bird-of-paradise". One dominant early view was that lyrebirds belonged to the order Galliformes, but this had to be abandoned when the nesting habits and altricial development of the young menurids became better known.

The first evidence that *Menura* is, in fact, a passerine was published in 1840. Since then, two issues have dominated the debate concerning the affinities of the lyrebirds. These relate to the precise nature of their relationships with the other passerines, and to which of them they are most closely related. The suggestion that their closest relatives are the scrub-birds (Atrichornithidae) originated in the 1870s. In 1873, A. H. Garrod, on the basis of anatomical studies, concluded that the lyrebirds and the scrub-birds were closely allied, and he placed them next to the oscines, from which they differed in having fewer syringeal muscles. This treatment was followed by all authors for the ensuing century, with the two groups being placed in various taxonomic categories, but always distinct from all other passerines. From the mid-twentieth century, several authors placed the lyrebirds and scrub-birds between the suboscines and oscines in a separate suborder, Menurae, and this is the treatment followed herein.

In the years since the early 1980s, the conclusion that these two families are each other's closest relatives, but that neither is very closely related to any other passerine family, has been supported by documentation of similarities in body pterylosis and in the musculature of the fore and hind limbs, as well as by genetic analysis using the technique of DNA-DNA hybridization. Indeed, in 1990, the two groups were even united in a single family by C. G. Sibley and J. E. Ahlquist. On the other hand, further similarities that could be construed as indicating a close relationship, such as some features of the skull and skeleton, may be no more than shared passerine resemblances or may be the result of convergence towards a terrestrial lifestyle. The two families differ in traits such as wing and tail pterylosis, natal down and plumage-development patterns, and the DNA-DNA hybridization distances between them are actually quite large. Nevertheless, although there are currently no DNA-sequence data for scrub-birds, there is a general consensus that they are the lyrebirds' closest relatives.

Classification based on DNA-DNA hybridization grouped the lyrebirds, the scrub-birds, the Australasian treecreepers (Climacteridae) and the bowerbirds (Ptilonorynchidae) together in one superfamily. Subsequent analyses using protein electrophoresis and microcomplement fixation have not, however, supported this grouping. They constantly isolated the lyrebirds as a sister-lineage to the other oscine songbirds. This latter pattern of relationships has now been corroborated by recent DNA-sequencing studies examining both mitochondrial and nuclear genes. Although they have fewer intrinsic syringeal muscles than the 5-9 pairs typical of the oscines, it now seems that the lyrebirds may be most appropriately placed in the oscine suborder of the Passeriformes. It is certainly clear that they originated in the Australasian region.

The fossil record of the family is very poor. A single species, *Menura tyawanoides*, was described from the middle Miocene deposits at Riversleigh, situated at 19° S in the northern part of western Queensland.

Morphological Aspects

The two lyrebirds are primarily ground-dwelling birds, their flight being largely restricted to episodes of gliding downhill. They are among the very largest of the passerines, being of the same size as a *Phasianus* pheasant, and they have short, rounded wings. Albert's Lyrebird (*Menura alberti*) has a wingspan of 76-79 cm, that of the Superb Lyrebird being 68-76 cm. Both species have legs, feet and claws that are long, enabling them to run rapidly and to move litter and dig in the soil with considerable power. They move with a fairly upright stance, with the long tail held closed during terrestrial locomotion. In terms of plumage coloration, both are predominantly dark grey-brown or rufous-brown above and dark grey to light grey-brown below. The plumage of the adult Albert's Lyrebird is distinguished from that of the Superb Lyrebird by being generally more red-brown than grey-brown, especially on the throat, flanks and rump. Lyrebirds have a short, black, slender bill, a black iris and dark grey-brown legs and feet.

The most striking aspect of the Superb Lyrebird's plumage is the adult male's tail. When the bird is walking, this is carried in a horizontal train, with the feathers curving gently upwards and then drooping at the tip. In courtship display (see Breeding), by



The first thing one is likely to notice about lyrebirds is their size: they are amongst the largest of all passerines. Indeed, they look more closely related to pheasants than anything else, and thus their first taxonomic placement was in the order Galliformes. The second notable feature is the tail. Most of the time, when foraging, walking or perching, the tail of the male ***Superb Lyrebird*** *is held closed, as shown here. It consists of 16 highly modified feathers: an outer pair of broad lyre-shaped plumes (from which the species derive their English name), separated by twelve filamentaries with long, flexible barbs. These filamentaries mostly lack barbules, and as such they have a delicate lacy appearance. In this photograph, the outer plumes are partially concealed by filamentaries, but it is possible to make out the club-shaped, black tips and the series of chestnut-coloured, semi-transparent segments at intervals along the inner web. The tail of females is much less spectacular, lacking both lyrates and filamentaries, and appearing simply elongated. The wings of both sexes are brown, short and rounded, and are rarely used for flight.*

[*Menura novaehollandiae victoriae*, Healesville Sanctuary, Melbourne, Australia. Photo: D. Parer & E. Parer-Cook/Ardea]



*The male **Superb Lyrebird** is a famously accomplished songster, interspersing his loud vocal signal with a remarkable range of accurate mimicry. Apart from seven species-specific elements, the repertoire of each male contains a large number of sounds copied from a wide range of sources, such as birds, mammals (including humans) and machines. Males sing throughout the year, but in the breeding season their output increases so that half their time is spent singing. Females produce far less complex songs than males, and only sing under duress, such as when their nests are in danger.*

[*Menura novaehollandiae victoriae*, Healesville Sanctuary, Melbourne, Australia. Photo: Jürgen & Christine Sohns/FLPA]

contrast, the tail is fanned in a 180-degree arc, thrust forward over the back and head and vibrated. It consists of 16 highly modified feathers. The outer feather on each side is known as a lyrate; these feathers are curved in an S-shape, and together they resemble the frame of a lyre, from which the species derives its name. The two lyrates have club-shaped, black tips and a series of chestnut-coloured, semi-transparent bands at intervals along their length. Between the lyrates are twelve filamentaries with long, flexible barbs that mostly lack barbules, so that they have a lacy appearance. The two central median feathers are long and almost devoid of barbs and barbules, giving them a quill-like appearance. They curve upwards at the tip and cross over near their origins. The tail feathers are brown on the upper surface, but underneath they are silvery white, which greatly enhances the visual stimulus created when the tail is inverted in display.

Although the male Albert's Lyrebird also has an impressive tail, this is shorter and less spectacular than that of its congener. The lyrates are unornamented, and the filamentaries and medians are grey rather than white on the underside. The tail simply curves upwards when the bird is not displaying.

In both species, the female's tail is far less modified. Although the lyrates of the female Superb Lyrebird do have some chestnut notches, these are less pronounced than the prominent bands shown by the male.

Juvenile lyrebirds have a plumage similar to that of adult females, except that the rectrices are narrower and more tapered and the throat is more rufous. Male Superb Lyrebirds gradually acquire the characteristic adult tail over their first six to eight years, in a widely varying schedule; females acquire full adult plumage in about their fifth year.

Adult Superb Lyrebirds undergo a complete moult annually. After breeding, males moult all of their tail feathers over a period of 1-3 weeks in spring and early summer, and then replace them in about 14 weeks. Females undergo a more gradual annual replacement of the tail feathers. The primaries are replaced from the inner ones outwards, in spring. In both adults and immature birds, moult of the head and neck feathers occurs in summer and autumn and takes about a month; the body plumage is replaced over a more extended period lasting from spring to summer and even into winter.

Habitat

The family Menuridae is restricted to moist forest habitats in eastern Australia, where it ranges from extreme south-east Queensland southwards to the south-eastern half of Victoria. The discovery of the fossil species *Menura tyawanoides* in the Riversleigh deposits in north-west Queensland, near the border with Northern Territory, indicates that the family's range was probably more extensive in former times. The two extant lyrebirds are found from sea-level to about 1500 m, but they occur principally in the Great Dividing Range and associated mountains.

The Superb Lyrebird inhabits mainly rainforest and wet sclerophyll forest. In subtropical rainforest, it is commonly associated with watercourses where there is a dense understorey that includes ferns, shrubs, vines and epiphytes, but farther south it also inhabits cool temperate rainforest with a more open understorey. It is widespread in wet sclerophyll forests dominated by various eucalyptus (*Eucalyptus*) species, including mountain ash (*E. regnans*), alpine ash (*E. delegatensis*) and mountain gum (*E. dalrympleana*) at higher altitudes and narrow-leaved peppermint (*E. robertsonii*), brown barrell (*E. fastigata*) and manna gum (*E. viminalis*) at lower elevations. In north-eastern New South Wales and south-eastern Queensland, the species is also found in a quite different habitat type, that of dry sclerophyll forest with only a sparse understorey of hard-leaved shrubs interrupted by numerous granite boulders. In addition, it occurs in alpine snow gum (*E. pauciflora*) woodland and coastal eucalypt forests in which banksias (*Banksia*) are prominent. Superb Lyrebirds can live in logged forest, although not in the earliest regeneration stages, and they survive at low densities in forest remnants in cleared farmland. Between 1934 and 1949, this species was deliberately introduced to Tasmania, where it became established in temperate rainforest dominated by beech (*Nothofagus*) and in wet sclerophyll forest.

Albert's Lyrebird, which is distributed over a range of 100 km in south-east Queensland and north-east New South Wales, is confined to subtropical rainforest and wet sclerophyll forest with a very moist understorey of shrubs and vines. Like the Superb Lyrebird, it occurs both along watercourses and on the slopes and ridges of steep mountain ranges. Key factors promoting higher densities of this species are the presence of a eucalypt canopy, higher rainfall, lower temperatures, and more forest-floor litter.

Although lyrebird habitats typically have a dense understorey, the birds require areas of bare forest floor for foraging. Their foraging behaviour (see Food and Feeding) promotes the growth of shade-producing plants, and these help to keep such areas clear of ground cover and hence maintain an accessible food source. It is conceivable that lyrebirds prefer younger forests precisely because the higher tree density reduces ground cover. Equally, however, the males' display sites are commonly surrounded by quite dense vegetation, often resulting from a natural break in the canopy and greater light penetration. This may be important in providing displaying males with protection from predators. The nests of lyrebirds are built in steep-sided watercourses, as well as on slopes and ridges away from creeks.

General Habits

Although lyrebirds spend most of the day on the ground, they roost at night in trees, often 20-45 m above the ground. The ascent at dusk involves a series of clumsy leaps accompanied by wing-flapping, and the morning descent is made in a series of glides from branch to branch. Lyrebirds are normally extremely wary and unapproachable, this being especially true of Albert's Lyrebird, the ecology and behaviour of which are consequently poorly documented.

In the case of the Superb Lyrebird, two-thirds to three-quarters of the sightings made in one extensive investigation were of single individuals. Adults, in particular, are solitary throughout the year. Non-territorial, immature birds, however, often associate in small, single-sex and mixed-sex groups, which may be joined transiently by adults whose territories they traverse, especially in the non-breeding season. There is much social interaction, including display and chasing, within these groups, and the members sometimes roost together at night.

The agonistic behaviour of lyrebirds is aural and visual. Male territorial song seems both to attract mates and to repel rivals. Adult male Superb Lyrebirds also react to territorial intrusion by rival males with a "skypointing display", in which the neck is extended and the head is pointed almost vertically upwards and jerked from side to side. This is often followed by prolonged chasing accompanied by calling. "Full Display" (see Breeding) can form part of agonistic interactions among males, too. Such interactions sometimes escalate into fighting, in which the combatants strike each other with the bill and claws. Similarly, adult females sometimes threaten and fight one another quite vigorously.

When alarmed, lyrebirds commonly pause, visually scan their surroundings, listen and vocalize. Intense alarm stimulates piercingly loud whistles, immediately after which the birds either rapidly flee or seek cover and freeze. Various other reactions to potential danger in the vicinity of the nest are mentioned below (see Breeding).

Bathing is probably a daily activity for the Superb Lyrebird. This usually takes place in shallow streams and pools of water, the birds at times travelling long distances to reach them. After wading into the water, the lyrebird immerses its entire body, spreads its wings and ducks its head beneath the surface, while splashing about vigorously. It then leaves the water and jumps up to a perch, where it shakes the water droplets from its plumage and proceeds to preen, a process which includes the drawing of the entire length of each tail feather through the bill. Head-scratching is by the indirect method, with the foot brought over the top of the wing. In addition, the Superb Lyrebird preens at other times of the day, at favoured sites in its territory; indeed, it is claimed that it may indulge in up to eight bouts of preening daily. Members of groups of immatures often bathe together.

Lyrebirds make further use of pools and streams as sources of fresh water for drinking. They also drink from water trapped in hollows in logs, fungi and tree forks.

Voice

One characteristic for which the lyrebirds are renowned is their spectacular vocal behaviour, particularly the male's song with its large component of mimicry. Males sing at all times of the year,



*The bulk of the **Superb Lyrebird**'s diet is made up of adult and larval invertebrates, including earthworms, centipedes, cockroaches, beetles, earwigs and the like. In addition, a few small vertebrates are eaten, such as frogs and lizards. All these items are picked from the ground or from rotting bark and logs. The usual technique is to clear away leaf litter and dig into the soil with the powerful feet, to depths of up to 15 cm. Although individuals generally forage alone, they are often accompanied by smaller passerines, such as Pilotbirds* (Pycnoptilus floccosus)*, which are attracted to the insects disturbed by the lyrebird's diggings.*

[*Menura novaehollandiae*, Barrington Tops National Park, New South Wales, Australia. Photo: Roland Seitre]

but with maximum frequency and intensity during the peak period of the breeding season, in June-August. At this time, the diurnal singing rhythm exhibits early-morning and mid-afternoon peaks, although the midday decrease in vocal activity is less pronounced at the height of the egg-laying period. Each day during the main part of the breeding season, males spend more than four hours, over 50% of the daytime, in song, and they even sing at the roost before dawn and after dusk. Song is loud and complex, and it carries for 1 km or more under ideal conditions. Adult males respond to playback of song by approaching the amplifier and displaying aggressively, even if the recording is of their own song or of song from which all the species-specific elements have been removed.

The song of the male Superb Lyrebird consists of 70-80% mimicry interspersed with seven species-specific vocalizations, which include "Territorial Song", "Twanging", "Galloping" and "Clicking" calls. Bouts of song last from a few minutes to more than 40 minutes. Territorial Songs are evenly dispersed within song, last 6-10 seconds, and may themselves contain fragments of mimicked calls, such as the initial part of the Laughing Kookaburra's (*Dacelo novaeguineae*) laughing call or calls of the Yellow-tailed Black-cockatoo (*Calyptorhynchus funereus*). Males at a particular location often share several versions of Territorial Song, the shared repertoire being stable over at least a few years. There are, however, marked geographical dialects in Territorial Song, and many dialects may exist within a relatively small area if the lyrebird's populations are sufficiently acoustically isolated by habitat discontinuities or topography. The Twanging calls given in song sound like metal wires being struck, Galloping calls resemble the hoof sounds of a galloping horse, and Clicking comprises a series of soft clicks that may last for several minutes.

Most of the mimicry contained in the male Superb Lyrebird's song is of native and introduced birds. The preferred sounds are usually brief songs or call notes, or fragments of more complex songs. An individual's repertoire is extensive and can regularly include calls of twenty or more other bird species; collectively, up to 25% of the local avifauna may be mimicked by the males in a particular location. A few mammals, including the koala (*Phascolarctos cinereus*), the dingo (*Canis dingo*) and the common brush-tailed possum (*Trichosurus vulpecula*), are also mimicked. In addition, male Superb Lyrebirds mimic other natural sounds, such as the wingbeat noise of a flock of parrots (Psittacidae), the ripping of wood by feeding cockatoos or the creaking of a tree limb. The degree of control of timing in mimicry is remarkable. Males can, for example, imitate the antiphonal calling of a group of kookaburras or a pair of Eastern Whipbirds (*Psophodes olivaceus*). They also interrupt their own singing to mimic vocalizations produced concurrently by another species or another lyrebird and then resume where they left off, as though there had been no interruption. Spectrographic analysis shows that mimicked calls are in most cases very accurate representations of the model species' calls.

The degree of mimicry of man-made sounds by Superb Lyrebirds living in the wild has been exaggerated, and the phenomenon is, in fact, quite rare. Nevertheless, there are a few reasonably credible records of imitation of human whistles and speech fragments by wild individuals, as well as some authentic accounts of captive males mimicking sounds produced by vehicles, musical instruments and a camera motor drive.

Vocal mimicry by male Superb Lyrebirds also exhibits geographical dialects, the species mimicked reflecting variations in local avifaunas. Clearly, mimicry is for the most part learnt from other males in the population, rather than being directly copied from the model species. The best evidence for this is provided by the introduced Tasmanian populations of the Superb Lyrebird, which have retained for more than a generation their mimicry of mainland species that are absent from the island. As Tasmanian endemics were also being mimicked within twenty years of the introductions, however, some direct imitation of model species does occur. Young birds typically take a year or more to perfect their mimicked repertoire.

Males give a subdued version of song directly to females throughout the year. In this version, termed "Whisper Song", mimicry is more restricted and may include calls of bird species less commonly mimicked in the full song.

Compared with that of its congener, the song of the male Albert's Lyrebird has fewer species-specific components, the most prominent being Territorial Song and "Gronking Song". Each loud Territorial Song lasts up to ten seconds; as with the Superb Lyrebird, males at a given locality share several slightly different themes, the common repertoire is stable over many years, and there are regional dialects. Gronking Song commonly consists of repeated loud "gronk" notes, which are preceded by crackling and cracking sounds and succeeded by a series of soft, rhythmic notes. The remaining 70% of the song is pure mimicry, but with a smaller number of species mimicked than is the case with the Superb Lyrebird. Typically, three to eight co-existing bird species are mimicked, as also are some other natural sounds, but mimicry of the Satin Bowerbird (*Ptilonorynchus violaceus*) is dominant and even its local dialects are reproduced. In contrast to the Superb Lyrebird, Albert's Lyrebird utters mimicked sounds in a stereotyped order, rather than randomly. As with its southern congener, mimicry of domestic animals, tools and vehicles has been reported, and mimicry is probably culturally transmitted, because some species are mimicked in their complete absence. A degree of mimicry is also incorporated into both Territorial and Gronking Songs.

Females of both lyrebird species occasionally sing, although less "skilfully" than males. Their songs consist mostly of varied mimicry, lacking the species-specific elements of the males' songs, and they are generally given only in situations of danger or threat to the nest or young.

In addition to their famous songs, lyrebirds have several other vocalizations. These include high-pitched alarm whistles and guttural, clucking calls. In situations of intense alarm, as when a predator is close to the nest, the female utters an extremely loud, shrill shriek or scream.

Food and Feeding

Very little is known about the diet and foraging behaviour of Albert's Lyrebird. The following details, therefore, apply almost exclusively to the Superb Lyrebird. The principal food of this species is adult and larval invertebrates, which are obtained from the soil and from beneath bark on rotting vegetation. It occasionally captures invertebrates from litter trapped in epiphytes and tree forks.

Analyses of the stomach contents of adult Superb Lyrebirds have revealed the presence of a number of prominent dietary items. These are earthworms, woodlice (Isopoda), millipedes (Diplopoda), centipedes (Chilopoda), scorpions (Scorpiones), spiders, cockroaches (Blattodea) and their egg cases, both adult and larval beetles (Coleoptera), earwigs (Dermaptera), two-tailed bristletails (Diplura), fly larvae, bees, ants, and adult and larval moths. Prey eaten in smaller numbers include snails, the small terrestrial crustaceans known as amphipods and decapods, bugs (Hemiptera), stick-insects (Phasmatidae), small frogs, lizards of the family Scincidae, and the seeds of several plants. Adult and nestling diets strongly overlap. Additional prey items recorded as being fed to nestlings are the arthropod *Peripatus*, springtails (Collembola), crickets (Gryllidae) and grasshoppers (Acrididae), but more extensive sampling of the adult's diet may identify these items, too. The abundance of the soil invertebrates eaten by Superb Lyrebirds varies spatially and seasonally, being lowest in winter, when the birds start breeding, and higher in spring and, especially, autumn. The Superb Lyrebird has a slow passage rate of food through the gut, but assimilates energy from its diet very efficiently.

Superb Lyrebirds forage mainly on the ground and solitarily. In the summer and early autumn, they seek food more in the moist gulleys than on the drier slopes. They first clear away any litter or large, dead branches and then dig down into the soil, using both of their powerful, clawed feet, to depths of up to 15 cm. During steady, prolonged foraging bouts, their excavation sites are, on average, less than 2 m apart and 0·25-0·5 m^2 in area. Typically, a bird spends about 1·5 minutes at a site and



*The rarer of the two species, **Albert's Lyrebird**, inhabits a small range in the far south of Queensland and the far north of New South Wales. The males of this northern form are slightly smaller than their southern cousins, and the lyrate feathers in their tails are simpler in design. During the breeding season they construct a platform of twigs, raised just above the forest floor, and from this podium they sing and perform displays. In format, the displays of the two species are similar, differing only in the details of their execution. Likewise, Albert's Lyrebird is capable of copious loud singing and mimicry, although its voice is slightly less complex than that of the Superb Lyrebird, and the mimicry tends to be given in a more stereotypic, less random fashion.*

[*Menura alberti*, near Wilsons Peck, Queensland, Australia. Photo: Wayne Lawler/ Auscape]

catches 25-30 prey. About five digging movements are required for the capture of each prey item. Feeding is fairly unselective, the birds taking all suitably sized prey encountered. Foraging routes can be straight or very circuitous, although the bird rarely retraces its steps during any single bout of foraging. By burying leaf litter beneath the soil when foraging, lyrebirds probably hasten its breakdown and speed up nutrient-cycling in the forest. Various other birds, including Pilotbirds (*Pycnoptilus floccosus*), Eastern Yellow Robins (*Eopsaltria australis*) and White-browed Scrubwrens (*Sericornis frontalis*), sometimes accompany foraging Superb Lyrebirds, exploiting flushed prey that the lyrebird misses.

From the few data available, it appears that the feeding behaviour of Albert's Lyrebird is similar to that of its congener. Its diet is very poorly known, but seems to consist mainly of adult and larval insects and other soil-dwelling invertebrates. Despite the paucity of information, it is perhaps rather surprising that earthworms have not been confirmed as being eaten by Albert's Lyrebirds. Although a female was seen to take earthworms that had been placed out for her, she fed these to her nestling, rather than consuming them herself.

Albert's Lyrebird generally forages singly, and in relatively open areas lacking dense shrub cover. It scratches through litter and other ground debris, and has been observed to dig into the soil to a depth of 5 cm with its powerful legs and feet. A most intriguing observation, however, was made in September 2001, on the Lamington Plateau, in Queensland. In the early hours of the morning, R. H. Loyn and J. A. Loyn watched a male Albert's Lyrebird as it sat quietly about 8 m above the ground on the base of an epiphytic bird's-nest fern (*Asplenium australasicum*). The bird began to scratch vigorously and to peck at what was presumed to be invertebrate prey; after a few minutes, it flew to the base of another epiphytic fern some 10 m up in a nearby tree, where it repeated the behaviour. A pair of Eastern Yellow Robins quickly took its place on the first fern. From subsequent enquiries made by the observers, it appears that Albert's Lyrebirds have been seen to forage in the same way by other reliable ornithologists. Epiphytic ferns, which are abundant in the rainforest of the region, trap substantial quantities of dead leaf litter and other debris before it reaches the ground. Loyn and Loyn speculated that, as many birds compete for food on the forest floor, a species could gain an advantage by exploiting a different substrate in the subcanopy. A good deal of additional field study is required, however, before one could determine to what extent, if any, this may apply to Albert's Lyrebird.

Interestingly, there is a similar record for the Superb Lyrebird, a species which is far less restricted to rainforest. An individual was seen to forage almost 5 m above the ground in a messmate (*Eucalyptus obliqua*), where it scratched in debris which had collected where two large branches joined the trunk.



*This male **Superb Lyrebird** is busy on one of its dancing grounds, vocalizing with gusto and performing its spectacular courtship display. During the full version of this display the tail is fanned out into a 180° arc, and spread over the head like an umbrella. The filamentous plumes are vibrated rapidly to accentuate the visual effect, and, as if this shimmering veil were not quite impressive enough, he hops from side to side, and leaps several times into the air. This expert choreography is set against a vocal accompaniment impressive in its power and variety. Taken as a whole, the performance is one of the most extraordinary examples of sexual selection and exaggerated courtship ritual in birds.*

[*Menura novaehollandiae edwardi*,
Washpool National Park,
New South Wales,
Australia.
Photos: Günter Ziesler]

Breeding

Breeding begins in the austral winter, generally in June, and ends in early November, but nest-building can commence in the autumn, sometimes as early as March.

Female Superb Lyrebirds first breed when they are 5-6 years old, with males starting at 6-8 years of age. As adults can live for 20-30 years, and as females nest once every year, they potentially have the opportunity to make up to about 25 breeding attempts in their lifetime.

During the breeding season, adult Superb Lyrebirds are solitary and the two sexes defend separate all-purpose territories. A male's territory can encompass, either wholly or partly, those of up to six females, and the boundaries with neighbouring males' territories are narrow zones, rather than abrupt lines. The typical size of a male territory varies among areas, but 2·5-5 ha is the common size range. Each adult male constructs within his territory 20-83 display sites. These are bare, slightly domed, earth mounds measuring 1-2 m in diameter and on which males perform courtship display, especially from June to September. Females visit these mounds for the purpose of copulation.

The male Superb Lyrebird's spectacular courtship display centres on his modified tail (see Morphological Aspects) and his remarkable vocal ability (see Voice). The tail is an extravagant trait that is thought to have evolved through intersexual selection. When a female approaches the mound, the male first gives clicking calls and then performs an "Invitation Display", in which the tail, which is kept folded, is thrust forward, held horizontally



While Albert's Lyrebird (Menura alberti) *builds a stage of sticks on which to dance, the* ***Superb Lyrebird*** *scrapes away leaf litter and digs earth to form a bare, raised mound. Each male constructs large numbers (20-83) of display mounds on his territory, and circulates around these, trying to attract females. When females visit, males display in frenzied fashion until the female consents to copulate, or moves off to assess another male. Males can copulate with several females in a breeding season, but in each case they play no further role in raising the offspring. The female builds the nest, incubates the egg, and raises the fledgling alone.*

[*Menura novaehollandiae victoriae*, Sherbrooke Forest, Victoria, Australia. Photo: Hans & Judy Beste/Ardea]

over the head and back and vibrated rapidly. This is followed by Full Display, in which the tail is fully fanned so that it forms a lacy curtain of about 1·5 m^2 around the male's head and the front of his body. The tail is vibrated as the male first moves from side to side with short, rapid steps and then, with his wings held loosely at the sides, jumps in the air several times. The performance is accompanied by some striking calls and song containing much mimicry (see Voice).

Copulation takes place on a mound after lengthy bouts of male display. Male Superb Lyrebirds appear to be promiscuous, and in the course of a single breeding season they will copulate with several females without forming durable bonds with any of them. Females, when choosing a mate, sometimes visit more than one male and may temporarily leave their territory in doing so. The mating system of the species can be characterized as dispersed male-dominance polygyny, and the males take no part in the building of the nest, the incubating of the eggs and the rearing of the young.

Male Albert's Lyrebirds are also territorial. They, too, perform courtship displays, but on platforms of vines and twigs lying on or just above the forest floor. They scratch the soil beneath the platform a little, but do not build mounds. In the initial phase of courtship, the male holds his tail more open than does the Superb Lyrebird, and he sways from side to side. Full Display closely resembles that of the Superb Lyrebird, the fully open, fanned tail forming a shimmering curtain over the bird's head and body as he executes a high-stepping dance. Courtship display is accompanied by loud singing, which includes interspecific mimicry (see Voice), and the vegetation surrounding the platform often vibrates, possibly as a result of direct manipulation by the male. Copulation probably takes place on the platform. The mating system of Albert's Lyrebird is unknown, but probably resembles that of the species' southern relative.

Lyrebirds' nests, sited in steep-sided watercourses or on slopes and ridges, are bulky and enclosed, with a side entrance that sometimes has an access ramp. The base of the nest comprises a platform or cradle of sticks, and the walls and roof are made from rootlets, small twigs, bark, fern fronds, plant fibre, leaves and moss. The lining consists of fine plant materials and body feathers, which the female is thought to pluck from her own plumage. Sometimes, a sprig of green vegetation is placed on the roof. The completed nest of the Superb Lyrebird weighs 14 kg and takes up to 160 hours to build, the construction work being spread over a period ranging from less than one month to several months. Most lyrebird nests are on the ground or within 2 m of it, but some are situated at heights of up to 20 m or more in trees. Nest-sites include the base of trees, earth banks, boulders, rock faces, fissures and crotches of living and dead trees, clumps of wiregrass (*Tetrarrhena*) or sword-sedge (*Lepidosperma*), exposed tree roots and fallen trunks. For the Superb Lyrebird, the site and the height of the nest do not seem to influence nesting success.

Most female lyrebirds lay between June and August, the clutch consisting of a single egg. Occasional records of two-egg clutches are probably the result of replacement laying, rather than constituting a genuinely larger clutch size. The majority of females, however, make only one breeding attempt annually, even if this fails quite early on. The oval egg has a grey or brown background colour, and irregular dark grey or brown markings over much of the shell. It is approximately the size of a chicken's egg, and that of the Superb Lyrebird weighs about 62 g, on average.

The reproductive cycle of lyrebirds, from egg-laying to the time when the young leave the nest, is unusually protracted. Although many of the relevant details for Albert's Lyrebird are poorly known, they are probably very like those of its relative. The incubation period of the Superb Lyrebird is about 50 days, which is 70-80% longer than would be predicted on the basis of the size of the bird and that of its egg. This surprisingly long period may be partly due to the fact that the female spends less than 50% of the daytime in incubating; in particular, she usually takes two recesses daily, the first of which generally lasts for 3-6 hours. The maximum daily ambient temperature at this time is usually below 10°C, and so, during the long recess, the embryo cools down over about three hours to a level close to ambient temperature, and remains at this level until the female returns.

Because these temperatures are below physiological zero temperature, embryonic growth is effectively suspended for several hours every day and development is consequently protracted. The extended incubation period does not, however, result in the egg losing more water than would be needed to facilitate effective hatching. This is because the porosity of the shell is comparatively low.

Once it has hatched, the Superb Lyrebird nestling also grows at an unusually slow rate. The nestling period lasts for about 47 days, rather than the 29 days predicted allometrically from adult body mass. Again, exposure to low temperatures when the female is not brooding the chick in the early stage of development, before it is endothermic, could be a contributing factor. The low feeding frequency, with respective averages of 16 and 32 feeds daily in the early and late stages in the chick's development, may also be involved. It is not known, however, whether the evolution of the female's brooding and provisioning regimes was shaped by the slow growth of the chick or whether the reverse is the case. The mother carries food to the nestling in her cheek pouches, and each meal comprises, on average, 44 prey items, with a total energy content of about 9 kJ. With this feeding regime, the nestling typically increases from 5% of the adult female's weight to 63% during its development. The female deposits most of her nestling's faecal sacs in a nearby stream or buries them in the soil.

Fledgling care is similarly very protracted, and may commonly last for 8-9 months. The fledgling is fed by its mother about 3·5 times as often as it was in the late stage of the nestling period, but the meals are now much smaller. When the adult females commence nest-building, they are sometimes still accompanied by their offspring from the previous year; successful breeding can, therefore, involve more than one year's commitment.

Incubating females usually flee silently when a human approaches the nest, but during the nestling stage the females show a variety of responses to the presence of a predator or a human in the vicinity of the nest. These include tail display, quiet song incorporating interspecific mimicry, running around while giving alarm calls, and physical attacks on the intruder. Older nestlings often respond to humans by standing, bracing themselves against the back or roof of the nest, and emitting ear-shattering screams that usually attract the mother if she is absent from the nest. Animals that evoke anti-predator behaviour, especially if they are near the nest, include foxes, snakes, kookaburras, ravens (*Corvus*) and various raptors.

The few published estimates of nesting success for the Superb Lyrebird vary from 11-20% to 64%. Some of this variation stems from differences in methods of estimating success. Predation is the main cause of nestling mortality; exotic mammals are strongly implicated in this, but native birds, such as ravens and currawongs (*Strepera*), are probably also involved.

It is likely that the single offspring's slow development is crucial in permitting effective single parenting by the mother and facilitating male parental emancipation and polygyny. Breeding during the winter months is an uncommon phenomenon among Australian birds. In the lyrebirds, it has probably evolved as a consequence of male parental emancipation and single-parent brood care by females, rather than being a selection pressure favouring those behavioural traits.

Movements

Studies of individually recognizable birds, combined with the temporal stability of song types (see Voice), indicate that Superb Lyrebirds are sedentary in all parts of their range. Adults are territorial throughout the year, although territory boundaries are relaxed a little in the non-breeding season, during which some short local movements may be undertaken. Young immature birds are not territorial and move over a much larger area. Natural dispersal is usually over distances of less than 10 km. Superb Lyrebirds will, however, flee considerable distances from bush fires, often unsuccessfully (see also Status and Conservation).

The Superb Lyrebird's weak powers of flight and its sedentary nature may partially account for its slow rate of range expansion in Tasmania. Since its introduction there in the 1930s and 1940s (see Habitat), its spread has averaged only about 1 km annually and may have been particularly slow until the late 1980s.

Knowledge of the movements of Albert's Lyrebird is negligible, but the species is thought to be sedentary. Nevertheless, some post-breeding dispersal over short distances seems possible.

Relationship with Man

Aboriginal people appear not to have hunted lyrebirds to any significant extent, and these birds, unlike many other native animals, do not feature greatly in their rock paintings. Even so, indigenous Australians were obviously familiar with the Superb Lyrebird's vocal ability. Of the many names given to the species by aboriginal tribes, "Beleck-Beleck", "Buln-Buln" and "Bullan-Bullan" are clearly phonetic renditions of its calls.

The Superb Lyrebird first became known to Europeans in 1797. A former convict, John Wilson, who had been living with aboriginal people for some years, surrendered to the colonial authorities of New South Wales clad only in a kangaroo-skin apron, and he reported the existence in "the bush" of a strange, pheasant-like bird. In the following year, John Price, a young servant of the colony's governor, collected the first specimen of this bird, in the Blue Mountains. The species was initially referred to as *Menura superba*, which probably meant "the superb bird with the crescent-moon tail" and alluded to the transparent notches in the adult male's tail. Early confusion with regard to the bird's systematic affinities (see Systematics) resulted in its being given many different vernacular names. Ironically, the one that persisted, lyrebird, was given to it by some of the English scientists who examined the early specimens, and who believed that the male's remarkable tail was held in the shape of a lyre throughout display, rather than, as is in fact the case, momentarily.

In the late 1800s and early 1900s, the tail feathers of Superb Lyrebirds became fashionable as household ornaments in the cities of eastern Australia and overseas. As a result, the birds were killed in great numbers (see Status and Conservation).

Albert's Lyrebird was "discovered" by Europeans in the mid-1800s and named after the reigning monarch's consort, Prince Albert. It, too, was hunted for trophies and meat in the early years after its discovery, but to a lesser extent than was its southern congener.

Fortunately, attitudes towards lyrebirds are now dramatically different, and the Superb Lyrebird, in particular, has achieved an almost iconic status in Australia. Most of the pioneering research on this species was conducted in Sherbrooke Forest, in outer Melbourne, where some of these long-lived, normally shy birds have become so accustomed to people that they can be approached and followed at close quarters for long periods of time. The Superb Lyrebird's song was first broadcast from this location to a national audience in 1931, and subsequent gramophone, video and television material has emanated mainly from this site, too. The bird has appeared on postage stamps and is featured on the current Australian ten-cent coin. Its courtship display and song have inspired a ballet, Sir Robert Helpman's "The Lyrebird", as well as passages in the music of the French composer Olivier Messiaen, whose "Saint François d'Assise" and "Eclairs sur L'Au-Delà" incorporate some of the Superb Lyrebird's remarkable vocalizations.

Status and Conservation

Albert's Lyrebird was considered by BirdLife International to be Near-threatened in the early 1990s. Just a few years later, however, in an important publication in 2000, S. T. Garnett and G. M. Crowley estimated that only 3500 breeding adults of this species remained. With a total population consisting of fewer than 10,000 individuals, and the possibility that its numbers might decrease by 10% over the following three decades, Albert's Lyrebird was officially listed as Vulnerable. The Superb Lyrebird, on the other



*The female **Albert's Lyrebird** builds a bulky, domed nest, and into it she deposits a single egg. This egg probably takes well over a month to hatch, after which the nestling grows very slowly: it takes at least 39 days to fledge, and it stays with the female until it is several months old. The population of breeding adults in this species has been reduced to 3500 individuals. As a result of intensive forestry practices, and the replacement of diverse natural forests with eucalyptus or pine monocultures, the population is still declining. However, despite being considered Vulnerable to extinction, many remnant populations of Albert's Lyrebird survive in reserves, and thus their future is relatively secure.*

[*Menura alberti*, Tamborine Mountain, Queensland, Australia. Photo: Lloyd Nielsen/ Oxford Scientific Films]

hand, is currently believed not to be at any risk, and it is still quite common in suitable habitat throughout much of its range.

Historically, both species have been adversely affected by the clearance of habitat for agriculture, forestry and settlement. They do, however, have some ability to survive in harvested forest in which logging events are sufficiently well spaced temporally, and where clearance does not lead to intense invasion by exotic and native ground-cover plants that inhibit feeding. Much of the habitat occupied by Albert's Lyrebird was cleared in the nineteenth century, and suitable habitat for the Superb Lyrebird, too, has been greatly reduced in the last 150 years.

During the nineteenth century and the early decades of the twentieth century, lyrebirds were killed in large numbers by colonists from Europe. Some were hunted for the purpose of providing food, but the great majority were shot for their magnificent tail feathers, which became prized ornaments. The Superb Lyrebird was the main target of the trophy-hunters. In the early 1900s, in one district alone, over 400 were killed in one season, and in Sydney, over a three-year period, two dealers are known to have exported at least 3000 tails of the species. In England, tail plumes were openly sold in London during this period. Adding to these pressures, this lyrebird's eggs were also collected by oologists in considerable numbers in the late nineteenth century. The Superb Lyrebird was accorded full legislative protection in Victoria in 1887, in New South Wales in the early 1900s and in Queensland in 1922, although the fines imposed for breaking the Queensland Act were insignificant. Albert's Lyrebird was also hunted, but on a smaller scale.

At present, the main potential threat to Albert's Lyrebird is intensive forestry practices. Regrowth after logging in wet sclerophyll forest results in increased transpiration, reduced soil moisture and a reduced rainforest subcanopy, as well as an increase in ground cover, often through invasion by lantana (*Lantana camara*). These conditions diminish food availability and accessibility for the birds. Complete replacement of optimal forest habitat by eucalyptus and pine plantations, which are capable of supporting only low densities of lyrebirds, is even more detrimental. Many of the remaining subpopulations of Albert's Lyrebird are fairly secure in reserves, although some may be susceptible to the stochastic and genetic effects to which small populations of animal species are prone.

Habitat loss and alteration are probably the main threats to the Superb Lyrebird, too. Quite a few populations of this species are not presently protected in reserves, and the risk of further deterioration or destruction of native forest is ever present.

In very dry years, bush fires can also represent a threat to lyrebirds. There are several recorded observations of individuals seeking shelter in sites where humans had also sought refuge from the flames and smoke. In addition, both adults and nestlings not infrequently fall victim to predation by mammals, although the extent to which Albert's Lyrebird is preyed upon has been questioned. Predation can, however, have a significant impact on the Superb Lyrebird. Several authors have attributed the decline of this species recorded in Sherbrooke Forest largely to mammalian predation and to increasing urbanization of nearby areas. The mammal species involved are cats and dogs, including dingos, and foxes, but it is unclear whether the impact of these predators exceeds that originally exerted by the native carnivores, such as quolls (*Dasyurus*), which they have displaced.

Lyrebirds fit one classic profile of vulnerable species. They have low reproductive and recruitment rates and they need a lot of habitat in order to satisfy their resource requirements.

General Bibliography

Ames (1971), Barker & Vestjens (1990), Boles (1995), Browning & Monroe (1991), Campbell (1941), Chisholm (1960), Christidis & Boles (1994), Christidis & Schodde (1991), Christidis *et al.* (1996), Clench (1985), Curtis (1998), Edwards (1919), Ericson, Christidis, Cooper *et al.* (2002), Ericson, Christidis, Irestedt & Norman (2002), Ericson *et al.* (2003), Espinosa & Cracraft (1994), Feduccia (1975), Feduccia & Olson (1982), Halafoff (1961), Higgins *et al.* (2001), Irestedt *et al.* (2001), Kaplan & Sridhara (1999), Keast (1972), Leach (1929), Lill (1979a, 1979b, 1985, 1986), Lindsey (1992, 1994), Littlejohns (1926), Macdonald (1988), Møller (1996b), Pratt (1933), Raikow (1978, 1985), Reilly (1988), Rich *et al.* (1985), Robinson (1975), Robinson & Curtis (1996), Schodde & Mason (1999), Serventy (1972), Sibley (1970, 1974, 1976a, 1976b, 1996), Sibley & Ahlquist (1985a, 1990), Sibley & Monroe (1990), Sibley *et al.* (1988), Smith (1976), Traylor (1979a), Tregallas (1921, 1931).



Genus *MENURA* Latham, 1802

1. Albert's Lyrebird

Menura alberti

French: Ménure d'Albert **German**: Braunrücken-Leierschwanz **Spanish**: Ave-lira de Alberto
Other common names: Prince Albert('s) Lyrebird, Northern Lyrebird

Taxonomy. *Menura alberti* Bonaparte, 1850, Turanga Creek, Richmond River, New South Wales, Australia. Described race *rufa*, from S Queensland, considered undiagnosable. Monotypic.
Distribution. Extreme SE Queensland and extreme NE New South Wales, Australia.
Descriptive notes. 86-93 cm; c. 930 g. Large, with long legs, big strongly clawed feet, and train-like tail. Male has dark grey head and neck, mainly dark red-brown to rufous-brown upperbody and wings; tail 47-57 cm long, comprises ribbon-like central pair of feathers, 12 lacy filamentaries, and a broad outermost pair (lyrates), dark brown above and dark grey below; rufous-brown chin, throat and foreneck, dark grey breast, paler grey abdomen; rear flanks and undertail-coverts bright rufous-brown; bill black; iris dark brown to black, grey orbital ring; legs and feet brownish-grey. Differs from *M. novaehollandiae* in smaller size, more rufous plumage, simpler lyrates. Female is like male, but tail shorter (36-42 cm) and simpler. Juvenile resembles adult female, but rufous coloration brighter, upperparts paler, and rectrices mostly narrower, tapered and pointed; immature as adult female, probably acquires adult tail gradually over several years.



Habitat. Mainly subtropical montane rainforest and wet sclerophyll forest with dense, mesic understorey of shrubs and vines; also inhabits some moderately mature regrowth forest with limited ground cover.

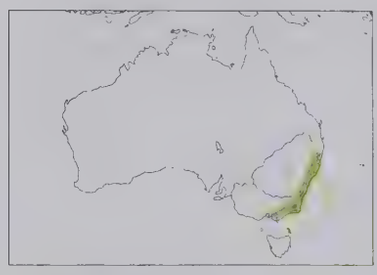
Occurs in gulleys, along watercourses, and on slopes and ridges of steep mountain ranges, mainly above 300 m. Density highest where there is a eucalyptus (*Eucalyptus*) canopy, and increases with increasing rainfall and amount of forest-floor litter and decreasing mean annual temperatures. Absent or at low densities in eucalyptus or pine (*Pinus*) plantations, and absent from dry sclerophyll forest.
Food and Feeding. Very little known. Thought to consume mainly adult and larval insects and other soil invertebrates; diet probably similar to that of *M. novaehollandiae*. Female once seen to feed earthworms to nestling, rather than eating them herself. Forages mostly solitarily, on ground in rather open areas lacking dense shrub cover; scratches through litter, and digs into soil to depths of 5 cm, using powerful legs and feet. Has occasionally been observed to forage above ground, at up to 10 m, in debris trapped in subcanopy epiphytes, e.g. bird's-nest fern (*Asplenium australasicum*).
Breeding. Poorly known. Laying in May-Aug. Mating system unknown; arena behaviour, male sings and displays, raising fanned tail over body and head and dancing, solitarily on terrestrial platform of sticks and vines, copulation probably mainly on platform; nest-building and all subsequent duties by female alone. Bulky nest domed, with side entrance, made from sticks, fronds, leaves and rootlets, lined with moss, fine plant material and feathers; placed mainly on rock face or on the ground, often at tree base, sometimes in tree fork; male territory 5-15 ha, female probably also territorial. Clutch 1 egg; incubation period unknown; nestling period c. 39 days. Longest-lived individual more than 20 years old.
Movements. Poorly documented. Sedentary, both sexes resident in same general area throughout year; possibly move short distances outside territories in non-breeding season. Known to cross small gaps to reach isolated rainforest patches.
Status and Conservation. VULNERABLE. Restricted-range species: present in Eastern Australia EBA. Global population estimated at no more than 3500 mature adults, and thought to be declining. Density in optimal habitat c. 5 "pairs"/km². In 19th century much habitat cleared for agriculture, forestry and settlement, resulting in contraction of range and decrease in numbers. Many subpopulations now found in national parks and other reserves, where fairly secure, but some possibly susceptible to adverse effects that afflict small populations (e.g. genetic inbreeding). Main current potential threat is intense forestry management, especially replacement of optimal habitat by eucalyptus and pine plantations, which support only low densities of lyrebirds.
Bibliography. Beruldsen (1973), Blakers *et al.* (1984), Brouwer & Garnett (1990), Chisholm (1957), Collar *et al.* (1994), Curtis (1972, 1998), Garnett & Crowley (2000), Gould (1853), Higgins *et al.* (2001), Holmes (1987), Lindsey (1992, 1994), Loyn & Loyn (2002), Macdonald (1969, 1988), McAllan & Bruce (1989), Morcombe (2000), Nielsen (1959, 1960), Pizzey & Knight (1997), Ramesh *et al.* (1988), Roberts (1979), Robinson (1975, 1977), Schodde (1996), Schodde & Mason (1999), Schodde & Tidemann (1986), Simpson & Day (1998), Smith (1968), Stattersfield & Capper (2000), Steinbacher (1998), Trounson & Trounson (1987).

2. Superb Lyrebird

Menura novaehollandiae

French: Ménure superbe **German**: Graurücken-Leierschwanz **Spanish**: Ave-lira Soberbia
Other common names: (Prince) Edward Lyrebird, (Queen) Victoria Lyrebird, New South Wales Bird-of-paradise

Taxonomy. *Menura novaehollandiae* Latham, 1802, upper Nepean River, New South Wales, Australia. Was in the past sometimes referred to as *M. superba*, but that name invalid. Race *victoriae* formerly synonymized with nominate. Three subspecies recognized.
Subspecies and Distribution.
M. n. edwardi Chisholm, 1921 - extreme SE Queensland (Stanthorpe-Killarney region) and NE New South Wales (S, on and E of Great Dividing Range, to R Hunter).
M. n. novaehollandiae Latham, 1802 - SE New South Wales from R Hunter S (on and E of Great Dividing Range) to Victoria border (E of Monaro Tablelands).
M. n. victoriae Gould, 1865 - Australian Capital Territory (Brindabella Range) and extreme SE New South Wales W of Monaro Tablelands, S to E Victoria (S to Dandenong-Strathbogie Ranges and to NE coast).
Introduced (*victoriae*) to Tasmania.
Descriptive notes. Male c. 103 cm, 1100 g; female 76-80 cm, 890 g. Large, with long legs, big strongly clawed feet, and long, train-like tail. Male nominate race has dark grey to brownish-grey upperparts, dull red-brown wash on greater coverts and wings; tail 54-71 cm long, comprises wire-like central pair of feathers, 12 lacy filamentaries, and broad outermost pair (lyrates) with tooth-comb pattern and black club-shaped tip, dark brown above and mostly silvery white below; underparts dark to light brownish-grey, undertail-coverts browner; bill black; iris black, grey orbital ring; legs and feet dark grey. Differs from *M. alberti* in larger size, less rufous plumage, longer tail with more elaborate lyrates. Female is like male, but tail shorter (25-41 cm) and simpler. Juvenile is like adult female, but forehead, chin and foreneck rufous to red-brown, lyrates shorter, narrower and pointed at tip; gradually loses rufous coloration and develops adult tail over several years. Race *edwardi* is generally lighter and greyer than nominate, lyrates slightly less curved; *victoriae* has head, neck and mantle darker, wings slightly darker.



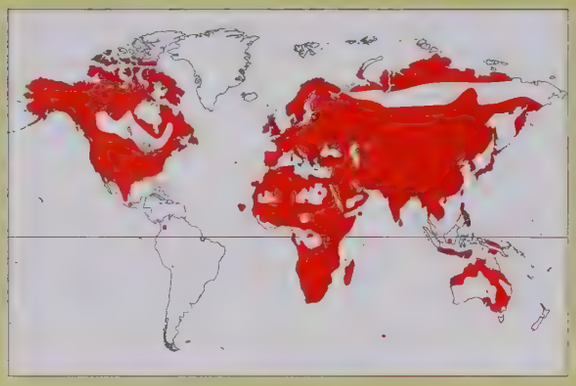
Habitat. Mainly moist forest, particularly cool temperate and subtropical rainforest and wet sclerophyll forest, from sea-level to subalpine zone. Inhabits gulleys, valleys, mid-slopes and ridges; needs bare ground for feeding. In subtropical rainforest, usually associated with dense understorey of ferns, shrubs, vines and epiphytes; in cool temperate rainforest, in areas with more open understorey. Widespread in wet sclerophyll forest with various eucalyptus (*Eucalyptus*) species forming canopy, also in alpine snow gum woodland and coastal eucalypt forest where banksias (*Banksia*) prominent. In Tasmania, introduced population (*victoriae*) now established in temperate beech (*Nothofagus*) forest and wet sclerophyll forest. N populations (*edwardi*) confined to dry sclerophyll forest with sparse understorey of hard-leaved shrubs interrupted by numerous granite boulders.
Food and Feeding. Eats mainly adult and immature invertebrates obtained from soil and under bark; occasionally takes small vertebrates and seeds. Common prey include earthworms, woodlice (Isopoda), millipedes (Diplopoda), centipedes (Chilopoda), scorpions (Scorpiones), spiders, cockroaches (Blattodea), beetles, earwigs (Dermaptera), diplurans, fly larvae, bees, ants and moths; less frequent items include amphipods and decapods, bugs (Hemiptera), stick-insects (Phasmatidae), snails, small frogs, skinks (Scincidae). Additional prey items recorded in nestling diet are the arthropod *Peripatus*, springtails (Collembola), crickets (Gryllidae), grasshoppers (Acrididae). Forages mostly solitarily, on ground; foraging routes straight or winding. Digs in soil to depths of 15 cm, uses powerful feet to rip bark from rotting logs, taking any suitably sized prey encountered. On average, excavation sites used during steady foraging up to 2 m apart, each yielding 25-30 prey items. Prey disturbed by its activity are exploited by other passerines. Foraging thought to play key role in nutrient-cycling and vegetation regeneration. An individual once seen to forage almost 5 m up in a messmate (*Eucalyptus obliqua*), where it scratched in debris trapped where two large branches joined trunk.
Breeding. Laying in Jun-Aug. Male solitary, promiscuous, exhibits arena behaviour, performs courtship with much vocal mimicry on earth mound, tail thrust forward horizontally over head and back and vibrated rapidly, with side-to-side stepping and vertical jumps; copulation on mound, female may visit several males pre-mating; nest-building and all parental care solely by female. Nest bulky, domed, with side entrance, made from sticks, rootlets, twigs, bark, fern fronds, plant fibre, leaves and moss, lined with fine plant materials and body feathers; placed mostly on or within 2 m of ground, sometimes at up to 20 m in tree, main sites include base of tree, earth bank, boulders, rock face, and fissure or crotch of living or dead tree; male territory typically 2·5-5 ha, female territory smaller. Clutch 1 egg; incubation 50 days; nestling period 47 days; independence at 8-9 months after fledging. Success variable, c. 11% to 64%; predation main cause of breeding failure. Female first breeding at 5-6 years, male at 6-8 years. Oldest identifiable individual 25-26 years.
Movements. Sedentary; adults relax territorial boundaries a little in non-breeding season. Young immatures not territorial, move over larger area, often gregariously. Natural dispersal usually less than 10 km. Flees considerable distances from bush fires.
Status and Conservation. Not globally threatened. Formerly hunted, now fully protected. Many mainland populations probably declined in 20th century. Still common in suitable habitat; densities 0·1-0·5 birds/ha. Habitat reduced and degraded by forestry, agriculture and settlement; able to live in forest remnants in farmland, also in logged forest if regrowth more than 5 years old and ground cover limited. Introduced in 1930s and 1940s in Tasmania, where expanded range by c. 1 km annually and expansion continuing. Has low recruitment rate but high longevity. Main threat probably further habitat loss, as some populations not in protected reserves; in addition, predation on adults and nestlings by introduced mammals can have significant adverse impact on numbers.
Bibliography. Ashton & Bassett (1997), Baptista (1996), Bassett (1987), Baxter (1993), Bell (1976), Beruldsen (1980), Blakers *et al.* (1984), Campbell & Gray (1942), Carmichael (1995, 1998), Diesselhorst (1973), Fleay (1952), Godfrey (1905), Hastwell (1985b), Higgins *et al.* (2001), Hindwood (1960), Holz (1997), Kenyon (1972), Lill (1979a, 1979b, 1980, 1986, 1987, 1996), Lindsey (1992), Loyn (2002), Loyn & Loyn (2002), Macdonald (1988), Mason (1986, 1987, 1999), McAllan & Bruce (1989), McMahon (1997), McNabb (1982), McOrist & Scott (1989), Miller (1991), Morcombe (2000), Morlion (1980, 1985), Moroney (1972), O'Donoghue (1931), Payne (1984), Pizzey & Knight (1997), Powys (1995), Ramesh *et al.* (1988), Reilly (1970, 1988), Roberts, S. (1922), Robin (2001), Robinson (1991), Robinson & Frith (1981), Rose (1973, 1974, 1999, 2001), Schodde & Mason (1999), Schodde & Tidemann (1986), Sharland (1944, 1952), Simpson & Day (1998), Slater (1997), Smith, L.H. (1982, 1988, 1990, 1994, 1995, 1999, 2004), Steinbacher (1998), Tanner (2000), Taylor (1986), Thorburn (1979), Tregallas (1997), Trounson & Trounson (1987), Wall & Wheeler (1966), Watson (1965), Watts (1999), Zusi (1985).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family ALAUDIDAE (LARKS)



- Small to medium-sized terrestrial passerines with drab, mostly brownish or buffish plumage, 10 primaries, outer one often much reduced, long tertials; scutes on posterior surface of tarsus, nail of rear toe usually long and straight, and bill exceedingly variable in size and shape.
- 10-23 cm.



- Africa and Eurasia, with single species in each of Australasia, Madagascar and America.
- Open country, often in arid or semi-arid environments.
- 21 genera, 96 species, 407 taxa.
- 8 species threatened; none extinct since 1600.

Systematics

The honour of heading the sequence of oscine families falls upon the apparently humdrum larks, the Alaudidae, a relatively limited group of small, dun-coloured birds typical of the treeless regions of Africa and Eurasia. This has been the case since the 1930s, when two influential ornithologists, the American A. Wetmore and the German E. Stresemann, independently came to the same taxonomic conclusion. They were united in the conviction that the larks are distinguished by two unique and primitive features which give them a separate identity and point to an evolutionary origin distinct from that of other living oscines.

On the one hand, there is the peculiar morphology of the tarsus, which is latiplantar, having the posterior surface flat and scutellate, covered with prominent scales, instead of being narrow and smooth as in the other families. On the other hand, the syrinx, the organ of voice, is relatively simple in structure, having just five pairs of muscles and with a pessulus, the bony nodule located at the bronchial junction, which is rudimentary. In general, the oscines, or songbirds, have between six and eight pairs of syringeal muscles, as well as a well-developed, ossified pessulus, features which relate to the capacity of such birds to produce complex songs. Nevertheless, the larks, too, are distinguished in the quality of their voices and in their capability as skilled mimics of other birds.

In contrast to these two anatomical peculiarities, which are supposedly primitive and, hence, of particular taxonomic value, other alaudid characters either are too variable within the family as a whole to be diagnostic or are of a comparatively plastic nature, involving, as they do, such features as gait or diet which are all too likely to have produced superficial similarities with other groups as a result of adaptive convergence. For example, the outermost primary, although typically reduced, is very variable in size, perhaps in connection with different migratory habits, and equally variable is the length of the hind claw, which in general is long and straight. The bill is especially variable in shape and thickness, being short and stout in the more granivorous species and long and slender in the more insectivorous ones. Notwithstanding these considerations, earlier taxonomists, such as J. Berlioz, have given weight to the above features and have suggested a placing of the Alaudidae alongside the families of granivorous birds of the nine-primaried group, notably the buntings (Emberizidae), the weavers (Ploceidae) and the finches (Fringillidae), towards the end of the list of oscine families. The contrary ranking, with the Alaudidae at the head of the list, nevertheless prevailed and was adopted in the sequence proposed by E. Mayr and D. Amadon in 1951, and in the "consensus list" which emerged from the XI International Ornithological Congress, which took place in Basel, Switzerland, in 1956.

The "larks-first" tradition has endured to the present day, but there is a growing body of genetic evidence suggesting that the honour belongs instead to several ancient Australasian families. The latiplantar tarsus and the lack of a defined pessulus are probably derived, and not primitive, features. DNA-DNA hybridization studies carried out by C. G. Sibley and J. E. Ahlquist suggest



In larks, as with many passerine families, taxonomic review tends to suggest that the group has been overlumped. One of the most extreme cases involves the Long-billed Lark complex, which has recently been split into five separate species. All these forms, including the ***Benguela Long-billed Lark****, live in southern Africa. The dividing lines between some of these recently split species are still none too clear, notably in the region of Brandberg, where the Benguela meets the Karoo Long-billed Lark* (Certhilauda subcoronata). *Indeed, the latter's local race,* damarensis, *may really belong in the Benguela.*

[*Certhilauda benguelensis kaokoensis*, Brandberg, Namibia. Photo: Andy & Gill Swash]



Described as a species in 1937, ***Barlow's Lark*** *was relegated shortly afterwards to subspecific rank within the* C. albescens-erythrochlamys *complex until analysis of vocal, morphological and genetic differences across the range of this complex led to three species being identified in 1998. The southern coastal race of Barlow's Lark is pale and the southern interior race reddish, corresponding to variations in geology. These plumages look very different, but the populations are identical genetically and vocally.*

[*Calendulauda barlowi patae*, Porth Nolloth, Western Cape, South Africa. Photo: Andy & Gill Swash]

that the closest groups to the larks are, as Berlioz suggested, the Old World sparrows (Passeridae), finches and buntings, and that these form a natural grouping, the superfamily Passeroidea, together with the weavers, the waxbills (Estrildidae), the pipits and wagtails (Motacillidae), the accentors (Prunellidae), the sunbirds (Nectariniidae), the tanagers (Thraupidae) and the New World blackbirds (Icteridae), among others. DNA-DNA hybridization, however, has limited discriminatory capabilities. Other and newer techniques of genetic investigation, such as the sequencing and analysis of conserved genes within nuclear DNA, have now suggested that the affinities of the larks are not with the Passeroidea but rather with another superfamily, the Sylvioidea, a diverse assemblage of passerine families including the long-tailed tits (Aegithalidae), the Old World warblers (Sylviidae), the babblers (Timaliidae), the bulbuls (Pycnonotidae), the white-eyes (Zosteropidae) and the swallows (Hirundinidae). Other families formerly placed in the Sylvioidea by Sibley and Ahlquist now appear rather more distantly related, including the nuthatches (Sittidae), the treecreepers (Certhiidae), the waxwings (Bombycillidae) and the tits (Paridae). Additional support for a link to the warblers was reported in the 1950s by W. J. Beecher, who found a similarity in mandibular musculature between the larks and the *Cisticola* warblers. Be that as it may, the larks provide an excellent example of the caution which is necessary before more or less revolutionary taxonomic changes are adopted.

If the taxonomic affinities of the family remain unclear, still less is known about its internal groupings, despite the fact that much has been written on the subject. The fundamentally cryptic, dun-coloured plumages, lacking striking distinctive features, together with the variability of such characters as bill structure, have frustrated all attempts to identify subgroups on the basis of external morphology. Certainly, some groups are better defined than others. The sparrow-larks (*Eremopterix*), for instance, form a natural group, with marked sexual dimorphism and rather conservative plumage and morphology. Similarly, the crested larks (*Galerida*) are a well-defined group, the six members being characterized by similar displays and some morphological attributes. Relationships among the majority of larks, however, are poorly understood. The large genus *Mirafra*, in which up to one-third of all species were included in the past, is widely accepted as a "dumping ground" for a wide assortment of species, while some monotypic genera may not be sufficiently distinct to be justified; the single-species *Lullula*, for example, could be merged with *Alauda*.

Evidence from ongoing genetic-based studies of lark phylogeny allows the family to be restructured taxonomically. Data derived from mitochondrial-DNA sequencing provide a compelling argument for splitting certain elements from *Mirafra* and *Certhilauda* and resurrecting a separate genus, *Calendulauda*, for them. Unfortunately, not all species have been subjected to genetic sequencing, and in some cases, therefore, there is little alternative but to follow traditional practice. For example, species such as Gillett's Lark (*Mirafra gilletti*) and the Degodi Lark (*Mirafra degodiensis*) may well belong in *Calendulauda*, but for the present they are left in *Mirafra*. The genetic data strongly indicate that convergence has confounded previous phylogenies. For example, Gray's Lark (*Ammomanopsis grayi*), the small, plain-backed lark of gravel plains in the Namib Desert of south-west Africa, has traditionally been placed in the genus *Ammomanes*, along with the desert larks of north Africa and Asia, but genetic evidence clearly suggests that it is much closer to the morphologically quite distinct long-billed larks in the genera *Chersomanes* and *Certhilauda*. Accordingly, it is placed in its own genus, *Ammomanopsis*. The link to *Chersomanes* is intuitively appealing, because both occur in family parties throughout the year, and at least occasionally breed co-operatively, an unusual mating strategy among larks. The genetic data suggest that certain arrangements are not well supported. One example concerns Stark's Lark (*Spizocorys starki*), which many recent authors have placed with Dunn's Lark (*Eremalauda dunni*) in the genus *Eremalauda*, although the genetic evidence indicates clearly that it belongs within the broader group of *Spizocorys*. Unfortunately, no material from Dunn's Lark has been sequenced, and it remains uncertain, therefore, whether *Eremalauda* is a valid genus.

The mitochondrial DNA genes sequenced to date lack the power to resolve deeper relationships among lark genera. For example, the basal genus within the family varies according to the choice of outgroups and the analysis technique used. Intriguingly, in several analyses, *Heteromirafra*, the genus of peculiar short-tailed, big-headed larks with three highly localized species in south and north-east Africa, emerges as basal. Their very restricted and widely scattered ranges are suggestive of an old genus. Another contender that frequently emerges as basal is the Greater Hoopoe-lark (*Alaemon alaudipes*). A study aimed at resolving the deeper relationships within the Alaudidae, and employing more conserved nuclear genes, is currently being undertaken.

Mitochondrial genes have been useful in resolving species-level questions within the lark family. Although there has been considerable debate about the relationships among larks at both the species level and the genus level, even more has been written about the biological significance of geographical variation within



Traditionally placed in the genus Ammomanes, ***Gray's Lark*** *of the Namib Desert now finds itself the sole occupant of the genus* Ammomanopsis, *relocated far from* Ammomanes *in the taxonomic sequence. This shift in fortunes rests on the fact that, according to recent genetic analysis, the apparent similarity between Gray's Lark and the "desert larks" of North Africa and Asia is the result of convergence rather than common ancestry. Short bills and uniform pale upperparts are simply adaptations to life on level sandy or stony plains. Gray's Lark now appears to be more closely related to the longer-billed* Chersomanes *and* Certhilauda *larks, which seem very different morphologically.*

[*Ammomanopsis grayi grayi*, Swakopmund, Namibia. Photo: Andy & Gill Swash]

species. Cryptic species, or sibling species, appear to be widespread within the Alaudidae, and are very difficult to discern within the extensive geographical variation in plumage colour and pattern, linked to adaptation to local soil colour and vegetation density, that is shown by many lark species (see Morphological Aspects). A well-known case is that of the Thekla Lark (*Galerida theklae*) and the Crested Lark (*Galerida cristata*), which for long were confused with each other until C. L. Brehm separated them, in 1858. The vexing question has been that of how to differentiate intraspecific adaptation to local conditions from actual differences at the species level.

Lark taxonomy has followed the classic pattern of oversplitting, lumping, and resplitting of several species. The primary descriptive phase took place mostly during the nineteenth and early twentieth centuries, when many taxa were described as distinct species in accordance with a largely typological species concept. There was then a period of consolidation during the mid-twentieth century, when many taxa were lumped, following the biological species concept; at that time, the number of alaudid species generally recognized fell to about 75. Recent studies have tested the validity of some of these polytypic species by using a diversity of evidence, including vocalizations and reanalysis of morphology, as well as genetic-sequence data. The results have been varied, but, in general, the genetic data have often revealed significant variation among "subspecies", indicating that such taxa have had separate evolutionary histories for perhaps between one million and five million years, as estimated from cytochrome *b* gene divergences of 2-10%. The number of lark species currently recognized has already risen to nearly one hundred.

In some instances, these latest genetic studies have resulted in the original, morphologically based species being upheld and new taxa being "discovered". In the "long-billed lark complex" of southern Africa, for example, genetic evidence led P. G. Ryan and P. Bloomer to support the recognition of three of the four morphologically defined species originally proposed by A. Roberts in the 1930s: the Cape Long-billed Lark (*Certhilauda curvirostris*), the Karoo Long-billed Lark (*Certhilauda subcoronata*) and the Eastern Long-billed Lark (*Certhilauda semitorquata*). It also suggested, however, that two additional species should be recognized. One of these, the Agulhas Long-billed Lark (*Certhilauda brevirostris*), is quite distinct both morphologically and vocally, but the other, the Benguela Long-billed Lark (*Certhilauda benguelensis*), is rather poorly defined in terms of morphology, although, admittedly, it has not been well studied. In a similar investigation, P. Alström found that the "*Mirafra assamica* complex" contained four cryptic species that had hitherto been treated as conspecific; these are the Bengal Bushlark (*Mirafra assamica*), Jerdon's Bushlark (*Mirafra affinis*), the Indochinese Bushlark (*Mirafra erythrocephala*) and the Burmese Bushlark (*Mirafra microptera*).

Nevertheless, not all forms originally described as full species can be maintained as such. In the Karoo Lark (*Calendulauda albescens*) complex of forms living in western South Africa, Roberts considered that the marked change in plumage colour, from pale grey-brown on the whitish coastal sands to rich rufous on the reddish interior sands, warranted the separation of the two populations at the species level; he referred to the pale coastal form as "*C. albescens*" and the rufous interior form as "*C. guttata*". Indeed, the borderline between these two colour morphs is extremely marked, the plumage colour often changing completely within a distance of a few kilometres, and with very few intermediate individuals entirely confined to the transitional zone. In the terms of the phylogenetic species concept, it could be argued that this is a character separating two "species", but, conversely, there is no genetic difference between the two populations, and they share the same morphology and songs. Clearly, in this case, the two are best treated as conspecific, with different subspecies names as convenient labels to describe the observed variation. Interestingly, the same colour switch, from pale to rufous, occurs also in Barlow's Lark (*Calendulauda barlowi*), recently split from the Karoo Lark, which it replaces geographically in the north.

To date, only a few species complexes have been studied by adopting an integrated approach incorporating vocal, morphological and genetic evidence. What can be learnt from these studies? Probably, there are not any general rules, other than that further investigation is likely to result in the recognition of many more lark species, in the sense of evolutionary entities. These "new" species are most likely to be identified among resident species that exhibit high levels of regional variation. Probable candidates in this category include the Crested and Thekla Larks, several of the isolated African populations of which are quite distinctive, as well as the Rufous-naped Lark (*Mirafra africana*).





Most members of the family are dull, dun-coloured birds, predominantly brown or fawn in tone, always paler or even white below. Their earthy tones and counter-coloration provides camouflage in open terrain, where they tend to be well lit from above. In general, the colour of lark upperparts matches the colour of the substrate where they live. Thus, the pallid ***Dunn's Lark*** *lives in pale sandy deserts, whereas the* ***Rufous-tailed Lark*** *lives against a darker background. Even within a given species, mantle colour varies in different parts of the range according to the colour of soils and sands. In general, lark plumage comes in two types. One is variegated and thus camouflaged on broken terrain. Another is uniform and thus camouflaged only where the background is relatively smooth. These two species are of the latter variety. They have the stubby, conical bills typical of granivorous species, with that of the monotypic genus* Eremalauda *being especially blunt-tipped. The more insectivorous larks tend to have relatively slender, sharp or decurved bills. There is also a relationship between bill shape and substrate, with stubbier-billed species usually being birds of harder or rockier ground, and longer-billed species usually living in sandy environments.*

[Above: *Eremalauda dunni eremodites*, Israel. Photo: Göran Ekström.

Below: *Ammomanes phoenicura*, Kachchh, Gujarat, India. Photo: Otto Pfister]





Although larks in general are cryptic, some species are much more boldly marked than others. The most piebald patterning is found in members of the genus Eremopterix, *such as the* ***Black-crowned Sparrow-lark****. The sparrow-larks are the only members of the family to exhibit notable sexual dimorphism, males being much more ornate than their dowdy partners. Another genus of boldly patterned larks is* Eremophila, *both members of which have black elongated feathers on either side of the hind crown. These "horns" are much less prominent in females, allowing us to identify this* ***Temminck's Lark*** *as a male. Despite the striking plumage of* Eremopterix *and* Eremophila, *they are often surprisingly well camouflaged, especially as they crouch whenever there is cause for alarm.*

[Above:
Eremopterix nigriceps melanauchen,
Sohar, Oman.
Photo: Hanne & Jens Eriksen.

Below:
Eremophila bilopha,
Arava Valley, Israel.
Photo: Dick Forsman]



The genus Pinarocorys *contains two species which, were it not for their odd structure, sexual dimorphism and migratory habits, might otherwise be placed in* Mirafra. *Both have striking facial patterns and boldly marked breasts. One of them, the* ***Dusky Lark****, is pictured here in the open country of its wintering range; it breeds in burnt areas in miombo woodland. Due to its bulk and its habit of perching in trees, this species is perhaps more often mistaken for a Groundscraper Thrush* (Psopocichla litsipsirupa) *than any other species of lark. It even looks rather thrush-like in flight.*

[*Pinarocorys nigricans*, South Africa. Photo: Roland Seitre]

Judging from the distribution of the living species, it seems clear that the evolutionary origins of the Alaudidae were in Africa. Not only do 78, over 80%, of the 96 currently recognized species occur in Africa, but 60 of those are found nowhere else. Eurasia has 36 species, 17 of them endemic. The proportion of species that are endemic to each continent therefore reaches 77% in Africa and 47% in Eurasia. In addition, those species which are not exclusive to one of these two landmasses tend to be shared by both of them. The sole species to have reached the New World, the Horned Lark (*Eremophila alpestris*), extends widely throughout North America south to southern Mexico, and has a very interesting disjunct presence in South America, in the Andean Altiplano near Bogotá, in Colombia. This species, however, is very far from being exclusively American. On the contrary, it has the widest global distribution of any alaudid, being the only one to occupy boreal latitudes and, moreover, extending south in Eurasia through mountain chains from the Moroccan High Atlas to the Himalayas. The only other species occurring outside the strictly African-Eurasian distribution are the Madagascar Lark (*Mirafra hova*), restricted to Madagascar, and the Australasian Bushlark (*Mirafra javanica*), which extends from South-east Asia and the Philippines through Indonesia and New Guinea to Australia. It is clear, therefore, that the larks are principally an African and secondarily a Eurasian family. Their presence in the Americas and Australia is exceptional, and perhaps of relatively recent origin: given the extent and diversity of arid ecosystems there, one might have anticipated a much stronger representation of alaudids.

Larks are resident on numerous islands which either lie near continents, as in the case of Madagascar, or have been joined to the mainland in past epochs when sea-levels were lower, as applies to many of the islands occupied by the Australasian Bushlark. Japan is home to the endemic subspecies *japonica* of the Eurasian Skylark (*Alauda arvensis*), and the family is represented in Taiwan, on Hainan, in Sri Lanka, in the British Isles and on many other islands. All of the major Mediterranean islands hold larks, and several species are present on some of them, there being five breeding alaudids in Crete and Sicily, for instance. As is often the case with island avifaunas, however, there are conspicuous absences of certain species which are common on the nearby continental mainland; for example, on the Balearic Islands, adjacent to the Iberian Peninsula, only the Thekla Lark and the Greater Short-toed Lark (*Calandrella brachydactyla*) breed. The latter species, certainly, is the most widely distributed among the Mediterranean islands, whereas the Lesser Short-toed Lark (*Calandrella rufescens*) is absent from all of them, although the geographical ranges of the two species are otherwise similar. No doubt, the Greater Short-toed Lark, a more migratory species, is better able to colonize islands than is the Lesser Short-toed Lark, which is sedentary. Even so, it is curious that in the Canary Islands, where the former appears frequently on passage, the sole breeding lark species is the Lesser Short-toed Lark. Other noteworthy cases of insular occupation by larks include the island of Socotra, some 250 km from the coast of Somalia, which is inhabited by the Black-crowned Sparrow-lark (*Eremopterix nigriceps*), and the Faeroes, 350 km north of Scotland, which have the Eurasian Skylark. Particularly remarkable is the Cape Verde Archipelago, which lies some 500 km off the African Atlantic coast, and where up to four lark species breed; these are the Greater Hoopoe-lark, the Bar-tailed Lark (*Ammomanes cinctura*), the Black-crowned Sparrow-lark and the Raso Lark (*Alauda razae*), this last having a global range that is confined to just one tiny island of the archipelago.

The distribution of lark species within Africa is far from uniform. There are two "hot spots" of diversity, corresponding to the arid zones of the north-east and of the south-west. The former, which is centred on Ethiopia and Somalia, holds no fewer than 37 species, of which 62% are endemic. The south-western centre corresponds with the deserts and semi-deserts of Namibia, Botswana and South Africa and has 33 species, 85% of which are endemic or near-endemic. Many of the endemics of both these zones are extremely limited in geographical distribution and, for that reason, some of them are among the most vulnerable of all alaudids, although their arid habitats tend to place them under less pressure than is faced by species occupying habitats with greater agricultural potential (see Status and Conservation). These two arid regions are home to a combined total of 65 species, approximately 83% of the African total and 68% of the world's lark species. Bearing in mind that the lark family is essentially adapted to open, arid regions (see Morphological Aspects, Habitat), there would seem to be merit in the hypothesis, perhaps first formulated by R. E. Moreau, that links the high levels of species diversity and endemism to the finding that the aridity of these



*The steppes of Central Asia are home to one of the most distinctive members of the family: the **Black Lark**. Other* Melanocorypha *larks have small patches of black on the plumage, but this one takes melanism to the extreme. The male moults into fresh brown plumage in autumn, but in spring the tips of these feathers abrade, revealing his black breeding dress. This plumage signal must at times be costly, as it renders the male very poorly camouflaged in comparison with the drab female. In flight, he looks long-winged and almost starling-like.*

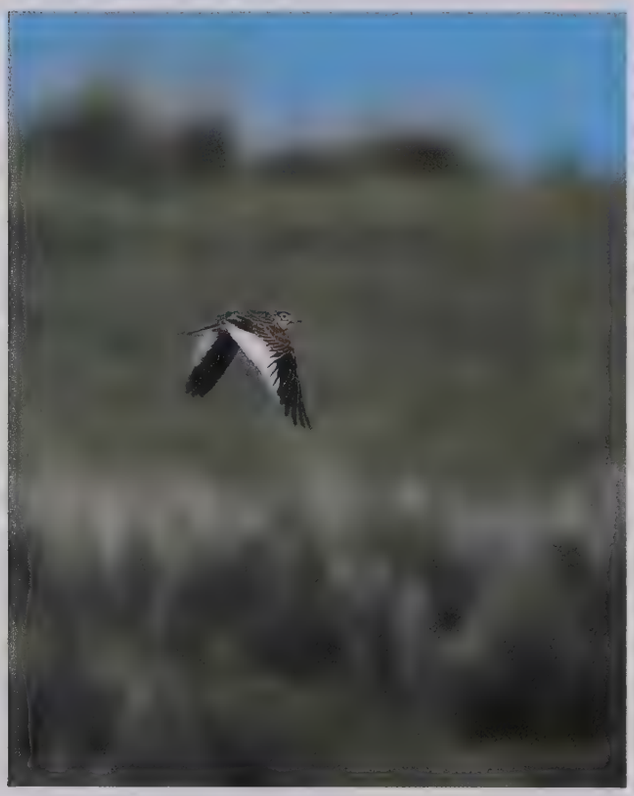
[*Melanocorypha yeltoniensis*, Kazakhstan. Photo: Tim Loseby]

two corners of Africa is of long standing. As may be supposed, both zones also hold numerous other endemic open-country avian species of believed Afrotropical origin, such as bustards (Otididae), sandgrouse (Pteroclidae), coursers (*Cursorius*), wheatears (*Oenanthe*) and cisticolas. It is, however, in the Alaudidae that both the highest number and the largest proportion of endemic species are found.

These two African zones of maximum lark diversity are currently completely isolated from each other, but they may well have been linked during interpluvial periods of the Pleistocene by a corridor of arid territory through the east of the continent, passing through present-day Kenya, Tanzania, Zambia and Zimbabwe. This would perhaps explain the current existence of species pairs in which the partners are of very closely related ancestry but are now separated geographically by thousands of kilometres, comprising what are termed vicariant species in biogeography. Such cases exist in various bird groups, but the Alaudidae provide excellent examples in the species pairs formed by the Chestnut-headed Sparrow-lark (*Eremopterix signatus*) of the north-east zone and the Grey-backed Sparrow-lark (*Eremopterix verticalis*) of the south-west zone and, equally, by the north-eastern Archer's Lark (*Heteromirafra archeri*) or Sidamo Lark (*Heteromirafra sidamoensis*) and the south-western Rudd's Lark (*Heteromirafra ruddi*). The existence of an arid corridor of this kind could likewise explain the various other instances of vicariance between larks of northern and southern Africa, such as that seen in the two species of *Pinarocorys*, the northern Rufous-rumped Lark (*Pinarocorys erythropygia*) and the southern Dusky Lark (*Pinarocorys nigricans*). For most species pairs for which data are available, however, the magnitude of genetic differences are substantial, suggesting that the taxa in question became isolated from each other during the Pliocene, rather than during the more recent Pleistocene.

Larks are typical inhabitants of the north African deserts. None of the species, however, is exclusive to this region, and the lark community does not have the level of species diversity of the aforementioned zones. Thus, the distributions of the most typically Saharan alaudids, including the well-known Desert Lark (*Ammomanes deserti*), Thick-billed Lark (*Ramphocoris clotbey*) and Greater Hoopoe-lark, extend across the adjacent deserts of south-west Asia, helping to define the boundaries of the Saharo-Sindian region, the belt of arid lands which extends from the Maghreb, in north-west Africa, eastwards to the Sind and other deserts of Pakistan and north-west India. Larks comprise roughly one-fifth of all the bird species of this region.

In Eurasia proper, two zones stand out for the diversity and levels of endemism of their lark communities. The cold deserts of the Caspian-Mongolian region, in the centre of the continental landmass, hold at least 15 species, nearly half of which, comprising five *Melanocorypha* and two *Calandrella* species, are found nowhere else. The Oriental Region, in the south, contains 23 species of alaudid; ten of these, including five *Mirafra* bush-larks, two *Galerida* species, and one representative of each of





*Although most larks are cryptic when perched, many species have bolder patterns on the wings or tail which become visible in flight. Pale outer tail feathers, or pale trailing edges to the wings, are common features, though few bear these badges as strikingly as the **Mongolian Lark**. The prize for the most dramatic wing pattern in the family, however, must go to the **Greater Hoopoe-lark**. These patterns possibly distract predators, and certainly function as signals of identity or individual quality.*

[Left: *Melanocorypha mongolica*, China. Photo: Göran Ekström.

Right: *Alaemon alaudipes alaudipes*, Egypt. Photo: Oriol Alamany]



The ability to hover for prolonged periods during song flights is an important sexually selected trait in male larks. Some species are relatively immobile during these hovering displays, but others, such as the ***Greater Short-toed Lark****, slowly circle, meander or undulate. Although males of this species usually hover 30-50 m up, some species display so high above the ground that they are very difficult to see with the naked eye. Male larks of several species regularly spend up to ten minutes hovering in this way, which must represent a major energetic outlay, before plummeting steeply back to earth.*

[*Calandrella brachydactyla brachydactyla*, Greece. Photo: Tomi Muukkonen]

the genera *Ammomanes*, *Eremopterix* and *Calandrella*, are restricted to this region. By comparison, Europe has very little to offer in terms of lark diversity, which is hardly surprising when one considers its marginal position on the Eurasian landmass, its relatively limited extent and, above all, its generally temperate and wet climate, which is unsuited to such birds. Only three members of the family are widely distributed in Europe, these being the Eurasian Skylark, the Woodlark (*Lullula arborea*) and the Crested Lark. More occur around the Mediterranean Basin, with five species on the Italian peninsula, six in the Balkans and eight in Iberia, all of them shared with northernmost Africa. The south-eastern part of European Russia, adjacent to Kazakhstan, has ten species. Both here and in Iberia, the diversity of larks and their prominence within the passerine community increase gradually in a south-easterly direction, in tandem with the increasing aridity of the terrain.

Morphological Aspects

As passerines go, the larks are neither particularly large nor especially small, ranging in size from that of a finch to that of a Common Starling (*Sturnus vulgaris*). Body length ranges from approximately 10 cm, as with some female sparrow-larks in the genus *Eremopterix*, to 23 cm in the case of the largest males of the relatively elongated Greater Hoopoe-lark. The sparrow-larks may weigh as little as 12 g, whereas the Tibetan Lark (*Melanocorypha maxima*) can reach at least 75 g. Within any species or subspecies, weight is, of course, highly variable, being dependent at least in part on food resources and the time of the year. In some species, such as the Woodlark and the Crested Lark, the sexes do not differ appreciably in dimensions. For the majority of the alaudids, however, the males are significantly the larger sex, with mean weights up to 20-25% greater than those of the females. Because of this, it is sometimes possible, with practice, to distinguish in the field between the males and females of lark species that are not sexually dimorphic in plumage. In the southern African alaudids, at least, this sexual size dimorphism may be related to feeding habits, as it is more evident in the most insectivorous species, such as the Spike-heeled Lark (*Chersomanes albofasciata*), than in the more granivorous ones.

Among the passerines, the larks do not stand out as having any striking body proportions. In general, they are relatively robust, large-winged and moderately long-legged. The toes and front claws are relatively short. The hind claw, however, is variably long, straight and narrow, sometimes markedly so, recalling that of other terrestrial passerines such as the pipits (*Anthus*) and longclaws (*Macronyx*) of the family Motacillidae, or the longspurs (*Calcarius*) of the family Emberizidae. Attempts have been made to relate the variation in hind-claw size to the substrate used by each species, but it is odd that short-curved hind claws are found in species such as the Desert Lark and the Greater Hoopoe-lark, which inhabit sandy deserts, and long straight ones in larks of other habitats, for example in the Eurasian Skylark and the Woodlark, the latter being typical, as its name suggests, of fairly wooded terrain. It is possible, although the available information is insufficient to demonstrate it, that there may be a relationship between hind-claw size and the extent to which a species runs, for it could be expected that all claws, including the hind claw, would be shorter and stronger in those species which are capable of fast running, among which the very long-legged Greater Hoopoe-lark is pre-eminent. This species is said to be able to run for extended periods at a speed of 8 km/h.

All larks move with agility on the ground, whether walking or running, and some, such as Dupont's Lark (*Chersophilus duponti*), prefer to run rather than to fly when avoiding terrestrial predators or human observers. Moreover, there seems to be a correlation between leg length and diet: the more insectivorous species have longer legs and are better runners than the specialist seed-eaters, which have relatively short tarsi. This difference would seem to be adaptive, longer legs enabling better running ability when chasing insects and short legs being more suited for the behaviour of searching for small seeds on the ground.

Larks are sometimes seen to hop, especially as juveniles during their first days after leaving the nest; indeed, young Horned Larks hop during nearly the whole of their first month out of the nest. This may indicate that this style of locomotion is more ancient phylogenetically than is walking. In addition, Thick-billed Larks frequently hop, and hopping features in the courtship displays of several species.

The Alaudidae have ten primaries, but the outermost, the tenth when the feathers are numbered descendantly, is very vari-



*This **Greater Short-toed Lark** is immediately identifiable as a juvenile because it is distinctly mottled. In comparison with adult larks, juveniles tend to have paler fringing or tipping to the feathers of the upperparts and crown, and any striking features are usually dull or absent. This all helps to ensure that, for the first 4-6 weeks at least, young birds are well camouflaged. During these early days juveniles usually hop, before they learn to run like adults. Seed-eating larks, such as those in the genus* Calandrella, *tend to have relatively short legs, while insectivorous larks are longer-legged, and thus better adapted for running at high speed.*

[*Calandrella brachydactyla brachydactyla*, Corella, Navarre, Spain. Photo: José Antonio Martínez]

able in development. It is practically vestigial in some genera, as in *Melanocorypha* or *Calandrella*, yet in others it extends well beyond the tip of the longest primary covert, as occurs in *Ammomanes* and *Alaemon*. It seems that, in general, a long tenth primary is associated with short, rounded wings, such as those possessed by the more sedentary species. Hence, it has been hypothesized that the longer, narrower wings of long-distance migrants have evolved from the earlier arrangement, the reduction of the tenth primary being a part of this process. The idea that the short tenth primary may be derived from a longer antecedent may also be supported by the fact that these small feathers are longer and wider in juveniles than in adults. As an example, the tenth primary of the adult Eurasian Skylark falls 10-17 mm short of the tips of the primary coverts, whereas that of the juvenile is between 6 mm shorter and 1 mm longer in relation to the covert tips. Similarly, the narrow and pointed outer primary of the adult Thick-billed Lark falls 4-12 mm short of the primary-covert tips, but the round-tipped outer primary of the juvenile varies in length from almost reaching the tips of the primary coverts to extending 2 mm beyond them. There are many comparable examples within the family.

Differences in wing formula are often very useful in distinguishing between species which are otherwise very similar in appearance. The Oriental Skylark (*Alauda gulgula*), for instance, has the sixth primary 0-6·5 mm shorter than the longest primary, whereas the corresponding figure for the more migratory races of the Eurasian Skylark is 4-13 mm. It is, however, interesting to note that, in the more or less sedentary race *japonica* of the latter, the sixth primary is only 2-8·5 mm shorter than the longest one.

Overall, and taking weights into account, male larks have larger wings than females. This may be adaptive in respect of the male's extended song flights, the high energy costs of which may be mitigated by its having a reduction in wing-loading, that is, in mass supported per unit wing area (see Voice). When migratory and sedentary species are compared, the former are seen to have narrower wings, and hence higher wing-loadings, than the residents, a fact which was noted with surprise by R. Meinertzhagen. In pairwise comparisons of lark species of similar sizes, the migratory Greater Short-toed Lark has a wing-loading of approximately 0·34 g/cm², as opposed to the 0·26 g/cm² of the sedentary Desert Lark; similarly, the Calandra Lark (*Melanocorypha calandra*), a partial migrant, carries 0·32 g/cm², compared with the 0·15 g/cm² of the Greater Hoopoe-lark, a sedentary or, at best, dispersive species. In fact, among birds in general, narrow wings and high wing-loading are associated with fast flight, which is probably of particular value to long-distance migrants.

Strikingly long tertials are a feature of alaudid wings. On larks, as on pipits and wagtails, the tertials cover all of the primaries when the wings are closed, or they allow at most only the tips of a few to be exposed. This cloaking may protect the primaries from abrasion, something which is likely to be especially useful to such terrestrial birds, a consideration which applies to the Motacillidae as well as to the Alaudidae. Lark tertials do, indeed, habitually exhibit a high degree of wear.

Diverse species, among them the Eurasian Skylark, the Greater Short-toed Lark and the Rufous-naped Lark, have a crest composed of a group of longer, erectile head plumes, which the birds raise when excited. In the crested larks in the genus *Galerida*, these crests are long, pointed and permanently raised. The two species of *Eremophila*, the Horned Lark and Temminck's Lark (*Eremophila bilopha*), sport a different type of head adornment in the shape of two little "horns", comprised of long, black, pointed feathers forming upright tufts on each side of the hindcrown, which are particularly prominent on males.

As part of this family's general adaptation to open terrain, lark plumages are always cryptic, predominantly brown or fawn in tone, darker above and paler, sometimes almost white, below. Two types of plumage pattern have been identified, and G. L. Maclean has termed these, respectively, "generalized" and "specialized". The first type, which is exhibited by most species, is distinguished by having a mixture of colours, often with dark streak-shaped or spot-shaped feather centres set against a more or less buff background. The specialized type is more uniform, and involves a close colour match with the background tones of the birds' habitual terrain. Very pale, sandy-desert tones are frequently found in this second type, but rufous, greyish or blackish tones often occur also. The generalized type provides camouflage which is effective in nearly any type of terrain, but the specialized type is effective only where there is a perfect colour match between ground and plumage. It is not surprising, therefore, that, as has been noted in southern Africa, migratory or nomadic larks have generalized cryptic plumages and sedentary species display



Like other passerines, larks are equipped with strong feet, and they perch on twigs with ease. Nonetheless, many species spend most of their life on the ground. When disturbed, the ***Crested Lark****, like other members of the genus* Galerida*, usually flaps away, with its distinctly rounded wings giving it a very characteristic look. Nine times out of ten it will drop back down to the ground, but in this case it has chosen an elevated perch. The hind claw in larks can be very long, as it is in other terrestrial passerines, such as the pipits and wagtails (Motacillidae), and its precise form is probably connected with the normal mode of movement of each species, although to date this remains largely a matter for speculation. Much more conspicuous in this photo is the crest which gives this particular species its name. Many larks, especially those in the genera* Alauda *and* Galerida*, possess erectile crests which they raise when excited or alarmed. None is longer, or used more frequently, than that of the Crested Lark. Across its extensive range this species occurs in a variety of habitats, but typically in dry, dusty or grassy plains, generally with fairly sparse vegetation. It also occurs in semi-desert, but in other areas frequents biotopes heavily modified by the activities of man, especially farmland.*

[*Galerida cristata iwanowi*, Badkhyz Nature Reserve, Turkmenistan. Photo: Gertrud & Helmut Denzau]



All larks are associated with more or less open habitats. Of these, natural grasslands are important, whereas other types of grassland, such as lawns, pastures and cultivation, are less popular. These man-modified habitats have found most favour with members of the genus Alauda, *including the* ***Oriental Skylark****. This species can breed and winter in cultivated fields or grazing lands, but it also favours the margins of wetlands. One of its diagnostic features is shown very clearly in this photograph: the largest tertial almost entirely cloaks the primaries, whereas the primaries project much further beyond the tertials in the Eurasian Skylark* (Alauda arvensis).

[*Alauda gulgula*, Oman. Photo: Markus Varesvuo]

the specialized type. In the Kalahari sandveld, for example, the sedentary larks of the reddish sand dunes, such as the Eastern Clapper Lark (*Mirafra fasciolata*), have rufous plumage tones and those inhabiting areas of grey calcrete soils are themselves greyish, as is demonstrated by the Grey-backed Sparrow-lark. Further, the intensity of dark streaking of the dorsal plumage has a clear correlation with the extent of plant cover, at least in Africa, where the darkest and most densely streaked species are those living in the most vegetated habitats.

Much discussion has centred on the function, or functions, of "desert coloration" among the Alaudidae. That it has the role of an anti-predator device is well supported, and the birds' own behaviour provides some of the best evidence to confirm this. It has long been known that individuals of a given colour endeavour to avoid switching to sites where they would be more conspicuous. In Jordan, for example, two races of the Desert Lark live side by side. One of them, *coxi*, is pale and the other, *annae*, which inhabits lava desert, is very dark. It has been reported that it is impossible to displace the dark larks on to pale terrain or to drive the sandy larks on to the dark lava. This specialization in coloration, which is linked to a sedentary existence and is perhaps reinforced by strong philopatric tendencies, favours reproductive isolation and the resultant emergence of subspecies, which would explain in large measure the considerable interspecific differences in the extent of subspeciation in the Alaudidae (see also Systematics). It is interesting to compare, for example, the congeneric Desert Lark and Bar-tailed Lark, species of similar sizes and distributions, the former having 24 subspecies but the latter only three. This difference may be related to their habitat preferences: the Desert Lark inhabits stony and rocky areas, where the ground colour varies greatly with rock type, whereas the Bar-tailed Lark lives in sandy desert, where the ground colour is far less varied.

It should be noted, nonetheless, that some alaudids have a plumage basically of the generalized, cryptic type, but also occur as numerous subspecies. The Crested and Horned Larks are two such examples. These are species with very wide geographical distributions, and which are migratory in the most northerly parts of their ranges but sedentary elsewhere. Their different races exhibit highly variable amounts of streaking. Thus, in the north there are few subspecies, heavily streaked but similar in plumage over extensive areas, while in the south there are many subspecies, all of which show little streaking, or almost none at all, and have a ground colour which closely matches that of the terrain. This near-absence of streaking in southern subspecies is well demonstrated by the Saharan race *arenicola* of the Crested Lark and the Californian desert race *ammophila* of the Horned Lark.

The plumage of larks often includes areas of contrasting coloration. These parts are typically black and white, but are sometimes rufous, as in the wings of the Red-winged Lark (*Mirafra hypermetra*), or yellow, as on the head of the Horned Lark. Such areas are generally of limited extent, however, and very often they are hidden in the wings and tail and are visible only when the bird takes flight, and so they do not otherwise disrupt the species' normal camouflage. Markings of this sort tend to be used for communication; they function as alarm signals, in species recognition and probably also as indicators of individual fitness, this last involving the degree to which they are well defined and symmetrical. Notable display markings include wing patterns, which are especially striking in the Greater Hoopoe-lark and the White-winged Lark (*Melanocorypha leucoptera*), and frequently tail patterns, as seen on, for example, the Bar-tailed Lark and Gray's Lark. Many members of the family have blackish or black wings and tail, which emphasize the white tail borders or outer rectrices. Such patterns tend to be more noticeable when seen from below, a phenomenon which may be connected with the high-level song flights characteristic of larks. In some cases, black and white marks occur on the head, as with the Thick-billed Lark and the Masked Lark (*Spizocorys personata*), and in others they are present between the neck and the breast, as with the Calandra Lark and the Collared Lark (*Mirafra collaris*). Exceptionally, and in the few species which are sexually dimorphic in coloration, such markings cover more extensive areas. This is the case with the Thick-billed Lark, with the seven species of sparrow-lark, the males of which are black on much of the head and ventral areas, and with the Black Lark (*Melanocorypha yeltonensis*), in which the male is basically black and the female dark brown. It is worth pointing out here that, while the markings of male sparrow-larks may seem conspicuous in illustrations, they are certainly not so in the field; this is partly because the head markings provide disruptive camouflage by breaking up the bird's silhouette, and





Certain species in the genera Galerida *and* Melanocorypha *are very partial to grasslands, usually preferring relatively close-cropped vegetation. In Africa, the* ***Large-billed Lark*** *occurs in a wide variety of grasslands, including rocky uplands with a short sward, as here, and longer-sward pastures in the lower foothills. It also occurs in the South African wheat-belt, where it is especially fond of ploughed fields. In all these habitats it forages for grain and seeds, and uses its robust beak to dig in the ground for small bulbs. In Asia, the* ***Tibetan Lark*** *inhabits high-altitude grasslands in the western Himalaya, where it is found around marshes and bogs on the Tibetan Plateau. Not only is this species one of the largest of all larks, weighing up to 75 g, but it lives at higher altitudes than almost all its relatives, having been recorded 4600 m above sea-level.*

[Above: *Galerida magnirostris harei*, Sani Pass, Lesotho. Photo: Joe Tobias.

Below: *Melanocorypha maxima*, Qinghai Hu, China. Photo: Göran Ekström]

partly because the ventral black areas correspond to parts of the bird's body which are normally in shadow.

Juvenile larks tend to differ in plumage from adults. Typically, they have a mottled appearance resulting from pale feather edging on the crown and back, and any contrasting marks either absent or poorly defined. This first plumage is short-lived, lasting for only a month to six weeks. It is followed by a complete post-juvenile moult that includes even the flight-feathers, something which is relatively infrequent among passerine birds. Adults have a single complete moult which takes place after breeding, in early summer in the Northern Hemisphere, and lasts for a couple of months. The primaries are shed descendantly, commencing with the innermost. In general, this is the sole annual occasion of plumage renewal. Changes in appearance in spring, which are often rather marked, result from wear of the contour plumage, the Black Lark providing a striking example. There is, however, one subspecies of the Greater Short-toed Lark, *dukhunensis*, a native of Tibet and central China, for which a partial moult affecting the body and upperwing-coverts has been described. It is certainly surprising that, within a species, albeit one with many races, there should be just one subspecies which departs from the general moult pattern. An explanation may be found in the particularly windy and abrasive conditions of the desert areas which it inhabits. Two annual moults have also been described for three larks of the Namib Desert of south-west Africa, namely Gray's Lark, Stark's Lark and the Grey-backed Sparrow-lark, although, unlike the previous example, both are complete moults; the usual moult is quite rapid and takes place after breeding, when the birds take advantage of the good food supplies following the rains, but the second is prolonged throughout the dry season. In these instances, too, the double moult is explained as an adaptation to the rapid wear of plumages which are exposed to wind, sand and the desert sun.

In general, it is certainly the case that recently moulted lark plumages tend to change appearance very rapidly, owing to bleaching and abrasion. This fact has in the past complicated and, sometimes, confounded taxonomic studies, as the recognition of subspecies depends on the availability and comparison solely of fresh-plumaged specimens.

A final aspect of lark morphology which cannot be overlooked is that of the bill, which is extraordinarily variable. As is logical, this huge variability is very closely related to the different feeding habits of the members of the family (see Food and Feeding). No other passerines, with the notable exceptions of the vangas (Vangidae) of Madagascar, "Darwin's finches" (Geospizinae) of the Galapagos Islands and the Hawaiian honeycreepers (Drepanididae), provide a better example of adaptive radiation with regard to this feature of morphology. Those alaudids which consume the greatest quantities of invertebrates possess a long, fine bill, often somewhat decurved, and sometimes specialized for unearthing insects and their larvae from sandy ground. The bill of the Greater Hoopoe-lark, at some 3 cm in length, is longer than the rest of the bird's head, and that of the Spike-heeled Lark and various *Certhilauda* larks is also noteworthy in this respect and is associated with soft substrates. In this context, an apparent relationship between the hardness of the ground and the comparative abundance of each species has been reported for the two *Galerida* larks found in north Africa: the longer-billed Crested Lark is more common on softer terrain and the shorter-billed Thekla Lark predominates on harder ground. Dupont's Lark, nevertheless, has a long, somewhat curved bill, but prefers firm substrates to sandy ones; this may be explained by its specialized feeding habits, since a large part of its diet, or at least that of the chicks, consists of ground-living spiders which the birds must extract from deep holes in the soil.

At the other extreme is the short, often conical and robust beak which is characteristic of the most granivorous genera, such as *Eremopterix*, *Spizocorys* and *Calandrella*, and which reaches its greatest development in the aptly named Thick-billed Lark. The latter's bill is some 13 mm deep at the base and about 20 mm long, both mandibles being strongly curved and reminiscent of the beaks of certain finches and buntings. Curiously, though, the mandibular musculature may not amount to much, judging from the weakness of the pecks delivered by individuals held in the hand.

A very interesting aspect of bill morphology concerns the sexual dimorphism which seems to exist in species such as the Spike-heeled Lark and the "long-billed" group, in which males have a relatively larger bill than do females. This difference is considerable in the case of the Raso Lark, the bill of the male being some 25% longer than that of the female, which is reflected in the observation that foraging males spend relatively more time



Most larks avoid active cultivation because crops quickly grow too tall for their taste. However, they are often attracted to agricultural land after harvesting because of the fallen grain and other food items to be found in stubble fields. They are also keen on ploughed areas where the soil has been turned over, and fallow areas where wild grasses are left to seed. Like many of its relatives, ***Erlanger's Lark*** *often visits these habitats, sometimes in large flocks, to take advantage of the rich food supply. Here it is pictured foraging on the dark soils of recently ploughed land in the Ethiopian highlands.*

[*Calandrella erlangeri*, Sululta plain, Ethiopia. Photo: Göran Ekström]

probing for food and less time turning over pebbles. The fact that the two sexes forage as if they were different species must have adaptive significance, probably permitting these birds to exploit more fully the limited resources of their living quarters, a tiny island in the Cape Verde Archipelago.

Habitat

Over their extensive geographical distribution, larks occupy a great diversity of habitats. They are found in African savannas, Asian steppes, Mediterranean scrub, Eurosiberian pastures and high mountain zones, among others, but most of them live in arid or semi-arid zones, such as deserts, steppes, savannas and thin scrub, where the annual precipitation ranges between 100 mm and 800 mm. In all these cases they occur in open, structurally simple environments which offer only low vegetation or, in a few instances, scattered trees, and which have a large amount of bare ground or areas of short grass, which allows them to search on foot for insects or seeds. Habitat selection by alaudids is also greatly influenced by relief, with flat or gently undulating areas being preferred, although some species, such as the Desert Lark, occupy rocky slopes. Larks tolerate climatic conditions ranging from those of extreme desert, with less than 50 mm of annual precipitation and temperatures which may exceed 50°C, as experienced by the Greater Hoopoe-lark, to very cold conditions, as occur in many of the northern and alpine regions inhabited by the Horned Lark.

Although many species nest at sea-level, others do so at high elevations. Thus, in Asia, the Bimaculated Lark (*Melanocorypha bimaculata*) occurs at altitudes between 1600 m and 2700 m, the Tibetan Lark reaches 4600 m in the western Himalayas, and Hume's Lark (*Calandrella acutirostris*), one of the most noteworthy examples, often breeds at or above 5000 m in Tibet. The Horned Lark ascends even higher, nesting up to the snow-line, at 5400 m, in the Himalayas. In Africa, the Large-billed Lark (*Galerida magnirostris*) is common above 3000 m in Lesotho, and it is not unusual to see the Horned Lark above 3000 m in the High Atlas of Morocco. The latter species exhibits a high degree of flexibility in its habitat choice in North America, perhaps because other larks are absent there; it can be found living from sea-level up to altitudes of 4000 m, and in regions varying from very dry ones, which receive less than 100 mm of annual precipitation, to very wet ones with over 1000 mm annually. The upper altitudinal limits of widely distributed northern species, such as the Horned Lark, tend to rise in the more southerly parts of their ranges, and this may be evident over quite short distances. In the Iberian Peninsula, for example, over a distance of barely 700 km from north to south, the Eurasian Skylark can be found nesting at sea-level in the north, mainly at 600-1200 m in the central tablelands, and only on mountain tops in the south, where it reaches 3500 m in the Sierra Nevada.

So, which habitats are particularly favoured by the Alaudidae? Certainly, the predilection of many larks for arid environments is well known and is reflected in the scientific names of various genera, in which combinations of the Greek words *chersos*, *eremos* or *ammos*, which refer to deserts or wastelands, and *philos* or *manes*, which indicate a liking or preference, appear. The available information shows that approximately three-quarters of the Afrotropical species, the most diverse assemblage, reproduce in such habitats, whereas only about a tenth occur in a wide range of habitats and scarcely a further tenth inhabit humid pastures. Among the north African breeding species, nearly half are associated with arid or semi-arid habitats, the remainder being equally divided between those which occur in a broad range of habitats and those which choose moist or fairly humid pastures.

Within this general pattern, different species respond in very diverse ways to a series of environmental factors, notably aridity, vegetation structure and the colour of the substrate. The effect of aridity on species composition in a lark community may be appreciated, for example, on the high plateaux of Morocco and Algeria, a region which is flat or undulating, of uniform altitude and without geographical barriers, but where there is a marked gradient of precipitation between the Mediterranean Sea and the Sahara. Here, ten or so species can be encountered over a distance of barely 200 km, among them the Eurasian Skylark and Dupont's Lark, which predominate in the rainiest zones, and Temminck's Lark and the Greater Hoopoe-lark, which are most frequent in the driest desert regions. Both in this region and elsewhere, it is notable that different species have distinct requirements in terms of vegetation cover and height. Accordingly, the Eurasian Skylark abandons cereal fields when these grow taller



In many regions, fire is a natural component of grassland ecology. To nesting larks these fires can spell disaster, but to foraging larks they are a boon. Insects and seeds are relatively easy to find where the vegetation has been destroyed, and thus some birds are attracted to grassland and shrubland fires. The ***Red-winged Lark*** *is one such species, often arriving in numbers only a few hours after blaze has died out. Fire seems to be especially important to Dusky* (Pinarocorys nigricans) *and Rufous-rumped Larks* (P. erythropygia), *which appear to nest almost exclusively in recently burnt areas.*

[*Mirafra hypermetra hypermetra*, Kenya. Photo: Arthur Morris]



Many larks will venture into rocky terrain, or defend territories in boulder-strewn regions, but they rarely forage directly on rocks. Although the ***Thekla Lark*** *is morphologically very similar to the Crested Lark* (Galerida cristata), *it tends to occupy more natural, and less meadow-like, habitats. It generally shuns agricultural landscapes, and prefers barren and rocky slopes, dry steppes, and shrubland on sandy soils. In foraging terms it has no special association with rocks, although it will take advantage of the panoramic view they afford by perching on them, as this photograph attests. This lark, and many others that are not particularly obsessive about displaying in flight, often sing from vantage points of this kind.*

[*Galerida theklae*, Ethiopia. Photo: Roland Seitre]

than 20 cm, Dupont's Lark prefers scrub 40-50 cm tall, the Red Lark (*Calendulauda burra*) selects tall scrub and grass but where the plant cover is only between 5% and 20%, and Rudd's Lark prefers grassland vegetation shorter than 70 cm. With regard to the type and colour of substrate favoured, the best example is perhaps that of the previously mentioned (see Morphological Aspects) lark community of the Kalahari, with six species of "red lark" typical of areas with reddish sandy soils and three "grey larks" in calcrete zones. The way in which substrate hardness is linked with the excavatory habits of certain species, and how this is connected with bill structure, has already been noted (see Morphological Aspects).

Most Europeans associate larks with pastures and croplands. Larks have, indeed, colonized to their advantage such places, not only in Europe but also in many other parts of the world. Pastures and crops, especially if not cultivated intensively, are a perfect equivalent to natural habitats for certain members of the family, which may achieve very high densities there. Moreover, the historical spread of cultivation has allowed larks to colonize new regions, leading to an enormous increase in the geographical spread and population size of a variety of alaudids; a good example is that of the Horned Lark, which underwent an impressive increase in North America at the end of the nineteenth century and at the beginning of the twentieth. Not all larks, however, have benefited in this way. If one considers those genera which contain the most species, *Calendulauda* and *Certhilauda* hardly make use of cultivation, and perhaps one eighth of *Mirafra* species do so regularly, as do about half of the members of *Eremopterix*, *Melanocorypha* and *Calandrella*. It is only in the genera *Alauda* and *Galerida* that a majority of species favour cultivated zones. In general, those larks which exploit agricultural land tend to be more granivorous and to be larger in size than the family average. Within farmland, it is also normal for larks to select fallow areas and crop stubble in preference to the crops themselves, a pattern which may be observed as much among African species, such as the Grey-backed Sparrow-lark, the Pink-billed Lark (*Spizocorys conirostris*) and the Large-billed Lark, as among Eurasian ones, such as the Bimaculated Lark, the White-winged Lark and the Oriental Skylark.

A frequent question examined by students of larks concerns the extent of overlap in habitat use that may exist between species which live together. In general, it may be supposed that differences in morphology and behaviour permit them to occupy different niches, but, on the other hand, the general adaptability of larks and the broad spectra of their diets suggest that such overlaps do exist and, as seems logical, occur to a greater extent between morphologically similar species. The norms of co-existence of the Crested Lark and the Desert Lark have been studied in the Negev Desert, in Israel. Of the two, the former is a larger, heavier bird and it has a longer beak which is better suited to insectivory. It seems clear that the two species are segregated by niche, but that there is also a degree of ecological overlap between them. While both are essentially seed-eaters, the Crested Lark takes a much wider range of seed sizes and it makes wider use of the available habitats, preferring sandy areas to the stony ones which the Desert Lark utilizes habitually, although some overlap occurs between them. Further, the Crested Lark seems to be more opportunistic, a fact which is also reflected in the greater variability of its population size, whereas the Desert Lark is more specialized and better adapted to desert conditions. In connection with this, the Crested Lark tends to carry larger fat stores than does the Desert Lark, perhaps because the latter's dietary specialization enables it to withstand periods of scarcity better than the Crested Lark, which has then to draw on such reserves to a greater extent. It may also be indirectly relevant that the generalist Crested Lark has a wider geographical distribution than that of the specialist Desert Lark.

The two *Calandrella* larks which meet in the Iberian Peninsula, the Greater Short-toed and Lesser Short-toed Larks, provide a good example of co-existence of two morphologically similar species. On a geographical scale, the relative abundance of the two is predictable in terms of such variables as vegetation cover, latitude, longitude and rainfall, whereas, at the level of micro-habitats, noticeable differences between them are evident in such parameters as vegetation height and structure. Nevertheless, the precise mechanisms by which the observed habitat differences between the two species are produced remain a matter for speculation; they may involve interspecific territoriality, colonial behaviour and dietary competition.

At times, dietary differences among alaudids are certainly important (see Food and Feeding) and, in association with differences in migratory habits, they may explain some instances



Most larks live in deserts or semi-deserts. In fact, three-quarters of Afrotropical larks breed in dry habitats. In the same region, only around 10% of larks are associated with a wide range of environments, and a similar number are associated with humid areas and croplands. Thus, in Africa, the epicentre of lark diversity, there is a strong association with deserts, semi-deserts and dusty or sandy grasslands. In Asia, the family is represented by far fewer species, but the pattern is similar. This photograph of a ***Short-tailed Lark*** *not only shows the dry, baked earth of its preferred habitat, but the unique big-billed and short-tailed profile which places it in a monotypic genus.*

[*Pseudalaemon fremantlii delamerei*, Rift Valley, Kenya. Photo: Michael Gore]

of niche segregation. Even so, it is hard to understand the large diversity of lark species which co-exist in such biomes as the South African Karoo, characterized though the region is by great variation in topography, substrate type and colour, climate and vegetation.

Another interesting but little-studied aspect of habitat selection by larks concerns habitat use at different seasons by those species with migratory habits. The movements of some such species involve occupation of different habitats during the breeding and non-breeding seasons. For example, the Bimaculated Lark nests on the Asian steppes but winters in sorghum (*Sorghum*) cultivation in the Sudan, and the Rufous-rumped Lark in Africa nests in open, broadleaf savanna woodland, pastureland and crops but spends the non-breeding period on arid savannas, where it selects recently burnt zones. Both in Europe and in North America, the Horned Lark passes the winter months on beaches and sand dunes along coasts. Nevertheless, these instances are exceptional, and most migratory larks seem to choose, throughout the year, habitats which are similar to those in which they breed.

General Habits

Most lark species are gregarious when on passage and outside the breeding season. Nevertheless, some appear to exhibit year-round territoriality and are seen only singly or in pairs even when not breeding, particularly Afrotropical species, such as Somali Long-billed (*Mirafra somalica*) and Friedmann's Larks (*Mirafra pulpa*), Pink-breasted (*Calendulauda poecilosterna*) and Sabota Larks (*Calendulauda sabota*), the Cape Long-billed Lark and the Large-billed Lark. A further variation is shown by Spike-heeled Larks, which apparently remain in tight-knit groups throughout the year, and have the interesting habit of keeping sentinels posted while other individuals forage.

Flocks of other members of the family vary considerably in size. Over a third of species occur typically in small groups of just a few individuals to a few dozen birds, but some regularly gather in considerably larger numbers. Flocks of hundreds or thousands of individuals occur among species of *Eremopterix*, *Melanocorypha*, *Calandrella*, *Eremophila* and, to a lesser extent, *Alauda*. Within the genus *Melanocorypha*, in which this behaviour is most marked, the Bimaculated Lark forms parties of some 200 individuals and sometimes as many as 3000, and White-winged Lark flocks usually comprise 30-100 birds but may contain 5000 on occasion; similarly, the Black Lark generally occurs in flocks of 500-1000 individuals, although winter aggregations of over 10,000 have been recorded. Even species which do not normally associate in big groups have been seen in large concentrations under adverse conditions, such as snowfalls, probably because snow-free areas in which to find food are then limited in extent. In Switzerland, for example, in an area of approximately 600 hectares in which 1000-2000 Eurasian Skylarks habitually wintered, as many as 5800 of these birds were counted after a



The ***Bar-tailed Lark*** *occurs in sandy deserts and wastelands, often where these are flat and pebbly. In Morocco, and elsewhere in the western Sahara, it prefers stone-clay* regs *(gravel plains with mixed sandy or grassy areas). It is largely sympatric with the closely related Desert Lark* (Ammomanes deserti), *but the latter species tends to occur in a wider variety of habitats, including rockier slopes and dry mountainous regions. Like most larks, the Bar-tailed is a restless creature when foraging; it rarely stands still for long, pausing only briefly between short scuttling bursts of running.*

[*Ammomanes cinctura arenicolor*, Morocco. Photo: Markus Varesvuo]





Larks have adapted rather better than most birds to extremes of aridity, and some of them live in truly inhospitable habitats. They are amongst the only passerines to thrive in the great deserts of the Old World: the Kalahari, Namib, Sahara, Thar and Gobi. The ***Dune Lark*** *is a denizen of the driest parts of the Namib, a harsh environment where few other species can survive. In fact, it almost never occurs in anything but sandy desert, although always in areas with at least some vegetation. Justifiably famed for its physiological adaptation to aridity, it acquires up to 47% of its water requirements through metabolic efficiency. When the water shortage is particularly severe, Dune Larks tend to eat more invertebrates, presumably as these contain a supply of water. They will also drink dew wherever nocturnal fog-banks have passed over the dunes. In the Sahara, the* ***Greater Hoopoe-lark*** *occupies a similar niche, foraging in desolate country and sandy plains, although it does venture into more densely vegetated areas. These two species are typical sand-dwellers: their relatively long bills are useful tools for digging in the soft substrate.*

[Above:
Calendulauda erythrochlamys,
Sossus Vlei, Namibia.
Photo: Josep del Hoyo/
Lynx Edicions.

Below:
Alaemon alaudipes alaudipes,
south Morocco.
Photo: Robin Chittenden/
FLPA]



Larks of high latitudes or altitudes are sometimes forced to forage in the snow. Some populations of the ***Horned Lark*** *breed in the Arctic, where snowfalls are not uncommon, and they survive by digging to search for seeds. During these conditions larks dig hollows or tunnels into the snow, sometimes as much as 30 cm deep, and there they roost. Using these strategies, Horned Larks can survive temporary snowfalls, but they cannot survive very low temperatures or prolonged snow cover. For this reason northern breeding populations are migratory, moving to southerly climes or lower elevations in the non-breeding season. Indeed, they often winter in coastal habitats, such as beaches, saltmarshes and dunes, where the chance of snow cover is minimized.*

[*Eremophila alpestris flava*, Finland. Photo: Markus Varesvuo]

snowfall, with another 9000 individuals in an adjacent area, together comprising some 25 flocks.

Larks generally form loose flocks in which they maintain individual distances of a few metres or a few tens of metres as they walk and feed on the ground or undertake short flights. Much more compact flocks are formed on migration or when predators are present, although these are never so tightly packed as are those of starlings (*Sturnus*), sparrows (*Passer*) and many other gregarious birds. Even so, a huge flock of 4000 Greater Short-toed Larks, recorded on passage in early April in the Arava Desert, on the Israel-Jordan border, appeared very closely knit; as the birds flew en masse from one patch of vegetation to another, they reminded one of the observers of a closely packed flock of small *Calidris* waders.

Concentrations of larks, in all parts of the world, often consist of several species, and often include members of other bird families. Thus, among those alaudids which have been observed to flock in winter or during the dry season, rather more than 40% form multi-species assemblages, a proportion which is likely to be much higher given that many species are still poorly known. The structural similarity between the component members of such gatherings is very variable, as is the number of species involved. *Eremopterix* sparrow-larks, which are morphologically quite similar, tend to associate with each other, for example, the Black-eared (*Eremopterix australis*) with the Grey-backed Sparrow-lark, and the Chestnut-headed with the Chestnut-backed (*Eremopterix leucotis*) and Black-crowned Sparrow-larks. Nevertheless, the participant species are in most cases morphologically dissimilar. Hence, the White-winged Lark, which weighs about 46 g, associates with the Black Lark, at 64 g a notably larger and heavier bird, and the Bar-tailed Lark forms flocks with Dunn's Lark, but also with Temminck's Lark and the Crested and Lesser Short-toed Larks, species from which it differs conspicuously in size and in bill type (see Morphological Aspects). Where birds of other families are involved, associations have been noted with the Corn Bunting (*Miliaria calandra*) and various finch species, such as the Eurasian Goldfinch (*Carduelis carduelis*); also, with Lark-like Buntings (*Emberiza impetuani*) by Stark's Lark and Black-eared and Grey-backed Sparrow-larks. In North America, the Horned Lark forms mixed winter flocks with such species as the American Tree Sparrow (*Spizella arborea*), the Dark-eyed Junco (*Junco hyemalis*), the Lapland Longspur (*Calcarius lapponicus*) and the Snow Bunting (*Plectrophenax nivalis*). The general observation is that such associations form among the most granivorous species, which may be interpreted as a response to the clumped distribution of seeds on the ground, in addition to being a type of anti-predator behaviour.

In contrast to their behaviour outside the breeding season, larks are territorial during the nesting season (see Breeding). This is well demonstrated, for all those species hitherto studied, by the striking songs of many and by the wing-flapping displays of others (see Voice).

As is already evident, larks are open-country birds (see Habitat). Many areas of open terrain take their form as a result of climatic aridity, and it is not surprising, therefore, that many members of this family are typical of arid zones and that some can be found in the world's most inhospitable deserts. It was long thought that these birds lacked physiological adaptations to desert life but, over the last twenty-five years, it has gradually become apparent that this is not so. Larks, in particular, offer interesting opportunites for such physiological investigations, since they allow comparisons, uninfluenced by phylogenetic considerations, of a diversity of species occurring in a range of habitats which differ widely in aridity. J. B. Williams and B. I. Tieleman have been able to demonstrate clearly that desert-dwelling larks expend less energy and lose less water than do those living in non-arid habitats. They compared the Greater Hoopoe-lark and Dunn's Lark, which inhabit the Sahara and the south-west Asian deserts, with the Eurasian Skylark and the Woodlark, which are widely distributed in the middle latitudes of the Palearctic Region. The first two were found to have metabolic rates which averaged 43% lower than those of the last two species; similarly, the desert in-



Some larks habitually perch in trees or tall shrubs. One such species is the ***Pink-breasted Lark*** *of East Africa which usually lands in acacias or thorn bushes when flushed. It lives in open savanna woodland or brushy areas, and is most easily located by its distinctive song, tirelessly repeated by males from a prominent perch. The rather slender bill and long tail of this lark make it seem somewhat pipit-like, and its plain pinkish face is distinctive. It was previously placed in the genus* Mirafra, *but genetic studies suggest that it belongs in the* Calendulauda *clade.*

[*Calendulauda poecilosterna*, Tsavo National Park, Kenya. Photo: Morten Strange]

habitants had a rate of evaporative water loss which was 27% lower than that of the Eurasian Skylark and Woodlark. Such characteristics would be of great adaptive value in desert conditions, where larks have to cope with intense solar radiation, often very high temperatures, low primary productivity and little or no access to drinking water.

The fact that desert-dwelling larks have very low levels of evaporative water loss had previously been demonstrated. For example, the loss rates of Stark's Lark and the Grey-backed Sparrow-lark, two species living in the Namib Desert of south-west Africa, were cited by E. J. Willoughby as being less than half of that which might be predicted for birds of those sizes. It remains unclear by what physiological means such rates are attained. The differences in metabolic rates have been related to changes in the relative sizes of the internal organs, in connection with their own energy demands and with the quantity of food which needs to be processed in different habitats and climates; logically, a lower amount would be needed in warmer and drier places. Physiological changes have been studied by monitoring two captive groups of Greater Hoopoe-larks, one group acclimatized at 15°C and the other kept at 36°C. After three weeks, the birds of the "cool" group had gained body mass, had significantly larger livers, kidneys and intestines, and had metabolic rates averaging 47 kJ per day, in contrast to the 33 kJ per day of the birds in the other group. So far as water-saving mechanisms go, two have been described for other birds of arid habitats: one is hyperthermia, allowing the body temperature to rise to approach that of the environment, thus reducing the need for evaporative cooling; and the other involves counter-current heat-exchange mechanisms in the nasal spaces. Neither of these would be very effective in the case of larks, as has been shown by laboratory studies. It is now thought that differences among alaudid species may involve differences in cutaneous water loss, related to variation in epidermal lipid composition and changes in cutaneous vascularization.

An additional method of conserving water is to reabsorb as much as possible from the urine and the faeces. Indeed, it has been demonstrated that the normal water content of the excreta of Stark's Lark and the Grey-backed Sparrow-lark is about 75% but that, when the birds are deprived of water, this can fall to little more than 50% and sometimes to as low as 25%. Be that as it may, it is evident that larks seem to need very little water. In fact, there are five species in the arid south-west of Africa which have never been seen to drink at all, and another, the aforementioned Grey-backed Sparrow-lark, which, although it visits water-holes in the wild, has proved in captivity to be capable of surviving indefinitely without water, living solely on a diet of millet seeds. Larks meet much of their water demands by metabolic oxidation of their food; the Dune Lark (*Calendulauda erythrochlamys*), also a Namib species, derives up to 47% of its requirements in this way. Much also is obtained from particular foodstuffs, notably insects and the green parts of plants, which may be sought with special dedication. The Dune Lark, for example, spends about a third of its foraging time in searching for invertebrates, which it must certainly seek in places distinct from those in which it obtains seeds. It seems, moreover, that invertebrates become more important in the diet at times of drought. In Pakistan in winter, when insects are not readily available, the Crested Lark turns to cultivated shoots of rape (*Brassica napus*) and chickpea (*Cicer arietinum*) plants during periods of severe drought, these being the only circumstances in which it is known to damage crops. In the African Kalahari, it is only the most granivorous lark species that visit drinking spots. Dew is another possible source of water in some places, and it is known to be used from time to time by the Dune Lark, which is otherwise famed for its physiological adaptations to aridity. It is also interesting to note that, under arid conditions, some alaudids are capable of drinking brackish water, as has been observed for the Black-crowned Sparrow-lark, White-winged, Black, Crested and Raso Larks, and Eurasian Skylarks.

Together with these sorts of adaptations, there is no doubt that appropriate behaviour is essential for desert larks if they are to avoid overheating and excessive water loss. Unlike mammals such as rodents, which emerge from their burrows only at night, larks are diurnal, but they concentrate their activities during the cooler hours of the day, around dawn and dusk. This is especially so with their foraging efforts and, in particular, their song flights, which demand high levels of energy expenditure (see Voice). Many species begin singing before dawn and again after sunset. In the Namib Desert, Gray's Lark, for example, performs most of its song flights in the period from two hours



No lark can properly be called a forest bird. The ***Woodlark*** *is one of the very few members of the family that comes close to qualifying for this category, but it is more a bird of clearings, heathlands and forest edges, preferring a mix of grassy glades and bare patches amongst shrubs and trees. Unlike most other larks, it often perches on high branches. In the traditional taxonomic sequence, the Woodlark occupies the monotypic genus* Lullula, *and this format is retained here. However, the basis for separating* Lullula *from* Alauda *seems flimsy on morphological grounds, and the best solution might involve a merger of these two genera.*

[*Lullula arborea arborea*, Silchester Common, Hampshire, England. Photo: Andy & Gill Swash]

before dawn until sunrise, with a second song period beginning 30 minutes after sunset. Nocturnal singing also occurs among temperate-zone species such as the Woodlark, which often sings on warm, moonlit nights.

With regard to foraging, a study of the Greater Hoopoe-lark in Arabia has shown that the birds forage for an average total of 5·5 hours daily, as opposed to 6·3 hours spent in resting. They foraged intensively for the first two hours after dawn, approximately from 06:00 to 08:00 hours, and during the last hour before sundown, from 17:00 to 18:00 hours. From 08:00 to 10:00 and from 16:00 to 17:00 hours, they foraged by moving from one patch of shade to another, with short intervening periods of rest or preening. The middle hours of the day were spent almost exclusively in resting. The experimental provision of supplementary food supplies demonstrated, however, that it is food shortage that obliges these larks to extend their foraging into the hotter hours of the day; those which had access to extra food not only reduced their foraging period, by between 13% and 29%, but also began and ended their rest periods at temperatures a couple of degrees lower than usual. It is curious that there is an apparent lack of time-budget studies for alaudids living in habitats other than deserts, but with these species, too, vocal activity and foraging occur mostly in the early morning and in the evening; the middle hours of the day, except in winter, are only partly spent in feeding and are otherwise devoted mainly to resting and plumage maintenance.

Inactivity at midday and the utilization of shade are widely employed strategies among larks, including those species in habitats which are not particularly arid, but there are other methods of combating the effects of heat. In 1957, J. A. Valverde noted that Thekla Larks in Western Sahara perch on bushes much more often than they do in Spain, and that they also choose high positions, well away from the overheated ground, in which they are exposed to the breeze, thus benefiting from a more favourable micro-climate. Similar behaviour has subsequently been recorded elsewhere, involving, for example, the Horned Lark in the Mojave Desert of California, USA, and both Stark's Lark and Gray's Lark in the Namib Desert of Africa. In Saudi Arabia, the Greater Hoopoe-lark cools itself by lying on mats of the tiliaceous plant *Corchorus depressus*. Similarly, in Kuwait, a further three alaudids, Dunn's Lark, the Bar-tailed Lark and Temminck's Lark, make use of *Citrullus colocynthis*, a prostrate plant of the family Cucurbitaceae having long roots which reach the water table and which can therefore cool itself by stomatal transpiration; in the Sahara, the temperature of its leaves has been found not to exceed 41°C when the air temperature has reached 54°C and the ground temperature is 70°C. Some other larks may find refuge from the midday heat in the burrows of other animals. For example, the Spike-heeled Lark in the Kalahari enters those of a ground squirrel, *Xerus inauris*, and in the Arabian Desert up to four species use the burrows of the large lizard *Uromastyx aegyptius*. Among these, the Greater Hoopoe-lark, the biggest species, seems to do so more than the others. The birds descend to a depth of 20-30 cm and remain there for about five-and-a-half hours each day during June and July, when the external air temperature can reach 45°C. Given that the temperature of the burrows does not exceed 41°C at midday, it has been calculated that this strategy may reduce the larks' evaporative water loss by over 80%.

Larks appear to roost at night on the ground. The roosting behaviour of the Crested Lark, in particular, has been well studied, but similar observations have been made on the Thekla Lark, the Greater Short-toed and Lesser Short-toed Larks and the Eurasian Skylark. Each bird uses its bill or legs to excavate a shallow depression of about half its own body size, and spends the night therein, as evidenced by the accumulation of droppings. The location of such roosting places is very variable; sometimes they are on totally bare ground and on other occasions they may be sited in the shelter of a small shrub. The distance between the roosting depressions is also variable, tending to be relatively great during the breeding season, but comparatively small when the birds are flocking in winter or in dry seasons. In the latter circumstances, inter-roost distances of 2-5 m have been noted for the Crested Lark and of only 10-15 cm for the Black Lark. The same depression may be used for several days, up to six consecutively in the case of a captive Crested Lark, but it is more usual for them to be abandoned after one day, especially if there is any disturbance or poor weather. Young Crested Larks construct and utilize roosting hollows from the age of about twelve days. Larks occasionally excavate sleeping hollows in snow, a habit which is well known for the Black Lark, and which has



Although larks are usually pair-living and territorial in the breeding season, they tend to be gregarious at other times of year. When the ***Horned Lark*** *abandons its montane or northerly breeding grounds each winter, it gathers in small flocks. These tend to be rather loosely packed, with a few metres separating foraging birds. In the photograph, however, these Horned Larks are visiting a water-hole in an arid landscape, and here they are packing together more tightly. For some lark species, flocks containing many hundreds of individuals have been recorded, and in the Black Lark* (Melanocorypha yeltoniensis), *Bimaculated Lark* (Melanocorypha bimaculata), *and some* Eremopterix *larks, these loose gatherings can run into tens of thousands; in the non-breeding season, equally impressive flocks of Greater Short-toed Larks* (Calandrella brachydactyla) *can be seen in North Africa and the Middle East. These dense congregations seem to be constantly on the move, especially in spring and autumn, propelled by low bounding flight across wide stretches of desert, cultivation and open water.*

[*Eremophila alpestris*, Washington, USA. Photo: Dave Maslowski/ Maslowski Productions]

also been reported for the Horned Lark and, occasionally, the Eurasian Skylark. The hollows made in snow by the Black Lark are 10-13 cm wide and 5-10 cm deep, usually reaching the ground surface. Those constructed by Eurasian Skylarks have been observed to be somewhat deeper, 20-30 cm, and to have a small terminal chamber.

Dust-bathing is a characteristic aspect of alaudid behaviour. Other passerines, such as sparrows and buntings, also dust-bathe fairly regularly, but the habit seems to be universal among larks, both those of arid and semi-arid zones and those of more northerly distribution. J. D. Delius has described the dusting behaviour of the Eurasian Skylark in some detail. For this species, the process follows a series of seven stages: first, the bird pecks at the ground; it then fluffs up the plumage, spreads the tail and drags the wings on the ground; after this, it uses its claws to excavate the surface, pushing the sand or soil outwards; the wings are then beaten against the ground; in the fifth stage, the lark scatters the soil with the bill; it then adopts a posture as if sun-bathing, remaining immobile for a short time; in the seventh, final stage it repeats the entire sequence. This behaviour is connected with the need to keep the plumage clean and also, perhaps, with the control of parasites. Interestingly, some lark species indulge in a similar sequence of movements and postures, but with the sand or soil replaced by snow, effectively snow-bathing.

Perhaps somewhat surprisingly, there appear to be hardly any reports of larks bathing in water, and such as there are involve very few species. This could be interpreted as one further adaptation of the family to arid environments.

Voice

The complexity and quality of lark song are as noteworthy as the birds' plumages are sober, a combination that is not uncommon among passerines. The possession of dull plumage, as necessitated by the general adaptation of the Alaudidae to steppe habitats and, especially, to nesting on the ground (see Breeding), may have led to a greater investment in song as a means of advertising individual quality among territorial males. This process has met with the problem that the habitats typically exploited by larks have few or no elevated songposts, such as trees or rocks, that would permit songs to be transmitted farther and would reduce the likelihood of singers being surprised by terrestrial predators. The solution is that larks, as a rule, sing in flight, notwithstanding the high energy costs involved. All of the Palearctic species, without exception, have song flights, and the same applies to the great majority of the African and Asian larks, although they may be lacking in some species of *Spizocorys* and *Mirafra*. In any event, there is no doubt that song flights constitute one of the behavioural traits which best characterize the family.

An excellent example of singing in flight is provided by the Eurasian Skylark, the vocal performance of which is surely also the best known and the most studied, given that its originator is a very common bird in the European countryside. The performing male rises silently into the wind and ascends to a height of between 10 m and 20 m before breaking into song. He continues to climb little by little, singing as he does so, following a spiral track and with the tail spread, to attain an altitude of about 100 m, and sometimes considerably higher; a study in southern Sweden, using an optical range-finder, found that the birds reach a height of 120 m on average, with a range of 31-210 m. At the peak of his lofty ascent the male lark remains, singing throughout, with wings flapping at 10-12 beats per second, until the moment of descent, which usually involves a parachute-like, gently spiralling glide on still, open wings. This descent may continue down to the ground, with the bird singing all the way, or may be cut short abruptly, ending with a dive on closed wings. The total duration of the display is very variable, but in general it is surprisingly long in comparison with the aerial displays of other birds. Different studies give average durations of between two and five minutes, but these timings depend in large measure on whether or not the tentative and frequently curtailed song bouts of the ascent are included. The duration is also influenced by the prevailing stage of the reproductive cycle, since the songs are considerably longer during the territory-occupation phase than during incubation and, especially, when the young are being fed. Song flights exceptionally last 10-15 minutes or even longer; in England, 57 minutes was recorded on one occasion and 68 minutes on another, such virtuoso exploits being hard to imagine.

So far as is known, there are no data available on the energy costs of song flights, but no doubt these are very considerable and the birds' behaviour seems designed to reduce them as much



Dust-bathing is a common feature of lark behaviour. It has been reported for most species in the family, and it seems likely that no group of passerines spends more time dust-bathing than larks, with the possible exception of sparrows (Passer). *Before indulging in their characteristic dusting and sunning behaviour, larks choose a warm, open, sunlit spot, as demonstrated by this* ***Bimaculated Lark***. *Here, they fluff up their plumage, spread their wings against the ground, and sometimes flutter dust onto their feathers. This behaviour probably functions in maintaining plumage quality, and reducing parasite load.*

[*Melanocorypha bimaculata*, Sohar, Oman. Photo: Hanne & Jens Eriksen]



*Many larks live in hot, dry places where physiological and behavioural thermoregulation is essential. To avoid overheating, this **Spike-heeled Lark** opens its bill, the normal avian version of panting. This species often spends the middle of the day resting in the shade, sometimes in the underground burrows of terrestrial mammals. In general, larks adapted to arid environments show low levels of energy expenditure and evaporative water loss, characteristics which allow them to cope with a shortage of drinking water and an excess of solar radiation.*

[*Chersomanes albofasciata*, Kalahari Gemsbok National Park, South Africa. Photo: Andy & Gill Swash]

as possible. The aforementioned Swedish study, undertaken by A. Hedenström, determined that the skylarks flew at an optimal speed of some 6 m per second and that they were obliged to circle to maintain height only when wind speeds were lower than that figure; at higher wind speeds, they could maintain station with minimal exertion by facing into the wind. Song-flight duration has been found to have a positive correlation with the length of time spent on the ground immediately afterwards, the birds apparently recuperating after their exertions. It has also been shown that an experimental reduction in wing area leads to shorter song flights.

All in all, it seems evident that the most significant feature of the aerial display of the Eurasian Skylark is its total duration. The staying power of males appears to be the principal indicator used by them in order to advertise their reproductive quality and competitive status to females and rival males, respectively. From an evolutionary standpoint, the length of song flights may be regarded as subject to sexual selection, being a characteristic which has been elaborated upon and exaggerated, in the same manner in which other birds have developed size and plumage distinctions and other forms of behaviour. The question arises, therefore, of the extent to which song-flight endurance can be taken as an "honest" signal, one which is not susceptible to cheating by those males which are in reality inferior to the image which they present of themselves. The evolution of such a feature as a lengthy song flight seems to be accompanied by others which serve to reduce its energy costs, in this case the development of a larger wingspan and a greater wing-and-tail surface area, a distinction which is already evident between males and females. Selection for such cost-reducing traits, the employment of which is more economical than is that of elaborate sexual displays, would seem to facilitate cheating, whereby poor-quality males could pass for what they are not. It appears, however, that this does not apply in this particular instance, as A. P. Møller has shown that, although many individuals with poor displays do have relatively large wingspans, suggesting that they benefit from energy-saving features, it is also the case that the individuals with the longest song flights have the largest wingspans. In other words, the possession of cost-reduction traits such as large wings does not allow poor-quality individuals to offset the costs of protracted song flights, the key indicator of fitness, to the extent seen in genuine high-quality birds. The signal remains honest, therefore, in that the evolution of energy-saving measures is followed by that of a higher quality of display, which itself serves to augment the costs involved, and these higher costs can be met only by the fitter individuals.

It is the essential honesty of this signal that perhaps permits it to be employed effectively in a very different context, that of anti-predator behaviour. A Scottish study of the reactions of Eurasian Skylarks to attacks by Merlins (*Falco columbarius*), carried out by W. Cresswell, showed that the larks may use their songs as a pursuit-deterrent signal. The observer found that the falcons pursued for longer periods those larks which did not sing when fleeing, and they also chased poor singers more than they did the more accomplished ones. In this instance, song is serving as a pointer to body fitness and gives the Merlins a reliable indication of the relative likelihood that an attack will succeed.

So far, nothing has been said about the quality of the song of the Eurasian Skylark, which has been much exalted by poets (see Relationship with Man). It is, indeed, an unending and inspiring melodious stream of clear and well-modulated trills and warbles. Above all, the listener's attention is drawn to the way in which the phrases appear to follow one another so smoothly, and seemingly without pause. If the song is recorded and analysed from sonagrams, however, its continuity is found to be more apparent than real; there are, in fact, distinct phrases separated by brief pauses, perhaps corresponding respectively to the expiratory and inspiratory phases of respiration. The phrase/pause pattern is independent of the wingbeat pattern, which is much faster. Phrase lengths are variable, but there are usually fewer than four per second. The pauses are so short, lasting only 0·03-0·1 seconds, as to be undetectable by the human ear. Sonagrams reveal that within each phrase there are pulsatory bursts, at times with the elements tightly packed but at other times less so, which suggests that respiratory oscillation of the airflow is superimposed on cycles of contraction of the syringeal musculature. Another curious revelation from the sonagrams is that the range of vocalizations is relatively limited, even though these are combined in an enormous variety of different ways, with little repetition. It is very probable that sexual selection has influenced song continuity, song structure and other aspects of these vocalizations, as has been demonstrated for various other bird species. In this

connection, it is interesting to note that female Eurasian Skylarks also sing, both from the ground and in flight, although their songs tend to be quieter, more monotonous and more fragmented than are those of the males.

In common with many other avian families, the Alaudidae often incorporate imitations of other birds, and sometimes other types of sound, into their songs. There is the intriguing instance of a Crested Lark in Germany which was observed to imitate the whistles by which a shepherd controlled his sheepdog; so good was its mimicry that the dog was found to respond appropriately to recordings of the bird. At least as remarkable is the case of a Rufous-naped Lark in Kenya which, while on the ground, uttered exclusively its imitation of the Abyssinian Nightjar (*Caprimulgus poliocephalus*), instead of its own song; this resulted in days of perplexity among the ornithologists who found the bird, and who were baffled at having apparently located a nightjar which sang by day. The Eurasian Skylark mimics the voices of some birds, among them waders such as the *Tringa* species and *Charadrius* plovers, and those of the introduced Australian population have been known to imitate psittaciforms such as the Galah (*Eolophus roseicapillus*) and the Blue-winged Parrot (*Neophema chrysostoma*), but this lark is not especially celebrated as a mimic. Mimicry is better developed in larks of the genera *Melanocorypha* and *Calandrella*. The song of the Calandra Lark, for example, includes continuous, frequent and convincing imitations of a whole range of species; in central Spain, these may include the Common Quail (*Coturnix coturnix*), the Greater Short-toed Lark, the Crested Lark, the Barn Swallow (*Hirundo rustica*), the Spotless Starling (*Sturnus unicolor*), the Eurasian Goldfinch, the Eurasian Linnet (*Carduelis cannabina*) and many others, indeed practically all of the species that share the Calandra Lark's habitat. Some of the African *Mirafra* species, including the Red-winged Lark and the Melodious Lark (*Mirafra cheniana*), seem to be as good or even better at mimicry. For the former, imitations of 20 species were identified in fifteen minutes of recordings from Tsavo National Park, in Kenya, and a single 12-second phrase comprised imitations of five species intermixed with the lark's own whistles. The Melodious Lark, a southern African species, has been credited with imitating at least 57 species, drawn from some twenty different families.

The existence of song flights has paved the way for other kinds of display which, while not strictly vocal, may come to be as effective as song in the contexts of sexual and territorial advertisement. In such activities many larks employ them to a greater or lesser extent. The aerobatics which embellish the celebrated fluting song of the male Greater Hoopoe-lark provide a particularly good example (see Breeding).

Finally, flight provides the opportunity to produce sounds other than vocalizations, as it does with some other groups of birds. With the Alaudidae, these non-vocal sounds are due to the striking together of the wings on the downstroke. Such sounds have been noted for a range of species from different genera, including *Melanocorypha*, *Chersophilus* and *Heteromirafra*, but it is the larks of the genus *Mirafra* in which they are most widespread and in which they are used to the most spectacular effect. Wing-clapping is generally combined with vocalizations, but in three African species, the two clapper larks and the Flappet Lark (*Mirafra rufocinnamomea*), wing sounds predominate to such an extent that it was long thought that the Flappet Lark produced no song at all, although some individuals are now known to do so. As this last species cruises more than 100 m above its woodland territory, its wingflaps are audible over hundreds of metres, and are at least as loud as the vocalizations of other larks. The wing noises are delivered in bursts, the duration and pattern of which vary from place to place and comprise a sort of local "dialect" which remains constant for long periods at a given site, and which is equivalent to the song dialects of other birds. The wingflaps are produced at a frequency of 24 per second, twice as many as in normal flight, indicating that the displaying males incur a very high energy cost, perhaps 16 times greater than their basal metabolic rates. This kind of display is likely, therefore, to be a more than honest indicator of the relative quality of individual males. Of the half-dozen or so wing-clapping larks, the Cape Clapper Lark (*Mirafra apiata*) is the only other one in which the flap rate accelerates greatly during the display. Maximum wing-clap rate varies less than do other display characteristics, with very little variation among the fastest-clapping males, suggesting that there is direct selection for fast clapping.

Aside from songs and mechanical sounds, alaudids do, of course, have a number of vocalizations which they use in differ-



During aggressive interactions or territorial disputes larks tend to hold their wings away from their bodies. They also fluff up their plumage and those that have crests, like this ***Eurasian Skylark****, raise them. This all goes to make them seem as large as possible to their rivals. It is rare for confrontations to develop beyond this stage, but longer-billed larks sometimes grasp each other's bills and tussle on the ground. More often than not, one contestant rapidly concedes and the victor gives chase. In many species, the wing-out display is similar to the postures seen during initial stages of courtship, wherein the wings are drooped and quivered.*

[*Alauda arvensis cantarella*, near Ankara, Turkey. Photo: Hanne & Jens Eriksen]



In sharp contrast to their muted plumage, most larks have conspicuous, distinctive and often beautiful songs. This ***Dupont's Lark*** *is singing from a low perch; the species also performs a song flight, which is of varying duration. Although it sings chiefly around dawn and dusk, it can sing almost throughout the night in spectacular fashion. In the daytime, singing males rise to great heights, sometimes 100-150 m above the ground, where they can deliver prolonged bouts of song. The song itself is a short, powerful and melancholy phrase that carries well across the favoured habitat of this species, the shrub-steppes of Spain and North Africa.*

[*Chersophilus duponti duponti*, Navarre, Spain. Photo: José Luis Gómez de Francisco]

ent behavioural contexts, as, for instance, when flocking. These calls, however, do not appear to differ in any substantial or significant way from the corresponding calls of many other passerines. The repertoire of the Eurasian Skylark, presented in a well-known study by Delius, serves as a typical example. In addition to its songs, this species has at least eight other types of vocalization. A rapidly repeated "tschrr tschrr" is given by the male in advertising display, a quiet, hoarse "gjj gjj" is uttered in threat, a rapidly repeated "schrr" and a plaintive, drawn-out "juu" are contact calls, and a repeated soft "tju tju" is a feeding call. The flight call is a liquid, rippling "tschirit", sometimes transliterated as "chirrup", the latter being a common human spelling of the calls of many bird species. The other vocalizations of the Eurasian Skylark are "tlütütü tlütütü", given by a disturbed individual during brood-rearing, and "iuiu iuiu", which is the food-call of the young.

Food and Feeding

Despite the existence of noteworthy interspecific differences in bill morphology (see Morphological Aspects), the diet of adult larks in almost all cases comprises seeds and invertebrates, although the relative importance of these differs among species. Green vegetation is also taken frequently, as are, to a lesser extent, small bulbs and fruits. Thus, of the 70 or so species for which dietary details are reasonably well known, about 70% consume a mixture of seeds and invertebrates, some 20% additionally eat green vegetation, and only about 10% are specialist insectivores or seed-eaters, although even these last may occasionally consume other material. In nearly all cases, the nestlings are fed exclusively on invertebrates, the few exceptions being found among the most granivorous species, such as Stark's Lark, which feed even tiny young on the seeds of herbaceous plants.

A great diversity of invertebrate groups is represented in the alaudid diet. In addition, certain species, such as the Greater Hoopoe-lark, have been seen to capture small reptiles on occasion. The invertebrate prey normally consists of arthropods, but small or medium-sized snails and other invertebrates are also taken. The contribution made to the diet by different kinds of invertebrate seems to reflect the local abundance of each, in keeping with the generalist nature of most alaudids. Thus, Afrotropical larks rely heavily on termites (Isoptera) and also, to a lesser extent, on ants (Hymenoptera), despite the chemical defences of the latter, although other arthropods, including beetles (Coleoptera), grasshoppers (Acrididae) and spiders (Araneae), are also well represented in their diets. Orthopterans and beetles predominate in the diet of north African species, although ants are also taken by the Greater Hoopoe-lark and the Desert Lark.



The songs of the genus Eremopterix *tend to be simple affairs. They are usually repetitive series of twittering or buzzy notes. They are sometimes given in high song flights, but are more commonly produced from the ground or low perches, as shown here by an* ***Ashy-crowned Sparrow-lark****. Apart from advertising signals, larks tend to have a fairly wide variety of quieter secondary vocalizations used in flight, when flocking or during agonistic encounters. Flocks of* Eremopterix *larks, for example, give a chorus of finch-like chipping or twittering notes when flushed from the ground.*

[*Eremopterix griseus*, India. Photo: Gertrud & Helmut Denzau]



*The song of the **Rufous-naped Lark** is a short and simple three- or four-note phrase monotonously repeated every 2-20 seconds. After about 20 repetitions of one particular phrase, the bird switches to another call type. On this occasion the male is singing atop a bush, but he sometimes performs a short song flight. Not infrequently, especially when excited, he also rattles his wings immediately prior to singing. Mechanical noises such as this are common in larks, with some species basing most (or all) of their advertising signal on wing-clapping rather than vocalizations. Mimicry is rare in the Rufous-naped Lark, but the norm in some of its relatives. In common with all oscines, larks learn their songs when they are young. According to one report, however, they sometimes listen to inappropriate tutors: at a site in Kenya, a Rufous-naped Lark had learned the song of the Abyssinian Nightjar* (Caprimulgus poliocephalus)*, and it repeated this phrase incessantly.*

[*Mirafra africana athi*, Masai Mara National Park, Kenya. Photo: Ferrero-Labat/ Auscape]



*Of the various larks that perform prolonged song flights, the **Eurasian Skylark** is the most famous. A prominent feature of the European spring, its aerial displays have long inspired poets and musicians. For minutes on end they pour out a medley of notes, trills and warbles, sometimes from so high in the air that they are hardly visible. Much as this "flood of harmony" is uplifting to humans, it has a practical function: showing off. The available evidence suggests that females can judge the quality of males by the duration of their song flights, and can thus use these flights to guide their mating decisions.*

[*Alauda arvensis*, Dogubayazit, Turkey. Photo: Hanne & Jens Eriksen]

For four lark species studied in the Iberian Peninsula, namely the Crested and Thekla Larks, the Eurasian Skylark and the Woodlark, beetles comprise the majority of arthropod prey, although grasshoppers, ants, caterpillars and spiders are also included. The seeds taken by larks range in size from cereal grains down to the very tiny ones, and the range of plant species exploited is very broad. Most are grass seeds (Poaceae), but sometimes the seeds of shrubs, weeds or cultivated plants predominate. In common with many other birds, all those larks which are at least partially granivorous also ingest small stones in order to facilitate the breaking-down and digestion of the seeds.

There are sometimes sexual differences in the diets of larks. As already noted, male larks are larger than females, the differences in body sizes and bill lengths being more marked in insectivorous species than in the seed-eaters (see Morphological Aspects). Hence, intersexual dietary differences may logically be expected to exist. In the case of the Spike-heeled Lark, which has been studied in the Namib Desert, the males feed mainly upon tenebrionid beetles and the females on ants and harvester termites. Males of the Raso Lark, which are more given to digging for food, consume more bulbs than do the females, which have a more insectivorous diet.

Another important factor of variation in alaudid diets is the season. Not only are the chicks of nearly all species totally insectivorous but, at least among the Holarctic members of the family, the nesting adults, too, take mainly insects. Data on Spanish Thekla Larks illustrate the progressive dietary change during the course of the breeding season: in April, arthropods comprise 70% of the stomach contents in terms of volume, 20% being seeds and the remainder stones; in May, seeds predominate in some stomachs and invertebrates in others; in June, arthropods make up only 8% of the stomach contents, with seeds representing 60% and green matter 13%. Such seasonal differences seem to be related to the energy content of the different components and to the need of individuals for water. R. E. Green has shown that Eurasian Skylarks in England, after the harvest has taken place, prefer cereal grains to green matter, although they continued to eat other food even when the former were abundant. Green matter, which is comparatively low in energy, dominated in the winter diet, when cereal grains were scarce, although the larks appeared to select fields mostly according to the density and size of the available cereal grains. It seems, therefore, that green vegetation usually comprises a secondary element in the diet, although for desert species, and during periods of drought, it may be important as a source of water.

Given that larks in general have a mixed and varied diet of seeds and insects, it is not surprising that many of them are often seen to explore the dung of herbivores. This material contains numerous undigested seeds, of a considerable variety of sizes, and harbours the adults and larvae of coprophagous beetles, which can be extraordinarily abundant in places where livestock is not treated against digestive parasites or where large wild ungulates occur. Such behaviour has been reported for at least seven genera, with species including the Rufous-naped Lark, Karoo Lark, Dusky Lark, Gray's Lark, Desert Lark, Red-capped Lark (*Calandrella cinerea*) and Crested Lark. The investigation of dung may be habitual among species with a bill morphology suited wholly or partly to insectivory.

The foraging behaviour of larks takes a variety of forms and is related to the morphology of the species. The most granivorous alaudids, with the shortest bill and legs, move slowly while searching the ground meticulously for seeds. The insectivorous ones, with long bill and legs, often run from place to place or, where the substrates are soft enough, dig for insects. It is amazing to watch the Greater Hoopoe-lark as it extracts beetle larvae from the sandy accumulations, known as *nebkhas*, which form in the lee of small desert shrubs; the bird digs furiously and determinedly to a depth of up to 5 cm, leading one to wonder how it is that the lark detects the prey in the first place. Bulb-eaters, such as the Short-tailed Lark (*Pseudalaemon fremantlii*) and the Large-billed Lark, also dig for their food, and the Raso Lark excavates down to 6 cm in order to unearth the bulbs of *Cyperus bulbosus*. Species of snowy regions will also dig through the snow to reach seeds, as does the Black Lark, which excavates tunnels up to 15-20 cm deep, sometimes with side branches.

There are some other styles of foraging behaviour which appear quite specialized. The Karoo Lark, which often digs in sand, seeks termites in the excavations made by the aardvark (*Orycteropus afer*), a mammal with which it associates; the Eastern Clapper Lark occasionally does the same. Dupont's Lark hunts tarantula spiders (*Lycosa*) in their burrows, which are often quite deep and narrow, by inserting its long beak and often also its neck, assuming a leg-up and tail-up posture which recalls the upending behaviour of dabbling ducks (*Anas*). Various alaudids, such as the Raso Lark and Temminck's Lark, use the bill to turn over pebbles in search of insects hidden beneath; the latter spe-





The diet of all larks consists almost entirely of seeds and insects, in varying proportions, depending on species and season. Here we see a ***Rufous-naped Lark*** *carrying a praying mantis, and a* ***Greater Short-toed Lark*** *holding a small worm in its bill. As these images attest, mantids, annelids, and a range of other insects and invertebrates, are eaten by larks, but in almost all cases they are captured more intensively during the chick-rearing phase than at any other time in the life-cycle. In other words, when adults are not breeding, they probably rarely forage on such large living prey. In some cases, even bigger prey is tackled. The Greater Hoopoe-lark* (Alaemon alaudipes) *has been observed capturing and consuming small vertebrates, such as reptiles, on occasion.*

[Above: *Mirafra africana transvaalensis*, Stone Hills Game Sanctuary, Zimbabwe. Photo: J. R. Peek.

Below: *Calandrella brachydactyla brachydactyla*, Alicante, Spain. Photo: José Ruiz/Nature Picture Library]



Larks typically detect food items by sight, and pick them from the surface using their bills. Many species, however, dig to reach invertebrates or bulbs, and in this case the food must be located by touch. The ***Sabota Lark*** *is mainly granivorous, but it eats invertebrates when it can, as shown here. Like most larks, it knocks large insects against the ground to break them up into smaller pieces. Interestingly, bill morphology varies between races of this species, and races with bigger bills tend to spend more time digging for food; the bird seen here is one of the larger-billed, western forms.*

[*Calendulauda sabota waibeli*,
Etosha National Park, Namibia.
Photo: Rolf Kunz]

cies is known to turn over stones as heavy as its own body. Particularly remarkable is the use of stone "anvils" on which to smash snails before ingesting their soft contents, an activity which has been much studied in the Song Thrush (*Turdus philomelos*) and which has also been described for a number of lark species, including the Crested Lark, the Thekla Lark and the Greater Hoopoe-lark. The feeding style of the Thekla Lark is very similar to that of the Song Thrush. The lark grasps the snail by the shell rim and then smashes it against a small rock in a series of rhythmic sideways blows until the shell breaks, usually along its upperside, upon which the bird seizes the snail's foot in its bill and shakes it brusquely to complete its extraction. Individual Thekla Larks select particular rocks to be used as anvils, as evidenced by the piles of accumulated shell fragments, but they also choose particular snail species according to size and to the hardness of their shells. Hence, the birds in the study area selected only one out of three available snail species, and they took only the smallest individuals of this one. Such selectivity has not been noted among Song Thrushes, and it may be due to the fact that Thekla Larks are considerably smaller birds. The much larger Greater Hoopoe-lark smashes snails by dropping them from heights of up to 25 m, although it also uses anvils when dropped snails fail to break.

Larks are by no means the only seed-eaters that occur in deserts. The gerbils (Gerbillinae), small mammals inhabiting north Africa and the Middle East, are predominantly granivorous and may be supposed, therefore, to be in serious competition with alaudids. Their interactions have been studied in Israel, in the Negev Desert, where the Crested Lark co-habits with Allenby's gerbil (*Gerbillus allenbyi*) and the greater Egyptian gerbil (*G. pyramidum*). A series of experimental trials was carried out in a variety of micro-habitats and substrates, employing baits consisting of seeds mixed with sand, and with seed densities recorded before and after foraging had taken place. This revealed that, when seed densities were very low, the gerbils were more efficient at extracting seeds than were the larks. In theory, Crested Larks could compensate for their relative inefficiency in two ways. On the one hand, and given their mixed diet, they could switch to other prey types when seeds were too scarce to be worth harvesting. Alternatively, they could employ their much greater mobility to locate patches with higher seed densities or to visit habitats, such as rocky hillsides, which gerbils seldom or never exploit.

Breeding

The breeding habits of the Alaudidae, although subject to notable exceptions, may be summarized by stating that: the members of this family are monogamous and territorial; they breed as isolated pairs or in loose colonies; their nests are constructed on the ground, by the females; clutch size varies considerably; the eggs are incubated usually by the females alone; the chicks grow very rapidly and are fed by both sexes; losses of eggs and nestlings are high; and the young depend on their parents for a relatively long period after fledging.



For most members of the family, seeds are a staple. Larks tend to eat a variety of grain sizes, from cereals down to tiny seeds. Most are grass seeds, but seeds of large bushes, small shrubs, and cultivated plants, are also commonly taken. Most seeds are eaten from the ground, this being because larks do not usually perch on the stem of grasses, unlike many granivorous emberizids. The only time they strip seeds from the parent plant is when the stem is very short, allowing the seed-head to be reached from the ground, as shown by this ***Black-crowned Sparrow-lark****.*

[*Eremopterix nigriceps melanauchen*,
Oman.
Photo: Markus Varesvuo]





Many larks dig for their food, but those that dig most avidly are species of sandy deserts, such as the ***Dune Lark****. Because of their habit of sifting through sand for prey, larks adapted to soft substrates tend to have longer bills than those living on harder ground. The longest bill of all belongs to the Greater Hoopoe-lark* (Alaemon alaudipes)*, a species that often digs several centimetres into sand to reach food items. It regularly searches for seeds and insects hidden in banks of sand that build up on the windward side of desert shrubs. Some other dry-country species with shorter bills, such as the Raso Lark* (Alauda razae) *and Temminck's Lark* (Eremophila bilopha)*, habitually flip over stones when foraging. The latter species has been known to turn stones heavier than its own body weight. Perhaps the most remarkable digging feats are performed by larks in deep snow: they sometimes dig burrows 15-20 cm deep to reach the ground, and then tunnel under the snow in search of food.*

[*Calendulauda erythrochlamys*, Sossus Vlei, Namibia. Photos: Josep del Hoyo/ Lynx Edicions]



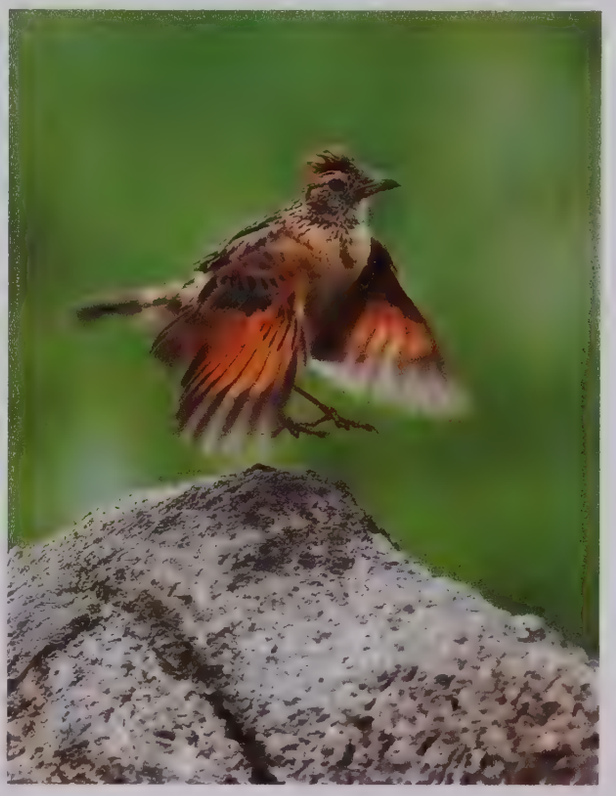
In dry conditions many larks visit sources of water to drink, probably on a daily basis. This generalization is most accurately applied to species of semi-deserts and grasslands, such as the ***Calandra Lark****. It also tends to be true of species with a high proportion of grain in their diet. Conversely, species that eat insects and green vegetation rarely drink, and larks of true deserts are well adapted to the arid environment. Through a variety of behavioural and physiological strategies, including a highly efficient metabolism, many of them appear to spend their entire lives without ever needing to drink water.*

[*Melanocorypha calandra calandra*, Belchite, Spain. Photo: Jordi Bas]

Whereas many larks are gregarious outside the breeding season, all are territorial when nesting, as indicated by their singing behaviour and, in some cases, their wing-flapping displays (see Voice). Nevertheless, the spatial distribution of territories indicates that many gather to breed in defined zones, forming what may be considered loose colonies. Such a pattern has typically been recorded for mainly granivorous species, including Black-eared, Chestnut-backed, Black-crowned and Grey-backed Sparrow-larks, as well as for Dupont's Lark, the Calandra Lark, Greater and Lesser Short-toed Larks, the Horned Lark and Sclater's Lark (*Spizocorys sclateri*). Others, such as all members of *Certhilauda* and most of *Calendulauda*, in addition to the Eurasian Skylark, the Crested Lark and the Thekla Lark, which are typically more insectivorous, have their territories evenly spread and well spaced. The existence in some species of intraspecific gregariousness in the breeding season poses certain questions. The underlying reason for this behaviour has been explained by two factors, which are not mutually exclusive: the existence of sharp differences in habitat quality; and defence against predation. Although the open terrain which larks inhabit may appear homogeneous, there are in fact often major differences in vegetation structure between areas which may be only tens or hundreds of metres apart. In addition, the rainfall patterns in arid and semi-arid regions can be extremely irregular, and it is the rains that determine food availability. Larks will tend to concentrate in the most "valuable" habitat patches, those in which they are likely to attain the highest reproductive success. As regards anti-predator defence, the benefit of forming loose colonies comes from the shared vigilance and alarm displays which make it less likely that nests or adults will be attacked by predators, thus again increasing overall breeding success. In general, lark nests suffer heavily from predation, which may include the loss of the incubating adults.

Factors which determine the onset of breeding by desert-dwelling larks differ from those applicable to larks of temperate climates. The rains are the trigger to nesting by the former, whereas northern species are more influenced by temperature. Relatively little is known on this subject with regard to Asian and Mediterranean species.

Larks of desert habitats nest during the rainy seasons, when primary production is much higher and insects are at their most abundant. A southern African species, Sclater's Lark, provides a good example. Its preferred food is the seeds of eight-day grass (*Enneapogon desvauxii*), so called because it germinates, grows, flowers and sets seed in just eight days after the onset of the rains, and the reproductive cycle of this lark species is geared to the development of this plant. Nevertheless, reproductive strategies differ from one species to another. In the Namib Desert, Willoughby found that the Spike-heeled Lark, which is sedentary and predominantly insectivorous, has no seasonal pattern to



In common with most members of the family, the male ***Rufous-naped Lark*** *spends much of the breeding season defending its territory or advertising for mates by singing and displaying. Of the various displays used by larks, a small hop into the air from a prominent perch is unique to certain members of the genus* Mirafra. *This hop, captured here, is accompanied by an audible whirr as the bird flutters its wings. It often serves as a precursor to songs or displays, and it is sometimes given in series during longer song-bouts.*

[*Mirafra africana africana*, Ngoye, Kwa-Zulu Natal, South Africa. Photo: Andy & Gill Swash]



Unlike many desert species with patterns of breeding tied to fluctuations in rainfall, ***Stark's Lark*** *has a fixed cycle of gonadal development so that it always breeds in the late summer or autumn. It achieves this constancy by dispensing with a fixed breeding range. Instead, it is nomadic and nests wherever sufficient rain has fallen. As in most larks, the female builds a cup-shaped nest in a suitable depression, sometimes in the open, but more often sheltered by vegetation. In this case, a small clump of grass provides a modicum of camouflage and shade. The genus* Spizocorys *contains six African species, all with dull plumage and finch-like bills.*

[*Spizocorys starki*, near Brandvlei, Bushmanland, Northern Cape, South Africa. Photo: Peter Steyn/Photo Access]

its gonadal development and in its moult, but instead reproduces opportunistically in response to local rainfall. A somewhat different strategy is exhibited by Stark's Lark and the Grey-backed Sparrow-lark, which are nomadic and largely seed-eaters. These two species have an endogenous cycle of gonadal development and moult which is coupled to the rains, so that they tend to nest mainly in late summer and in autumn. Their nomadism makes this possible, since they are able to move rapidly to areas which have received rain. Similar observations have been made in the Kalahari Desert. Nevertheless, the same species may or may not display gonadal cycles, and the Grey-backed Sparrow-lark does not show them in the Kalahari.

The onset of breeding in desert habitats is linked to the quantity of rainfall, and the birds are able to respond very rapidly to appropriate amounts of precipitation. The resident insectivorous larks of the Namib require a minimum of 20 mm of rain for nesting to be triggered, and they are able to begin such activities just seven days after heavy rain. The nomadic seed-eating species require up to 40 mm and they begin nesting two weeks after rain, although this may be delayed for a couple of months, depending on how the vegetation develops. Reproduction is influenced not only by rain but also by temperature, the latter also affecting productivity in desert ecosystems; high temperatures encourage rapid plant growth but the vegetation may be short-lived, whereas low temperatures will reduce plant growth rates and can delay egg-laying. Temperature, through its effects on the endurance of desert plants, can also determine the length of time over which breeding activity lasts; high temperatures may curtail the season and may lead to a high rate of nest abandonment.

Larks, being territorial, have traditionally been regarded as strictly monogamous. This does, indeed, seem to be the case for the Eurasian Skylark, which shows a high level of mate-fidelity from one season to the next. Other species, however, often change their mates annually, the Woodlark being one such example. Other arrangements exist, and co-operative breeding has been recorded in both Spike-heeled and Gray's Larks. There are reports of breeding Crested Larks consisting of trios of adults, and in Spain there are three observations of Lesser Short-toed Lark nests at which two males fed the brood; the possibility that the extra birds were helpers cannot be discarded. The fact that many larks nest semi-colonially, and that constant and obvious conflict between neighbouring males is evident, suggests that extra-pair paternity may occur extensively. Indeed, unpublished Spanish data on the results of DNA testing revealed that the sole chick in one Lesser Short-toed Lark nest was not the offspring of the male nest-owner, although it was the female's, and again, in a brood of three chicks of the Greater Short-toed Lark, the female was the mother of all but the male of the pair was the father of only two of them.

The well-known song flights of alaudids have already been discussed (see Voice). In many cases, the singing male hangs in the air or moves in circles or arcs, or simply drifts around in the air current. In others, however, such territorial advertisement is accompanied by more spectacular aerobatic displays, perhaps the best example of which is that of the Greater Hoopoe-lark. The male of this desert-dwelling species leaps skywards from the top of a shrub or a mound, rises some metres while emitting wonderful fluting sounds and, having attained the high point of its trajectory, spins around and plummets groundwards, bill first, with the wings tightly pressed to the body until the very instant of landing. This flight provides the opportunity, through wing-flapping and the spreading of the tail, for the bird to show off the striking plumage markings, namely the broad black and white bands on the wings, which recall those of its name-giver the Hoopoe (*Upupa epops*), and the white-bordered black tail. Many other lark species reveal display markings during their song flights; these are typically the otherwise hidden black-and-white wing and tail patterns, but in some cases those markings present elsewhere on the body, as with the sides of the neck of *Melanocorypha* larks, the head and neck of *Eremophila* and the underparts of *Eremopterix*.

Aggressive interactions between rival males are frequently observed. These confrontations take two distinct forms. In one, the contestants face up to each other on the ground, each holding the wings spread, the head and chest feathers erect and the body plumage fluffed up so as to make the individual appear larger than it really is. With some species, such as Dupont's Lark, they seize each other's bill and rotate the head violently in an attempt to twist the rival's neck. The second type of contest, which may also be interspecific, involves chasing an intruder or opponent in flight, as occurs among many other

passerines inhabiting open areas. Both types of behaviour are often observed during a single conflict.

The process of pair-bonding is often quite similar in nature to the male's antagonistic behaviour. Aerial chases are most frequent in the early stages of the reproductive cycle, at least in the case of the well-studied Greater Short-toed Lark, whereas interactions on the ground tend to occur once pairs have already formed. These terrestrial displays involve postures with the body held horizontal, the crest, breast and body feathers erected, the tail open and raised and the wings drooped, and movements including wing-quivering and the rapid dancing or running by the male in front of the female, as well as, sometimes, songs and calls. Copulation by Greater Short-toed Larks takes place on the ground, normally after a pursuit-flight.

Nest-construction is generally by the female alone, but the task is shared equally by both sexes of some species, including the Chestnut-backed Sparrow-lark, the Rufous-tailed and Desert Larks, the Malabar Lark (*Galerida malabarica*) and Sykes's Lark (*Galerida deva*). In other cases, the male may simply accompany the female as she gathers nesting material, although occasionally he may bring some contributions for the female to incorporate. The nest is nearly always on the ground, normally in the shelter of a small shrub, tuft of grass or rock. Many species of semi-arid regions, however, site their nests completely in the open and, in contrast, the Cape Clapper Lark and the Collared Lark sometimes build within a clump of grass. Only the Greater Hoopoe-lark builds its nests habitually off the ground in small bushes, although it, too, sometimes nests directly on the ground.

Nest-building begins with the excavation of a small depression in the soil. This is not unlike a roosting hollow (see General Habits) in appearance, but is distinguishable in that it does not contain accumulated faeces and it is somewhat deeper. The female builds a basal platform of small stones, pellets of soil or twigs, before assembling the wall and lining from carefully positioned grass stems. Quite a few Afrotropical larks construct a canopy over the nest, which they begin as soon as the hollow has been dug and which they later extend to include the rim of the nest, before completing the nest cup within. Domed nests of this kind are, in fact, characteristic of certain genera, so much so that they were once considered of relevance for purposes of taxonomy. Almost all *Mirafra* species build them, the sole exception being the Somali Long-billed Lark, the few located nests of which were undomed. Nest canopies are also typical of the genera *Heteromirafra* and *Calendulauda*, although, among the latter, the Pink-breasted Lark seems to be an exception. In *Pinarocorys* they have been noted for the Dusky Lark but not for the Rufous-rumped Lark, and in *Certhilauda* the nests of the Short-clawed Lark (*Certhilauda chuana*) are undomed and those of the Cape Long-billed Lark only occasionally have canopies. The nests of other lark genera are open, although individual birds may build canopies on rare occasions, as has been reported for the Woodlark.

Another intriguing feature of alaudid nests, although not exclusive to this family, is the extension of the nest platform to form an exterior "rampart" or "apron", which can be quite striking when, as with some species, it is built from pebbles. This external adornment may encircle the nest or, as is often the case, form a pathway at the entrance. Some species make the rampart from twigs, but the Black Lark uses the dung of livestock. Nests of the Black-eared Sparrow-lark and Stark's Lark are particularly showy, since the rampart comprises a rim of sand bound with spiders' webs, materials which are also used to a lesser extent by the Pink-billed Lark and the Spike-heeled Lark. The functions attributed to nest ramparts are diverse, and range from a possible protective role against windblown sand to an anti-predator role in camouflaging the site. Nests with ramparts are more widespread among species of arid or semi-arid zones: across the rainfall gradient which runs northwards from north Africa across Europe, all the typically desert species make pebble ramparts whereas, among the typically Mediterranean larks, they are seen at only a minority of the nests of the Thekla, Lesser Short-toed, Greater Short-toed and Dupont's Larks, all of which use sticks. Among the northern species, only the Horned Lark decorates the nest at times with small stones, a habit which is practised more rarely still by the Eurasian Skylark and the Woodlark. All of this suggests that ramparts may help to shelter nests from the highest temperatures reached on desert floors, which may exceed the tolerance of developing embryos or cause overheating of the brood. A comparison has been made of intact Desert Lark nests with others at which the ramparts had been removed experimentally,



Several Afrotropical larks build a modified nest with a domed roof. The nest of the ***Red Lark****, for example, is overarched by an interwoven mesh of fine grass stems. This type of canopy is usually constructed after the hollow has been made, but before the lining of the cup has been added. It conceals the nest contents and thus presumably minimizes predation. Interestingly, the entrance of domed nests is often orientated away from the sun's zenith, and the dome is sometimes absent in well-shaded sites. These facts, coupled with a lack of nest orientation in winter, suggest that shade is an important consideration for larks breeding in hot climates.*

[*Calendulauda burra*,
Kroon Farm, Brandvlei,
Bushmanland,
South Africa.
Photo: J. J. Brooks/
Photo Access]





In larks, as in most passerines, the importance of nest camouflage is paramount. Despite extreme differences in breeding habitat, an incubating ***Woodlark*** *is just as inconspicuous on an English heath as an incubating* ***Desert Lark*** *in the wilds of Jordan. The plumage of the former is dark and variegated, while that of the latter is pale and uniform. These features help larks and their nests blend into the background, and increase the likelihood that they will escape the attention of predators. The Desert Lark is among several members of the family noted to build "ramparts" around their nests. This feature, usually a raised rim of pebbles or sand bound with cobwebs, is just visible here. It is thought that ramparts are useful in three ways: they improve camouflage; defend nests against windblown sand and debris; and help to keep them cool. This Desert Lark has tucked her nest against a rock which might cast some shade early or late in the day. Any shade is valuable in the desert, as nest temperatures can exceed 50°C at midday, and adult larks are obliged to shield their eggs from the sun's glare simply to keep them cool.*

[Above: *Lullula arborea arborea*, Sussex, England. Photo: Dennis Green/ Oxford Scientific Films.

Below: *Ammomanes deserti isabellina*, Jordan. Photo: David Hosking/ FLPA]



In most larks, incubation begins with the laying of the last egg and ends 11-13 days later, or a little longer for the larger species. In general, incubation is the responsibility of females alone, although both adults share the task in at least one species of Mirafra *and most* Eremopterix. *This female* ***Thick-billed Lark*** *has positioned her nest beside a small shrub, which provides protection against the strength of the sun for part of the day. Her bold facial markings help to break up her outline and reduce the chances of detection by predators. In addition to a unique head-pattern, this North African lark has much the largest bill of any alaudid, and occupies a monotypic genus as a result.*

[*Ramphocoris clotbey*, Morocco.
Photo: Michel Gunther/Bios]

and the former were, indeed, found to be cooler than those without ramparts during the hottest hours of the day, perhaps because the stones heat up more slowly than the ground. The suggestion, made by Y. Orr, that the pebbles act as storage heaters which serve to incubate the eggs during the cool of the morning, allowing the incubating female to leave the nest and to forage for long periods at that time, is not supported by temperature measurements of the stones themselves. In any event, nest temperatures in the desert can approach 50°C during the hottest hours, which obliges the parents to cover eggs or young in order to shield them from the worst of the heat. Some species, such as the Grey-backed Sparrow-lark, when faced with substrates too hard for them to dig into, will build a large mound of stones, on which they can then form a cup.

Females differ in the quality of their nest structures. The differences have been found to be age-related in the case of the Dune Lark, in which undomed nests are built by females in their first year. Ramparts have been found to be more frequent in the early nests, holding first clutches, of the Thekla Lark, the Lesser Short-toed Lark, the Greater Short-toed Lark and the Iberian populations of the Eurasian Skylark, but are rarely present in replacement nests. It has been suggested that, in the Alaudidae, nest decorations may serve as an indicator of mate fitness. Such a role has been identified in the case of the Black Wheatear (*Oenanthe leucura*), the nests of which also incorporate a stone rampart; with this species, there is apparently a positive relationship between the number of pebbles used and the quality of the male that brings them, the nests with more pebbles enjoying higher reproductive success. Among alaudids, it is the female that builds the nest, but the explanation may be the same: the nest embellishments may indicate to the male the quality of his mate, ideally serving to reinforce the pair-bond and to maintain the male's fidelity. This is important, as the males have a key role in feeding and caring for the brood. A high-quality nest may also indicate the female's capacity to lay replacement clutches, an important consideration in view of the fact that so many lark nests are lost to predators.

The achieving of a favourable nest temperature is also a determinant of nest-siting. Most larks choose a site in the shadow of a shrub or rock, so that, especially in desert environments, the nests are sheltered from solar radiation and the worst of the heat. With the Sabota Lark, domed nests are less frequent among those constructed in the shade. In the case of Afrotropical species south of the equator, the nest entrance faces south, south-east or east, away from the sun when at its strongest. That of Mediterranean larks generally faces north or north-east, but in this region the timing of nesting is also influential; first clutches, laid early in the season when temperatures are more benign, are often in nests which are orientated at random or which have a slight tendency to face south, but second and replacement clutches, laid when temperatures are much higher, are almost invariably in nests which open northwards. In contrast, in cold environments, the Horned Lark sites its nests in such a way as to maximize their exposure to solar radiation. Finally, with regard to nest location, it has been demonstrated that the Lesser Short-toed Lark and the Thekla Lark prefer sites which offer good visibility in the vicinity of the nest, which would appear to be an anti-predator arrangement designed to maximize the likelihood of escaping from or distracting an approaching predator.

Clutch size is highly variable in the family, ranging from a single egg, as is always laid by Sclater's Lark, to up to 6 or 8 eggs in the Calandra and Black Larks. Clutch size appears to be relatively constant within certain genera. In *Mirafra*, *Heteromirafra* and *Calendulauda* it is 2-4 eggs, with an average of between 2·2 and 3·5, the exception being the Dune Lark, which nearly always lays two eggs; in *Pinarocorys* the normal clutch size is also two, whereas in *Ammomanopsis*, *Chersomanes*, *Certhilauda* and *Spizocorys* it is normally two or three. Clutch size is much more variable in the remaining genera. It seems to be clearly related to environmental aridity, even within species, being lower in drier zones. Thus, the Desert Lark lays 1-4 eggs in desert areas, but farther north the clutch is of 3-5 eggs; similarly, the Chestnut-backed Sparrow-lark normally lays two eggs, but in drier Senegambia it lays only one. In Montana, USA, a desert-living race of the Horned Lark has been found to have larger clutches in wetter years than in drier ones, and in some species such as the Grey-backed Sparrow-lark clutch size can increase in relation to rainfall even over just a few days. Alaudids do not seem to comply with "Lack's rule", which states that the clutch sizes of many birds tend to increase with higher latitude. In the



Rates of predation at lark nests are usually very high, often 80-90%, and breeding success consequently tends to be low. Heavy losses are inflicted by reptiles, such as snakes and lizards; birds, such as crows; and terrestrial mammals, for example, foxes, mongooses, weasels and hedgehogs. All of these eat eggs and nestlings, or even adult birds if given half a chance. In response to such pressures, this female ***Thekla Lark*** *has hidden her nest carefully in low vegetation and will not flush until almost stepped on, relying on her camouflage for protection. As might be expected, her eggs are also cryptically patterned with spots and blotches.*

[*Galerida theklae theklae*, Tudela, Navarre, Spain. Photo: José Antonio Martínez]

case of the Eurasian Skylark, at least, the mean clutch sizes of populations in Algeria/Tunisia, Spain and France are all very similar, at 3·76, 3·73 and 3·75 eggs, respectively; these figures are greater than the 3·35 in Switzerland and 3·64 in Britain, and not much smaller than those for Germany, the Netherlands and Estonia, where the respective means are 3·87, 3·92 and 3·97 eggs. In England, it has been noted that clutch sizes of this species are larger in the middle of the laying period than they are at either the beginning or the end of the season.

The number of clutches laid in a season is not known for most members of the family. Among those studied, however, the Chestnut-backed Sparrow-lark, the Desert Lark, the Bimaculated, Calandra and White-winged Larks, the Greater Short-toed and Lesser Short-toed Larks, the Horned Lark and the Woodlark are all normally or often double-brooded, while some species, such as the Greater Hoopoe-lark, are usually single-brooded. Others, including the Crested and Thekla Larks, may raise between two and four broods in a single breeding season, as also does the Eurasian Skylark, which can, on rare occasions, rear as many as five. The Dune Lark, too, although normally regarded as being double-brooded, may raise between one and four, and a similar pattern appears in the Short-clawed Lark. The proportion of females laying different numbers of clutches remains largely unknown, but in the case of the Calandra Lark only 30% of females lay second clutches.

Alaudid eggs are very cryptically patterned, as would be expected for ground-nesting birds. The clutch is laid at the rate of one egg per day. Nest parasitism has been observed among larks, albeit affecting fewer than 1% of nests. Such behaviour has been recorded both within species, as illustrated by the Crested Lark and the Thekla Lark, and between species. Interspecific nest parasitism can involve congeners, as with the Lesser Short-toed Lark parasitizing the Greater Short-toed Lark, or members of different genera, as exemplified by the Lesser Short-toed Lark parasitizing Temminck's Lark, or the Crested Lark laying in the nest of the Sand Lark (*Calandrella raytal*); moreover, it has been noted that parasite young tend to fledge sooner than do those of the legitimate brood. Nevertheless, in contrast to the situation that occurs among ducks, it does not appear that any individual larks specialize in egg-dumping behaviour. It seems most probable that, instead, nest parasitism results from opportunistic laying by females which have lost their own nests to predators during the egg-laying stage, and which find themselves obliged to dispose of eggs which they were about to lay. This circumstance is supported by the fact that abandoned eggs are rather frequently found in small depressions in the soil, these perhaps belonging to females which have lost their own nests and have been unable to find another in which to lay.

For most of the species sufficiently studied, incubation is undertaken by the female alone, although there are exceptions. There is a general lack of relevant information for the genus *Mirafra*, but in the case of the Australasian Bushlark, at least, incubation involves both sexes, as commonly occurs among *Eremopterix* sparrow-larks, and perhaps also occurs with some species of *Galerida*, such as the Malabar Lark and Sykes's Lark, and with one of *Alauda*, the Oriental Skylark. In some species, including the Pink-billed Lark and the Black-crowned Sparrow-lark, incubation begins with the first egg, but in the great majority it starts only when the clutch is complete or, as with the Thekla Lark, when the penultimate egg has been laid. The incubation period is short, lasting 11-13 days in most species, though up to 14 days in the Greater Hoopoe-lark and 15-16 days in the Black Lark. Some sparrow-larks breeding opportunistically in arid areas have extremely short incubation, averaging 9·6-10·2 days, with some records of merely eight days; these are among the shortest incubation periods of any bird.

Nestlings of all lark species are cared for by both parents, which feed them and remove faecal sacs, although it is normally the female that broods the chicks or shades them from the sun when they are between one and four days old. The chicks have a sparse covering of down on the dorsal surface, which is effective in camouflaging them. They grow very rapidly, at or near the fastest rate that is physiologically possible. In nearly all instances, the young are capable of leaving the nest once they are seven or eight days old, although, if undisturbed, they sometimes remain there for up to 12-14 days. Once fledged, the youngsters hide in the vicinity of the nest and continue to be fed by the parents. The post-fledging period of care is relatively long: in all members of the family for which this aspect has been studied, the young take nearly a month to become independent of their parents.



In the first few days after hatching, it is usually the female that broods the chicks at night or shades them from the sun during the day. The chicks themselves have a sparse covering of down on their upperparts, presumably to insulate them from the cold, and to provide camouflage. Despite being several days old, these ***Eurasian Skylark*** *nestlings still wear conspicuous tufts of down on their crowns. As this photograph implies, the skylark is a species of grassy meadows. Given the shortage of natural meadows in Western Europe, many nests are situated in the next best thing: crop fields. Of course, the breeding season is thus truncated by the harvest, and many nests are destroyed at harvest time. In this way, agricultural intensification, in conjunction with shifts in sowing and cropping strategies, underlies the massive decline in skylark populations across Europe. Recent research has shown that breeding success is greatly increased when farmers leave small strips of natural grass and hedgerow between their crops. Skylarks prefer to breed in these strips, and thus far fewer nests are destroyed. This practical approach to lark conservation is promoted by agencies in Britain, even leading to the launch of "skylark-friendly" bread.*

[*Alauda arvensis arvensis*, Rednal airfield, Shropshire, England. Photo: John Hawkins/ FLPA]



*The **Thekla Lark** is relatively common in parts of southern Europe. Here, intensive studies have shed some light on its breeding cycle. The incubation period begins with either the last or the penultimate egg (there being 3-5 eggs in total) and continues for 12 days, after which the chicks hatch. The brood is then raised by both parents, which usually manage to produce two, or even three, broods per season. The species is socially monogamous, in common with most larks. Individuals usually retain their partners for successive clutches, but occasional extra-pair copulation has been recorded.*

[*Galerida theklae theklae*, La Rioja, Spain. Photo: José Luis Gómez de Francisco]

Mortality in the nest tends to be high, and is a factor of great importance in lark population dynamics. Among species living in the least transformed habitats, be they Afrotropical, north African or Mediterranean, as many as 80-90% of nests are lost; those larks inhabiting man-modified environments, such as the Calandra Lark, the Crested Lark and the Eurasian Skylark, normally lose 30-50%. The rates of nest loss also seem to be related to aridity, being greater in drier habitats; the pattern is unclear, however, given that, in Iberia, both Mediterranean and Eurosiberian lark species suffer very high losses. Most nest losses are due to predators, predominantly generalists such as foxes (Canidae) and crows (Corvidae), but mongooses (Herpestidae), weasels (*Mustela*), hedgehogs (Erinaceidae), snakes and large lizards, among others, are also implicated. In arid areas of southern Africa, nest flooding can be a significant cause of failure, for example in the Grey-backed Sparrow-lark and Stark's Lark. Partial losses, involving starvation of some members of a brood, are uncommon.

Inevitably, larks are relatively well adapted to cope with such high losses of eggs and broods. On the one hand, they are capable of laying replacement clutches quite rapidly; a lost nest may be replaced after barely 2-4 days, with re-laying beginning 4-6 days after the initial predation event. In addition, the rapid growth rate of the chicks allows females to begin a second clutch before the first brood fledges, leaving the males to care for the young, a duty in which nest helpers have been found to play a role in the cases of the Short-clawed and Spike-heeled Larks, at least. It has also been suggested that clutch size is adjusted to the likelihood of loss, the high levels of predation favouring smaller clutches; these represent a smaller investment, are exposed to predation for a shorter time during the egg-laying phase, and can be replaced more quickly if necessary. Such a strategy seems to be exemplified by Sclater's Lark, the single-egg clutch of which may be a response to the attentions of mongooses and African polecats (*Ictonyx*). Another anti-predator adaptation shown by this desert species is the siting of the nest in the middle of bare expanses of quartz gravel, despite the heat which it must endure there, instead of in places with shrubs or grasses which, although providing shade and camouflage, are more frequented by predators. Finally, alaudids, in common with many other birds, resort to distraction displays in an attempt to lure predators away from nests. In such situations, they make themselves conspicuous and draw attention to themselves with loud calls, sometimes also performing mock attacks on any intruders. As may be expected, the frequency and intensity of such behaviour increase with the age of the eggs or chicks and, hence, with the parental investment which it represents.

Perhaps also as a consequence of the high mortality at the nest stage, the few available data on the population dynamics of larks suggest that these are long-lived birds, relatively more so than are other passerines of similar sizes. Longevity of up to ten years has been recorded for the Eurasian Skylark in England, where five-year-old birds are frequently encountered, with a mean annual mortality of some 33%. In the USA, a Horned Lark which had been ringed as an adult was recovered seven years later, by which time it must have been at least eight years old. The Dune Lark in the Namib Desert may reach six years of age, and a breeding Lesser Short-toed Lark in Spain was at least five years old.

Sex ratios in the Alaudidae appear to exhibit some interesting features, notwithstanding the fact that they have been little studied. Among Crested Larks in Turkmenistan, for instance, males greatly outnumber females and, moreover, the proportion increases in favour of males during the course of the annual cycle: the ratio of males to females at fledging is 1·9, rising to 2·7 in spring and up to 4·3 in winter. This implies greater mortality among females, perhaps because the males of this species, as those of most larks, do not take part in incubation, when females are especially vulnerable to predation. A similarly skewed sex ratio has been found for the Black Lark; in one study, over two-thirds of fledglings were males. The numerical inequality between the sexes may have added to the selective pressures leading to the evolution of the dramatic aerial displays of male larks (see also Voice).

Movements

Larks exhibit a great diversity of movements, including regular and partial migration, vagrancy and nomadism. Many species, however, are entirely sedentary. Among others, it is often the case that some populations of a single species undertake one kind of movement, while others either perform another type or are sedentary. There are links between the types of movement undertaken and the degree of sociability of a given species, as well as

the nature of its diet. The nomadic larks of the southern African deserts are gregarious seed-eaters, whereas the sedentary species in the same region tend to be solitary and more insectivorous. The same seems to apply among the larks of north Africa. According to statements in the literature, of the ten species which habitually spend the winter months within the north African desert, the two having a bill shape indicative of a predominantly insectivorous diet, Dupont's Lark and the Greater Hoopoe-lark, are sedentary. In contrast, of the three species which have a seed-eater's bill, the Lesser Short-toed and Thick-billed Larks are more or less nomadic and the Calandra Lark undertakes movements of unknown extent.

Most larks are, in fact, residents. This is especially true of the Afrotropical species, 90% of which can be so described. Nevertheless, in general, only around 20% of the world's lark species may be considered to be strictly sedentary. Among the remainder, nomadic or wandering larks are more numerous in Africa and alaudids with migratory populations are more frequent in Eurasia. This situation is obviously related to patterns of food availability, which are more predictable on a seasonal basis on the steppes and in other Eurasian habitats than they are in the arid and semi-arid regions of Africa.

There are few members of the family in which all or most of the populations are migratory. Among the Eurasian species, this applies solely to the Bimaculated, White-winged, Greater Short-toed and Hume's Larks, and even here the southern populations of the last two species may be only partially migratory. The Bimaculated, Greater Short-toed and Hume's Larks travel great distances. The first of these three breeds from Asia Minor and the Near East eastwards to Central Asia, after which it migrates mainly to Pakistan and north-western India, although some of its populations undertake shorter journeys to winter in the Middle East and others reach north-eastern Africa. The Greater Short-toed Lark breeds from the Maghreb and Iberia eastwards to Iran and Central Asia and winters mostly in Africa, south of the Sahel and the Red Sea, between latitudes 17° and 14° N. Finally, Hume's Lark breeds in Asia, from eastern Iran across to central China, and spends the winter months primarily in the north and centre of the Indian Subcontinent, although some of its populations apparently perform only short-distance altitudinal movements. Among Afrotropical alaudids, only the Dusky Lark is known to be entirely migratory, breeding in Central Africa during the dry season, from July to October, and then moving mainly south and east; in South Africa, it is recorded mainly between December and April. The movements of many Afrotropical species, however, are still poorly known.

The tendency for different populations of a species to exhibit different kinds of movement is most marked in widely distributed northern species. This is well illustrated by the Horned Lark, the northernmost populations of which, in both Eurasia and North America, are completely migratory, whereas those farther south are resident or do no more than undertake altitudinal movements or short-distance dispersal. Even among species with a more southerly distribution, such as the Crested, Lesser Short-toed and Calandra Larks, it is noticeable that the north African populations are sedentary or, at best, wander, whereas those breeding farther north, in Russia, are total or partial migrants which travel long distances.

For some alaudids, the types of migratory behaviour have been noted to differ according to sex and age-class. In central Europe, the passage of female Eurasian Skylarks occurs about a week earlier than that of the males, and it appears that, on average, the females travel farther. In contrast, the males return to the breeding grounds in spring ahead of the females, as also occurs among Horned Larks in North America. Young Black Larks disperse farther in winter than do adults.

Migratory movements undertaken by alaudids are often on a broad front, but concentrations can occur at mountain passes or along coastlines. Eurasian Skylarks move largely by day, especially during the first few hours after sunrise, although their calls have been heard as the birds make landfall from sea crossings at night. Horned Larks seem to be entirely diurnal migrants, and this idea is supported by the fact that there are no records of this species flying into such obstacles as masts and lighthouses during the night. They travel in flocks, which often stop to feed.

Relationship with Man

Few passerines are more familiar to people than are larks. This is somewhat surprising in view of the fact that the family Alaudidae contains only a moderate number of species, of sober plumage,



As far as is known, nestlings of all lark species are attended by both their parents, with males and females investing roughly the same amount of effort provisioning their offspring. Sharing of parental duties in members of the genus Eremopterix, *such as the* ***Black-eared Sparrow-lark****, is especially egalitarian as males also carry out about half of the incubation. This species is endemic to the Kalahari and Karoo regions of southern Africa, where it is nomadic. As in several other lark species with erratic breeding ranges, pairs tend to nest in clumped aggregations, sometimes only 20 m apart, wherever suitable conditions prevail.*

[*Eremopterix australis*, near Brandvlei, Bushmanland, Northern Cape, South Africa. Photo: Peter Steyn/ Photo Access]

and inhabiting chiefly parts of Africa and Asia that are sparsely populated by humans. The explanation for this must be sought among a handful of species which, probably since Neolithic times, have accompanied the development of human agriculture. Such species, which include the Eurasian Skylark, the Calandra Lark and the Crested Lark, are closely tied to cultivation, as is suggested by the scientific name of the Eurasian Skylark; *Alauda arvensis* means "lark of the fields". It is in cultivated fields, especially in crops of wheat and other cereals, that they attain high densities, and here they lay claim to the auditory landscape with their incessant songs, delivered on the wing. Their impact on western culture is well known and of long standing, as testified by their ancient Greek names, such as *corytalos* and *calandros*, or Latin ones, such as *galerita* and *alauda*. This last name was adopted by Linnaeus for the single genus in which he placed all the lark species known to him, and it is now the type genus of the family Alaudidae.

Pliny the Elder, the renowned Roman scholar and natural historian, relates that the sonorous name "*alauda*" came to the Romans from the Gauls. Apparently, one of the legions which took part in the Gallic wars came to be so named, according to some, because its members wore their insignia on the peak of the helmet, recalling the crest of a lark, although others claimed that the name was due to the soldiers' constant ebullience, especially at dawn, when they sang their war songs. From *alauda* are derived, among other names, the French *alouette*, the Italian *allodola*, the Catalan *alosa* and the Spanish *aloya* and *alondra*. In contrast, a Germanic root is responsible for the German *lerche*, the Swedish *lärka*, the Icelandic *lævirki*, the Dutch *leeuwerik*, the Galician-Portuguese *laverca*, the Scottish *laverock* and, evidently, the English "lark".

Early written observations of larks date back at least to Aristotle, who commented on some interesting aspects of the lives of these birds, namely that they dust-bathe like chickens and that cuckoos (*Cuculus*) lay in their nests, although, curiously, he does not seem to remark upon their song flights. In order to find an account which first does such behaviour justice, it is necessary to advance to the thirteenth century, to the writings of Albertus Magnus: "*avis est a laude vocata, eo quod musica sereno et calido congaudet tempore... mas ejus musicus est valde et multae modulationis, aestaten primo inter aves praenuntians et diem in aurora promens laude cantus sui*". This passage may be translated as follows: The bird's name derives from *laude*, meaning praise, for its music gives great pleasure in the seasons of peace and warmth... The highly modulated music announces, first among birds, the summer and signals the first light of day with the praising of its song.

From this time onwards, references to the voices of larks become the most frequent allusions to birdsong throughout western literature, with only the nightingale (*Luscinia*) to rival them. References to both of these birds are often made at the same time, the nightingale being cast as king of the night and the lark as "herald of the morn", to quote William Shakespeare. There is the well-known scene in the play *Romeo and Juliet* in which, after the two leading characters' first night of love, the song of a bird startles Romeo, who takes it to be the first lark of the day, whereas Juliet, trying to delay her lover's departure, reassures him that it is but a tardy nightingale. Allusions to larks are legion in English poetry, from Chaucer's "bisy lark, messager of daye" to Shelley's "blithe spirit", and through the works of Tennyson, Gray, Hood, Walton and so many others, all of them marvelling upon this little dun bird which loses itself upon the heights to "pour upon the world a flood of harmony", as wrote William Wordsworth. It is rather odd that, in the Spanish literature, it is the *calandria*, the Calandra Lark, that is initially prominent, appearing in the oldest poetic works, such as *Los Milagros de Nuestra Señora*, by the thirteenth-century poet Gonzalo de Berceo, and the fourteenth-century work *Libro de Buen Amor*, by Arcipreste de Hita, not forgetting that beautiful romance, by an unknown hand, in which a captive, languishing in the darkness of his prison cell, roundly curses the crossbowman who has killed the small bird which told him when it was day. Later, the *alondras* take over from the *calandrias* in Spanish literature, receiving in their turn abundant attention from poets, from Juan Meléndez Valdés to Antonio Machado and Gerardo Diego. By way of paying brief homage to other European literature, it is relevant to close this section by quoting from the immortal verses of Goethe's *Faustus*:

"Es ist wohl jedem eingeboren,
daß sein Gefühl hinauf und vorwärts dringt,
wenn über ihm, im blauen Raum verloren,
ihr schemetternd Lied die Lerche singt".



*This **Calandra Lark** has just fed one of its chicks a large invertebrate. Indeed, invertebrates make up the bulk of food intake in nestlings of all but the most granivorous of larks. At least in temperate regions, adults also themselves consume many insects during the breeding season. This seasonal dietary preference seems to be related to energy content, water content, and the requirement of chicks for non-plant matter to supply the proteins necessary for growth; of course, it is also relevant that invertebrates are less readily available in the colder months.*

[*Melanocorypha calandra calandra*, La Rioja, Spain. Photo: José Luis Gómez de Francisco]



Nestling larks grow very rapidly, almost as fast as is physiologically possible. After only 7-8 days the legs of this juvenile ***Red-capped Lark*** *are sufficiently well developed for it to vacate the nest. It will be another week before this particular lark can fly, but adults prefer to scatter the brood as soon as possible, and thus minimize the likelihood of all their offspring being predated together. Juveniles remain dependent for roughly a month before leaving the natal territory altogether. When lark broods are threatened, both adults may perform a distraction display wherein they flutter, feign injury, or wing-clap near the ground.*

[*Calandrella cinerea cinerea*,
near Brandvlei,
Bushmanland,
Northern Cape,
South Africa.
Photo: Nico Myburgh]

[Innate to all, 'tis surely true,
that the heart, uplifted, onward soars
when up aloft, lost in the blue,
its ringing song the lark outpours]

The poetic and musical inspiration lent by larks to humanity has not saved them from persistent persecution, for very material reasons. Sometimes, the desire has been to imprison them as cagebirds, for their songs, as has often been the fate of the Calandra Lark in Mediterranean countries, but often they have simply been eaten. In the words of the popular French song, *Alouette, gentille alouette, alouette, je te plumerai*, a translation of which would run "lark, sweet lark, I shall pluck you". Eurasian Skylarks, in particular, have suffered much hunting in Europe, this being due to their former abundance and to their gregariousness on passage and in winter. Greek vases from the sixth century BC depict scenes of lark-hunting, and such birds were the typical target in the Middle Ages for falconers flying the Merlin, referred to as the ladies' hawk in some countries, or the Eurasian Hobby (*Falco subbuteo*). Larks have been taken with nooses, traps and a variety of nets, as well as with shotguns, often after being attracted by imitations of their calls with whistles and, latterly, recordings, or by using tethered owls (Strigidae). A further method of attracting larks is the use of what are termed "lark mirrors", rotatable devices covered with multiple strips of mirror which reflect the sun. These have been widely employed in many parts of Europe, hence the French term *miroir*, the Spanish *espejuelo* and the German *Lerchenspiegel*, among others. The attractiveness of these mirrors to larks has been much debated, but the reason for it remains unknown; there are those who consider that the reflections may be mistaken for a water spring or a puddle, but, as already noted (see General Habits), larks hardly ever visit drinking places and they appear not to bathe in water. Another traditional hunting technique is nocturnal, and involves the using of a spotlight in order to dazzle the birds at their winter roosts; the hunter uses a cow bell so as to fool the birds into believing that he is a cow.

It is clear that larks, however obtained, were in the past consumed in prodigious quantities in Europe. Early in the nineteenth century, in northern Germany, tax receipts at Leipzig market alone indicate that over 5,000,000 larks were sold annually. Meanwhile, London markets received some 400,000 larks in 1854, and at Dieppe, on the other side of the English Channel, the official records for the 1867/68 winter refer to a total of 255,500 birds as having been handled. Lark-hunting was especially intensive in northern Germany, Denmark, the Netherlands and Belgium. Even today, and despite the official protection afforded to larks by European Community legislation, hunting "traditions" are still tolerated in countries farther south, as in Italy and France. It has been estimated that, in 1997, some 1·5 million larks were captured in each of these two countries. In France, where the *pâté d'alouette*, lark pâté, is regarded as an extraordinary delicacy, larks are caught in the south-west in October and November, the hunters taking advantage of the passage of migrants heading for winter quarters in Iberia and the Maghreb region of north-west Africa. Here, in the French departments of Gironde, Landes, Loir-et-Garonne and Pyrénées Atlantiques, they are caught mainly with special nets known as *pantes*.

The seed-eating habit of the Eurasian Skylark, and the losses which this species was supposed to inflict on agriculture, once provided a justification for hunting it, although this specific excuse proved invalid once the birds' diet was investigated scientifically. In fact, the species is likely to do more harm by eating the green parts of crops than by consuming seed. A study in English sugar-beet fields in spring revealed that cotyledons and the first true leaves of the plants made up 62% of the larks' diet there. The same species in Iraq, in winter, has been found to nibble the young leaves of wheat and barley, which may reduce yields a little, and it also causes severe damage in pastures enriched with lucerne (*Medicago*), resulting in losses of the order of 50% both to plant cover and to seed production. In Israel, too, the Eurasian Skylark is officially considered a pest, being accused of causing damage to fields of sprouting lucerne and wheat and also in plant nurseries.

Despite this, larks generally are not great consumers of grain. This is in part because most of them, unlike such birds as sparrows, weavers, queleas (*Quelea*) and New World blackbirds, do not perch on the plant stems. Instead, they content themselves with fallen seed, taken after the harvest, although flocks of Greater Short-toed Larks in Rajasthan, in western India, have been seen to hover over a field of pearl millet in order to peck the panicles and make the grain fall. The literature on the Alaudidae reports

really serious problems only from Sudan, where, around the 1970s, the Bimaculated Lark was causing severe damage to irrigated sorghum plantations in the semi-desert area of El Butana, near Khartoum. The larks, which are only winter visitors there, gathered in flocks of up to 200 and consumed unripe, milky seeds, which they ripped out of the seedheads, as well as mature grain, which they reached by perching on the plants. The problem was tackled with the use of the avicide fenthion, applied mainly by aerial spraying, which reduced the original estimated population of 200,000 birds by barely 10%. Also in Sudan, the species has been accused of digging up recently planted seed, but, bearing in mind that sorghum is planted in June, whereas the larks do not arrive until October, when the plants are well grown, this charge would not seem to be sustainable.

Status and Conservation

Alaudids provide examples of practically the full range of avian population sizes. Some number many millions of pairs, while others can muster only a few hundred, the differences generally reflecting the very variable extents of their geographical distributions. At one extreme there is the Horned Lark, of Holarctic distribution and arguably one of the world's most abundant passerines. At the other there are several highly localized African species, the future propects of which must give serious cause for concern. Many lark populations are closely affected by human agricultural and pastoral activity, as a result of the modifications which these have imposed upon their habitats.

Lark population densities tend to be relatively low, primarily because of the low productivity which is typical of the open and more or less arid habitats which they generally occupy. Those inhabiting the more productive mesic regions attain higher densities. For example, the Eurasian Skylark in England occurs at between 0·1 and 0·5 pairs per hectare on arable farmland and reaches up to 0·7 pairs per hectare on coastal sand dunes. Similarly, favourable habitats in Spain yield, again on a hectare basis, up to two or three individuals in the case of the Calandra Lark and the Lesser Short-toed Lark, and up to four or five Greater Short-toed Larks. In contrast, desert-dwelling species are often very thinly spread, and it is sometimes necessary to drive many kilometres just to find a few birds. Nevertheless, the nomadic and gregarious desert species can form considerable concentrations in confined areas, where some sparrow-larks, for example, occur at up to 12·5 pairs per hectare. In any event, larks tend to be among the most abundant members of steppe and desert avian communities, often very noticeably so. It is also the case that, although they may occur at low density, the immense geographical expanses occupied by their favoured habitats of tundra, steppe, savanna, desert and arable land result in many alaudids having large or very large total populations.

BirdLife International's *Threatened Birds of the World*, published in 2000, classifies only eight lark species as globally threatened. Since the Alaudidae numbers nearly 100 species, this implies a relatively favourable situation for the family as a whole, given that some 13% of all the world's bird species are considered to be under threat. Furthermore, no larks are known to have become extinct in recent centuries. The eight threatened alaudids are all Afrotropical taxa, and all of them occupy very small, perhaps relict, geographical ranges. Four are from the north-eastern arid zone; these are Ash's Lark (*Mirafra ashi*), the Degodi Lark, Archer's Lark and the Sidamo Lark. A further three, Rudd's Lark, Botha's Lark (*Spizocorys fringillaris*) and the Red Lark, are restricted to the extreme south of the region. The eighth species, the Raso Lark, occupies another "corner of Africa", the volcanic Cape Verde Islands, situated in the eastern Atlantic Ocean 460-830 km west of Senegal; it is a strange lark, formerly placed in the genus *Spizocorys* but now included in *Alauda*. It is very odd that all three species in the very interesting genus *Heteromirafra*, the Archer's, Sidamo and Rudd's Larks, should be among those considered to be at risk. With regard to categories of threat, two species, Rudd's Lark and the Raso Lark, are listed as Critical; two more, Ash's Lark and Botha's Lark, are Endangered; and the remaining four are classed as Vulnerable.

According to BirdLife International, habitat loss or degradation is the principal threat to seven of the eight globally threatened lark species. The exception is the Raso Lark of the Cape Verdes, which occupies an uninhabited islet, of scarcely 7 km² in extent, which is variously named Raza, Razo or Raso. Its total population is very small and fluctuates considerably from year to year, in response, apparently, to the highly variable amount of rainfall. It may number barely 40 birds in drought years, but may rise to 250 in others. In the last reported census, in 2002, be-



*The **Degodi Lark** is restricted to an area of south Ethiopia classified as the Jubba and Shabeelle Valleys EBA. It is thought to number less than 1000 individuals, but this is based on an almost complete lack of evidence. It is very poorly known and no surveys have been undertaken, partly because of security issues within its range. It is one of several larks for which the difficulty of surveying and protecting land in north-east Africa is a chronic problem. Decades of famine, civil war and banditry have severely handicapped conservation action, and in this uncertain situation the Degodi Lark undeniably deserves its rating as Vulnerable.*

[*Mirafra degodiensis*, Bogol Manya, Ethiopia. Photo: Göran Alstedt/ Windrush]



Oddly enough, all three members of the genus Heteromirafra *are threatened with extinction. In view of the disjunction in their ranges, it seems likely that they may be survivors of an ancient lark lineage. One of them, the* ***Sidamo Lark****, is known from only two sites in the South Ethiopian Highlands EBA, and is classed as Vulnerable. The only global estimate of numbers available, 2500-10,000 individuals, is arrived at largely on the basis of inference, and intensive field research is needed. One factor to be kept in mind is that, like other members of the genus, it is difficult to find when males are not calling.*

[*Heteromirafra sidamoensis*, Negele, Ethiopia. Photo: Göran Ekström]

tween 128 and 138 individuals were recorded, of which 61% were males. This uneven sex ratio is possibly related to the sexual dimorphism in bill structure, the bill being longer in males than in females, and to the consequent differences between the sexes in feeding and in the ability to exploit the food available at the time (see Morphological Aspects), although it is worth recalling that imbalances in sex ratios seem to be frequent among larks (see Breeding). The islet is a nature reserve, at least on paper, but it is feared that the fishermen who visit to collect seabird eggs may accidentally introduce such predators as rats (*Rattus*), cats or dogs, which could prove fatal to such a small population. As it is, a near-endemic gecko of the genus *Tarentola* has recently been identified as possibly a serious raider of nests.

Rudd's Lark, the other Critically Endangered alaudid, is patchily distributed in the highland grasslands of South Africa, where its total range covers probably less than 500 km^2. Its habitat, of moderately to heavily grazed humid pastures, receiving over 600 mm of rain annually and situated at altitudes of 1600-1800 m, is under threat of conversion to arable land. The establishment of a Grassland Biosphere Reserve around Wakkerstroom and Volksrust is proposed, and this could afford protection to about 85% of the species' population. The reserve would, in addition, protect important numbers of Botha's Lark, also a species of high pastures and one which is threatened both by agriculture and by afforestation. The third threatened South African species, the Red Lark, occupies a very different habitat, the red sand dunes of the northern Cape Province. The principal problem there is domestic livestock, especially sheep, which damage the fragile dune vegetation by overgrazing and trampling.

In addition to the eight globally threatened lark species, three others are categorized as Near-threatened. All three are confined to the southern parts of Africa. The Melodious Lark has a fragmented range in South Africa, with smaller populations in Zimbabwe and Botswana. Much of its grassland habitat has already been lost to farming and development, and in some parts of its range the remaining areas are heavily grazed. The Agulhas Long-billed Lark is found only in South Africa, where its apparently small total population is restricted to the western Cape. Much of the region in which it occurs has been converted to wheat fields and pasture. Although the lark seems to be fairly well adapted to these unnatural habitats, and may even have benefited from the conversion of the original land, it remains patchily distributed within its range, for reasons unknown. Very little is known about this species' ecology and any potential threats which it may face.

The last of the three Near-threatened species, Sclater's Lark, inhabits arid and semi-arid stony and gravelly plains with scattered grasses and shrubs in the Northern Cape and southern Namibia. Again, it has a highly fragmented range and is generally uncommon and local. In some areas it shows a strong preference for specific sites, where it breeds every year. At the edge of its range, however, its appearance is far less predictable and it seems to lead a nomadic existence, moving in response to rainfall patterns. There is, as yet, no evidence that the populations of Sclater's Lark have declined, but it is thought that increased grazing pressure could have a serious impact on this lark's numbers.

Lack of information is a fundamental problem affecting the protection of threatened African larks, especially those of the north-east, where the dangers posed by the semi-permanent states of war in recent decades must be added to the habitual problems of difficulty of access. Extremely little is known about the one Endangered and three Vulnerable species of this region with regard to their current distributions, their numbers and population trends, their ecology and their conservation problems. The secretive Archer's Lark was discovered in 1922, in Somalia, but it has been seen only once since then, in 1955, nearly half a century ago. The other three were first collected relatively recently, Ash's Lark in 1981, also in Somalia, and the Sidamo Lark and the Degodi Lark both in Ethiopia in, respectively, 1968 and 1971. Many years passed before these three alaudids were again observed in the field, and such sightings have been very few and confined to the type localities or their immediate vicinities.

Absence of information is also reflected in the conservation category of Data-deficient, in which three more African larks are placed. One of these, the Obbia Lark (*Spizocorys obbiensis*), is found only on vegetated sand dunes along the central coastal strip of eastern Somalia, whereas Williams's Lark (*Mirafra williamsi*) is confined to north and central Kenya and Friedmann's Lark has a highly fragmented distribution in East Africa, from south Ethiopia southwards to north Tanzania. The Obbia Lark was reportedly abundant within its small range, but lack of recent surveys hampers any true assessment of its current status. Its apparent reliance on one particular habitat type, of limited extent, would presumably render it vulnerable to any loss or severe degradation of the dune biotope. Williams's Lark lives in rocky desert plains with short grass and low shrubs in the north of its range, but inhabits stands of low *Barleria* shrubs growing on rocky lava desert in central Kenya. It was first discovered in 1955, and in the half-century since then little has been documented with re-

gard to its breeding biology, ecology, distribution and population size. The widely scattered populations of Friedmann's Lark seem to prefer denser grassland with bushes, possibly shunning drier areas, but this is a very poorly known species. It appears certainly to be rare, with very few documented records, most of these from Tsavo National Park, in south-east Kenya, and the adjacent Mkomazi Game Reserve, in north-east Tanzania.

A better taxonomic understanding of larks, especially African ones, may reveal as yet undiscovered "hidden" species requiring attention from conservationists. This may well apply to Beesley's Lark (*Chersomanes beesleyi*) of northern Tanzania, which K. Barnes and N. and L. Baker have recently identified as a new species, genetically distinct from the slightly larger Spike-heeled Lark, with which it had been considered conspecific. Beesley's Lark is found nearly 2000 km to the north of the nearest populations of the latter, and would appear to number barely 100-300 individuals, all confined to two small areas of grassland, subject to heavy grazing and trampling by cattle, in the rainshadows of Mount Kilimanjaro and Mount Meru. Assuming that the taxonomic status of Beesley's Lark is confirmed, this alaudid, instead of representing an interesting disjunct population of a relatively common species, becomes a new Tanzanian endemic and probably the one which is most in need of attention. It is likely to merit the conservation status of Endangered, or even Critical. There is clearly an urgent requirement for both taxonomic and field studies in order to clarify the status of this and other larks.

Some subspecies of alaudids are in serious difficulty. One of these is the nominate race of the Lesser Short-toed Lark, restricted to Tenerife, in the Canary Islands, where it has been driven to the brink of extinction by loss of habitat and by introduced predators. Only two breeding pairs survived in 2002, both within the precincts of Los Rodeos international airport, in the north of the island, in addition to a few captive individuals with which, as a final resort, it is intended to establish a captive-breeding programme. The importance of such a programme is highlighted by the fact that, in 2003, none remained in the Los Rodeos area, although in the south there was still a very small population, numbering fewer than 15 pairs; some doubts had been expressed as to whether these belonged to the nominate race, but a recent genetic study has shown no difference from the latter. Similarly, the endemic Hungarian race *hungarica* of the Greater Short-toed Lark seems to be highly endangered, as the known population within its isolated range numbers only some ten pairs. These are apparently boosted by periodical influxes, a fact which casts serious doubts on the validity of the taxon.

Very few measures are in place to protect threatened larks, and such conservation initiatives often encounter serious difficulties. The siting of potential reserves in arid zones is problematic. In the Karoo, South Africa, protection from overgrazing is regarded as of vital importance, as livestock damages the vegetation to the extent that sheltered nest-sites are eliminated and arthropod abundance is reduced, so much so that the larks' breeding success can fall to zero. Nevertheless, protecting specific sites is ineffective, because these larks are generally nomadic, dependent on habitat patches which flourish briefly after rains and are consequently erratic in both space and time. Relationships between alaudids and livestock may be very different elsewhere, as has been found in Arizona, USA, where a comparison between two similar *mesas* (steep-sided, flat-topped hills), one a livestock ranch and the other ungrazed for many years, revealed that Horned Lark densities were nearly five times higher in the former than in the latter; in other words, grazing had a highly beneficial impact on the larks. A clear relationship between lark populations and vegetation structure has been identified on other occasions, and there is no doubt that the protection of certain species demands a better understanding of the response of vegetation to different grazing pressures. In north Germany, for example, overgrazing by sheep in an area of saltmarsh in Schleswig-Holstein was responsible for a 93% decline in the local population of the Eurasian Skylark over a period of just 13 years.

Moreover, the effects of predation on reproductive success need to be understood. A good example is provided by the situation in the reserve of Las Amoladeras, in the Spanish province of Almería, which was established in order to protect Dupont's Lark, the Thekla Lark and the Lesser Short-toed Lark, among other species. The strict protection regime led to a spectacular growth in the population of rabbits (*Oryctolagus cuniculus*), and these, in turn, attracted numerous foxes (*Vulpes vulpes*) and dogs, the opportunistic foraging of which resulted in an enormous increase in mortality among nesting larks. The reserve became converted into a population sink, apparently dependent for its larks solely, and ironically, on continuous immigration from neighbouring, unprotected zones.

Much more work is currently being undertaken on the conservation of European larks, especially the Eurasian Skylark, than



Like several other larks found on the iron-rich sands of south-western Africa, the ***Red Lark*** *has deep rufous upperparts which provide it with beautiful camouflage. This species is confined to a small area of red sands and clayey soils in Bushmanland. As a result of its small range and low total population of some 10,000 birds, it is currently classed as Vulnerable. Its preferred habitat is susceptible to overgrazing by cattle and other livestock, with local extinction already recorded from some parts of its range.*

[*Calendulauda burra*, Pofadder, Bushmanland, Northern Cape, South Africa. Photo: Andy & Gill Swash]

on the globally threatened species. The fact that this formerly abundant skylark should now find itself in the "Red Books" of such countries as the United Kingdom and the Netherlands is somewhat alarming, and this has triggered numerous studies and a significant increase in our knowledge of this species, and of the biology and ecology of larks in general. Populations of Eurasian Skylarks in Finland, Denmark, Germany, the Netherlands, Britain and France, at least, have been reduced to less than half of their former numbers in the space of twenty years. This apparently inexorable decline, at a rate of over 2% per year, can undoubtedly be attributed to the intensification of modern agriculture, a particular and especially harmful feature of which is the progressive replacement of spring-sown cereals by winter sowing. Such crops as winter wheat provide suitable habitat at the start of the breeding season, in April, but later, once the crops are taller than 20-25 cm, the larks abandon them and settle in tramlines, set-aside zones and other places where, unfortunately, predation is much higher than it is within the fields proper. In general, Eurasian Skylarks prefer sites where the vegetation is neither too tall nor too dense, probably because it affords them a wider field of view and allows them to move more freely when foraging. It has been noted in some places that, within cultivated areas, the larks tend to select fallow fields or patches of stunted growth, which may result from particular topographic or geological features such as karst zones, stony ground and ephemeral pools. Unfortunately, though, the increased use of fertilizers is another feature of intensive agriculture, and this leads to taller and more tightly packed growth on the one hand and to the reduction or elimination of fallow fields on the other. Intensification results in larger fields and a reduction in crop diversity, which is also detrimental to the larks, as they prefer to include three or four different land-use types within their territories. Increased application of insecticides and herbicides is also typical of modern agriculture, and these biocides, obviously, reduce the populations of the insect and weed species on which larks depend for food. With regard to food supplies, the substitution of spring-sown cereals by winter-sown ones has proved to be very deleterious, since only the former produce the stubble fields which are a favourite feeding habitat in winter for larks flocks, which exploit the large quantities of fallen grain available there. These and several other factors have combined to achieve what hunting on a massive scale never did: the endangering of the populations of Eurasian Skylarks. It is paradoxical indeed that this lark, the fortunes of which in Europe grew in historic times with the expansion of agriculture, is now seen as a "flagship species" of a conservation campaign which aims to achieve the fundamental reform of the European Union's Common Agricultural Policy (CAP), and to forestall what is coming to be known as the "Second Silent Spring".

Iberia still boasts a number of more showy flagship species, such as the Great Bustard (*Otis tarda*) and the Pin-tailed Sandgrouse (*Pterocles alchata*), which will also be invoked in this campaign, but even in Iberia several lark species are in some difficulty. The most recent edition of the Spanish Red Book, for example, lists three alaudids: Dupont's Lark is considered "Endangered", the Greater Short-toed Lark is "Vulnerable" and the Lesser Short-toed Lark is "Near-threatened". The negative trends exhibited by these and other larks seem to be due to losses or degradation of long-term fallows and shrub-steppes, resulting from such activities as the ploughing of wastelands, irrigation, the abandonment of grazing, and afforestation.

The value of the Eurasian Skylark as a hunters' target species, combined with its insignificant impact on agriculture and, perhaps, a yearning for its much-loved song, so exalted by the romantic poets of the time (see Relationship with Man), led many nineteenth-century European colonists to introduce the species to other, often far-flung parts of the globe. Skylarks were transported to many places in North America, among them Long Island, New York, where it is known that larks bred in 1887 but became extinct by 1913. They still persist, however, on Vancouver Island, in western Canada, where they were brought from Britain in 1903 at the behest of the British Columbia Natural History Society. The birds prospered there and attained a population of nearly 1000 individuals by the 1960s, when they spread to the neighbouring island of San Juan, in Washington state, USA. Since then, loss of habitat to urban development has reduced the population to barely 30 or 40 pairs, nearly all of them at or near Victoria international airport. The skylarks introduced in Hawaii have had better fortune and now occupy every major island in that group except Kauai, ranging from sea-level to altitudes of over 3000 m. The Eurasian Skylark abounds in south-eastern Australia, around the cities of Adelaide, Melbourne and Sydney, as well as in Tasmania. Finally, New Zealand received 964 skylarks from Britain, in various shipments between 1864 and 1875; by 1900, the species was well established throughout the entire country, and it remains so today. All of these introductions, harmless though they may seem, must be regretted, as should those involving any exotic species anywhere, but especially when places as ecologically unique and fragile as Hawaii or New Zealand are involved.

There can be no doubt that, in today's world, an ever-sharper link exists between the ecology and populations of birds, on the one hand, and ongoing changes in the human socio-economic background, on the other. There is no better example of this among the Alaudidae than that afforded by the Crested Lark. This is a



The South African Grasslands EBA is home to two very rare larks. The commoner of these, ***Botha's Lark****, has a population of 1500-5000 individuals, and is currently treated as Endangered. Not only is it not found in any officially protected area, but its range falls almost entirely within privately owned land, so the success of conservation action hinges on effective communication and co-operation with landowners. Fortunately, it prefers short grassland with bare areas, and is thus favoured by grazing.*

[*Spizocorys fringillaris*,
Wakkerstroom,
Kwa-Zulu Natal,
South Africa.
Photo: Andy & Gill Swash]



***Rudd's Lark** is patchily distributed, with a total range of less than 500 km². Even within the core of its range in the eastern Free State and around Wakkerstroom it is localized and thinly spread, although quite why this should be remains unclear. It prefers a mix of moderately and heavily grazed pastures lying at 1600-1800 m above sea-level, and receiving over 600 mm of rain per annum. Sadly, this habitat is threatened by agriculture and afforestation. The proposed Grassland Biosphere Reserve centred on Wakkerstroom and Volkrust would go some way towards protecting a unique grassland ecosystem.*

[*Heteromirafra ruddi*, Wakkerstroom, Kwa-Zulu Natal, South Africa. Photo: Warwick Tarboton]

widely distributed species, essentially an inhabitant of steppe habitats and, in the case of some of its subspecies, true deserts. In Europe, it was traditionally associated with farmland, but here it frequented not so much the fields of crops but, rather, their shrubby margins, as well as tracks and roadsides and the outskirts of villages. The Crested Lark underwent a spectacular northward expansion throughout the nineteenth century and during the early years of the twentieth century, eventually colonizing places as far north as southern Scandinavia. It took advantage, it would seem, of the expansion of the road network, where it fed on insects and semi-digested grain in horse dung, and of industrial and urban development, which gave rise to places of a steppe-like aspect such as building sites, railway stations, airfields, industrial parks, gravel pits and rubbish dumps. It colonized many city centres, making use of Second World War bombsites, and scrounging tamely for food scraps alongside the sparrows in public places. In the last few decades, however, the Crested Lark has experienced a reversal in its fortunes and it now finds itself in retreat, having already disappeared from countries such as Norway, Sweden and Switzerland, and with only a token presence remaining in others, such as Germany. In Niedersachsen, for example, its population in 1998 was estimated at about 1% of that in 1966. The numerous factors invoked to explain this decline include the replacement of horses by motor vehicles, the trend for high-density building, acid rain, climate change and, not surprisingly, changes in farming practices. This last seems to have had a particularly harmful impact on the habitat of the Crested Lark as a consequence of the excessive use of nitrogenous fertilizers. Wastelands which were previously suitable have become overgrown with tall weed growth, producing damper environments and cooler ground temperatures, both of which appear to have a very negative impact on the lark's reproductive success. It is probably habitat scarcity that has made it increasingly common for Crested Larks in Central Europe to be seen to make use of traffic roundabouts and the central reservations of motorways; in recent years, they have, moreover, started to nest on flat rooftops, in some cases, as has been recorded in Moravia, even 14 floors up. These larks, denizens of the steppes but now finding refuge atop high buildings, point to the sad destiny which our implacable transformation of the environment is imposing upon the natural world.

*Of all larks, the **Raso Lark** is perhaps the most likely to slide into extinction. Restricted to the island of Raso, some 500 km off the coast of Senegal, the population fluctuates between 40 and 250 individuals. It cannot increase above this limit because of the island's size (roughly 7 km²). This effectively renders the species highly vulnerable to prolonged drought, or to the accidental introduction of mammalian predators, such as cats or rats. As such, it is classed as Critical and requires constant monitoring.*



[*Alauda razae*, Raso Island, Cape Verde Islands. Photo: Michael Brooke]

General Bibliography

Afik *et al.* (1991), Alström (1998), Ames (1971), Ash (1951), Barker *et al.* (2001), Bennett & Peirce (1990), Bernis (1995), Bock (1994), Brown, A.J. (1986), Casselton (1984), Charlez (1990), Cooper & Donnelly (1983), Cowan & Brown (2001), Cracraft (1981), Dean (1989a), Dean & Hockey (1989), Dean & Siegfried (1997), Dickinson, Dekker, Eck & Somadikarta (2001), Donald, Green & Heath (2001), Ericson *et al.* (2003), Fahse *et al.* (1998), Fry (1992), Green (1985), Groth (1998), Harrison, C.J.O. (1966, 1982, 1986), de Juana *et al.* (1993), Kozlova (1981), Krebs *et al.* (1999), Mayr & Greenway (1960), Meinertzhagen (1951), Møller (1996b), Moreau (1966), Olson (1985), Pätzold (1994, 2003), Read (1991), Sheldon & Gill (1996), Sibley (1996), Sibley & Ahlquist (1990), Sibley & Monroe (1990, 1993), Sibley *et al.* (1988), Simms (1992), Tellería *et al.* (1988), Thompson (1936), Tieleman (2002), Tieleman, Williams & Bloomer (2002), Vaurie (1954a, 1955), Verheyen (1958, 1959), Voous (1977), White (1952, 1959b, 1961a), Williams & Tieleman (2001), Winterbottom (1972a), Yesilevskaya (1972, 1986).



PLATE 53

inches 4

cm 10

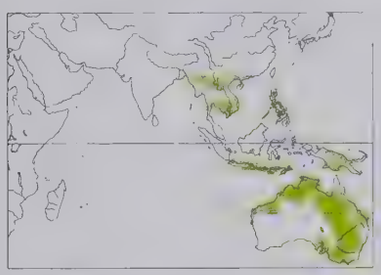
Genus *MIRAFRA* Horsfield, 1821

1. Australasian Bushlark

Mirafra javanica

French: Alouette de Java **German**: Horsfieldlerche **Spanish**: Alondra de Java
Other common names: Australasian Lark, Singing Bushlark(!), Eastern (Singing) Bushlark, Horsfield's Bushlark; Cinnamon Lark (*woodwardi*); Javan Lark (*javanica*)

Taxonomy. *Mirafra Javanica* Horsfield, 1821, Java.
Relationship with African congeners not known. Has sometimes been placed in a superspecies with *M. cantillans*, *M. albicauda*, *M. passerina* and *M. cheniana*, but validity of this grouping remains untested. Often treated as conspecific with *M. cantillans*, and probably closest to and sister-taxon of that species, from which it differs by 1·8% in cytochrome *b* sequences. Geographical variation to some extent correlated with colour of local soil substrate and regional humidity, and there is much presumed convergence in appearance among taxa; only Australian and mainland SE Asian races revised recently, and further study needed. Race *woodwardi* sometimes considered a separate species. Otherwise, described race *beaulieui* (S Vietnam) is synonymized with *williamsoni*, *sepikiana* (N New Guinea) with *aliena*, *subrufescens* (NW Australia) with *forresti*, *normantoni* (NE Australia) with *rufescens*, and *keasti* (SE South Australia) with *horsfieldi*. Sixteen subspecies currently recognized.
Subspecies and Distribution.
M. j. williamsoni Stuart Baker, 1915 - locally in Myanmar, Thailand, Cambodia, Laos, Vietnam and extreme S China (including N Hainan).
M. j. philippinensis R. G. W. Ramsay, 1886 - N Philippines (Luzon, Mindoro).
M. j. mindanensis Hachisuka, 1931 - S Philippines (Negros, Mindanao).
M. j. javanica Horsfield, 1821 - S Borneo, Java and Bali.
M. j. parva Swinhoe, 1871 - Lesser Sundas (Lombok, Sumbawa, Sumba, Flores).
M. j. timorensis Mayr, 1944 - Sawu and Timor.
M. j. aliena Greenway, 1935 – N, NE & S New Guinea.
M. j. melvillensis Mathews, 1912 - Melville I, N Australia.
M. j. halli Bianchi, 1907 - N Western Australia.
M. j. woodwardi Milligan, 1901 - extreme NW Western Australia.
M. j. forresti Mayr & McEvey, 1960 - NE Western Australia.
M. j. soderbergi Mathews, 1921 - N Australia (N Northern Territory).
M. j. rufescens Ingram, 1906 - E Northern Territory, NW Queensland and NE South Australia.
M. j. athertonensis Schodde & Mason, 1999 - NE Queensland (Atherton-Evelyn Tablelands).
M. j. secunda Sharpe, 1890 - S South Australia.
M. j. horsfieldii Gould, 1847 - SE Australia.



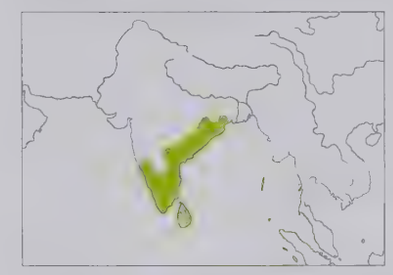
Descriptive notes. 13·5-15 cm. Large-billed lark with fairly short tail and wings. Nominate race has fairly indistinct head pattern, with buffish supercilium; rather dark grey-brown above, with heavy but not very contrasting blackish-brown streaks on crown and mantle (but poorly streaked nape), in fresh plumage mantle and scapulars with buffish fringes, notably on edges of inner webs, also blackish-brown upperwing-coverts and tertials with buffish or rufous-buff tips and edges; flight-feathers broadly edged rufous (most noticeable in flight), outer tail feathers extensively white; pale rufous-buff below, more rufous on breast, breast rather sparsely, faintly and finely streaked dark; iris dark brown or dark grey-brown; upper mandible mainly grey, lower mandible pinkish or greyish-yellow; legs dull pink. Differs from *M. cantillans* in darker upperparts. Sexes alike in plumage, female on average smaller. Juvenile differs from adult mainly in having narrow pale buffish tips on crown, back, rump and uppertail-coverts, and lacking broad pale edges of mantle feathers, also has more clearcut pale tips and edges of wing-coverts. Races differ mainly in general plumage coloration and saturation, and strength of streaking: e.g. *woodwardi*, *rufescens*, *melvillensis*, *athertonensis* and *secunda* are notably rufous-tinged, while especially *halli* and *horsfieldii* are markedly grey above and pale buffish below. Voice. Song, either from perch (usually not high) or in towering song flight, of rather short, varied strophes (frequently including imitations of other birds) generally delivered at intervals of c. 1-2 seconds, may continue for lengthy periods. Sharp, rapid, almost explosive alarm calls.
Habitat. Favours open habitats, such as grasslands with scattered bushes and trees, stubble fields and fallow cultivation. Lowlands and middle elevations; to 1680 m in New Guinea.
Food and Feeding. Poorly known. Takes seeds (especially of Gramineae) and insects, e.g. beetles (Coleoptera), ants (Formicidae) and caterpillars. Forages on ground, singly, in pairs or in small, loose groups.
Breeding. Little studied. Season in SE Asia probably mid-Feb or late Feb to at least late Jul; Sept-Apr in Australia (Sept-Jan in S, in N timing depends on onset of rains). Hovering song flight high in sky, with stiff, quivering wings and folded tail. Nest in depression on ground, generally sheltered by tussock, made of grass and rootlets, sometimes hair included, either open or partly or completely domed. Clutch 2-4 eggs; no information on incubation and fledging periods; reports that both sexes incubate require confirmation.
Movements. Mainly sedentary or, at least in Australia, locally and regionally nomadic.
Status and Conservation. Not globally threatened. Locally fairly common through much of range; uncommon in Philippines. No population estimates available for any region.
Bibliography. Alström (2002), Alström *et al.* (2004), Beehler *et al.* (1986), Blakers *et al.* (1984), Bourne (1947), Bravery (1962), Cheng Tsohsin (1987), Coates (1990), Coates & Bishop (1997), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Dickinson, Kennedy & Parkes (1991), Duckworth *et al.* (1999), Eckert (1995), Frith (1976), Hall (1974), Herbert (1923), Jones *et al.* (1994), Kennedy *et al.* (2000), King *et al.* (1975), Kloot (1993), Lea & Gray (1935-1936), Lekagul & Round (1991), Macdonald (1988), MacKinnon & Phillipps (1993), Mathews (1930), Mayr & McEvey (1960), Mees (1962, 1982), Meyer de Schauensee (1984), Pätzold (1994, 2003), Pizzey & Knight (1997), Rand & Gilliard (1967), Rasmussen & Anderton (2004), Robson (2000), Round (2003), Schodde & Mason (1999), Smith (1979), Smythies (1986, 1999), Viney *et al.* (1994), Wahlberg (1990), White & Bruce (1986).

2. Jerdon's Bushlark

Mirafra affinis

French: Alouette du Dekkan **German**: Jerdonlerche **Spanish**: Alondra de Jerdon
Other common names: Rufous-winged Bushlark; Ceylon Bushlark ("*ceylonensis*")

Taxonomy. *Mirafra affinis* Blyth, 1845, southern India.
Relationship with African congeners unknown. Recently split from *M. assamica* on basis of pronounced differences in, especially, vocalizations, song flight, other behaviour, habitat choice, and cytochrome *b* gene sequences (13·4%); equally large genetic (respectively, 13·7% and 15·1%) and vocal differences from *M. erythrocephala* and *M. microptera*, both of which were also previously merged with *M. assamica*. Sri Lankan population often separated as race *ceylonensis*; further study needed. Monotypic.
Distribution. E & S India and Sri Lanka.



Descriptive notes. 13·5-15 cm. Heavy-bodied lark with large bill, short tail and wings, and rather long legs. Has relatively narrow supercilium, usually buffish in front of eye, paler buffish or whitish above and behind eye; ear-coverts pale grey-brown with inconspicuous dark eyestripe and dark streaks at rear (generally forming dark rear border), variably distinct whitish band on side of nape/rearmost ear-coverts; crown, nape and mantle rufescent grey-brown, heavily streaked; dark grey-brown or blackish-brown upperwing-coverts and tertials with buffish or rufous-buff tips and edges; remiges dark grey-brown or blackish-brown, broad rufous edges of primaries forming prominent patch (most noticeable in flight); tail dark grey-brown, buffy outer edges of, especially, outermost pair of rectrices; underparts buffish (paler when plumage worn), heavy blackish spots on breast; upper mandible mostly dark grey, lower mandible mostly pinkish; legs pinkish. Best separated from *M. erythroptera* by shorter tail, more heavily streaked upperparts (which usually less rufous-tinged in area of sympatry), also slightly longer bill and legs, less distinct head pattern, more buffish underparts (when fresh), darker-centred tertials, wing-coverts and central tail feathers, and less rufous in wings (in flight). Sexes alike in plumage, female on average smaller. Juvenile differs from adult mainly in more extensive and more clearcut dark centres and narrow pale buffish tips on crown, mantle and scapulars. Voice. Diagnostic song a drawn-out, dry, metallic rattle, "zizizizezezezezezezezezezezezezezezezezezeze", delivered from ground or, more often, from perch in top of bush, tree, on telephone wire, fence post etc., at times also in song flight. Calls a thin, drawn-out whistle and a short, thin rattle.
Habitat. Variety of open habitats, such as fallow fields with bushes and trees along margins, and scrub-covered rocky ground, to c. 1500 m. Also commonly in habitats with plenty of scrub, bamboo thickets and trees, such as forest edges, and even in scrubby glades in open forest. Frequently lands in trees when flushed.
Food and Feeding. Diet poorly known; seeds and invertebrates taken.
Breeding. Little studied. Season Dec-May, chiefly from Mar, in India; Mar-Aug/Sept, mainly May, in Sri Lanka. In short, low song flight, male ascends some metres, and then descends with wings held in shallow V-shape, tail spread, legs dangling. Nest a cup of grass, often domed, placed in depression on ground, frequently under a stone or bush. Clutch 3-4 eggs; no information on incubation and fledging periods.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Locally common throughout range. In Sri Lanka, more numerous in dry zone. No population estimates available.
Bibliography. Abdulali (1978), Ali (1969), Ali & Ripley (1987), Alström (1998, 2002), Alström *et al.* (2004), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Grimmett *et al.* (1998), Rasmussen & Anderton (2004), Ripley (1982), Srinivasulu & Srinivasulu (1997), Stuart Baker (1926, 1935), Vaurie (1951a).

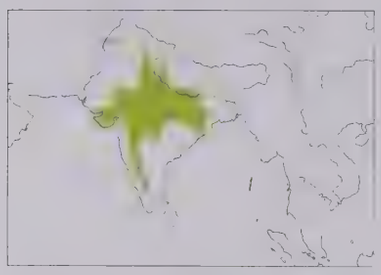
3. Indian Bushlark

Mirafra erythroptera

French: Alouette à ailes rousses **German**: Rotflügellerche **Spanish**: Alondra India
Other common names: Indian/Red-winged(!) Lark, Indian Red-winged/Rusty-winged Lark/Bushlark

Taxonomy. *Mirafra erythroptera* Blyth, 1845, northern portion of Indian Peninsula.
Relationship with African congeners unknown. Mitochondrial DNA data suggest that this species is nested within the "*M. assamica* complex", thus making latter non-monophyletic. Birds from NW of range, supposedly paler and greyer above and whiter below, sometimes recognized as race *sindiana*, but variation apparently individual rather than geographical; others, from Rajkot, in Gujarat (India), described as race *furva* on basis of longer tail and darker plumage than that form; more research needed. Monotypic.
Distribution. SE (possibly also NE) Pakistan and much of India (S Punjab, W Rajasthan and W Gujarat E to Orissa, S to S Karnataka).
Descriptive notes. 13·5-15 cm. Heavy-bodied, large-billed lark with short wings, rather short tail, moderate-length legs. Has prominent whitish or pale buffish supercilium, and band of same colour on nape side/rear ear-coverts (often widening to form whitish patch just below rear of supercilium); crown, nape and upperparts rufescent grey-brown, rather heavily streaked; upperwing-coverts and tertials medium or dark grey-brown with buffish edges; distinctively rufous flight-feathers with

On following pages: 4. Indochinese Bushlark (*Mirafra erythrocephala*); 5. Bengal Bushlark (*Mirafra assamica*); 6. Burmese Bushlark (*Mirafra microptera*); 7. Madagascar Lark (*Mirafra hova*); 8. Singing Bushlark (*Mirafra cantillans*); 9. White-tailed Lark (*Mirafra albicauda*); 10. Kordofan Lark (*Mirafra cordofanica*); 11. Williams's Lark (*Mirafra williamsi*); 12. Rusty Lark (*Mirafra rufa*); 13. Monotonous Lark (*Mirafra passerina*); 14. Melodious Lark (*Mirafra cheniana*); 15. Friedmann's Lark (*Mirafra pulpa*); 16. Ash's Lark (*Mirafra ashi*); 17. Somali Long-billed Lark (*Mirafra somalica*); 18. Red-winged Lark (*Mirafra hypermetra*).



dark tips (most noticeable in flight); tail mostly blackish, central feathers browner, outer edge of outermost pair buffish or buffish-white; whitish or pale buffish underside, breast with large blackish-brown spots; iris warm brown; bill mostly pinkish, grey culmen; legs pink. Differs from *M. affinis* primarily in having longer tail and less heavily streaked upperparts (which usually more rufous-tinged in area of sympatry), also slightly shorter bill and legs, more distinct head pattern, whiter underparts (when fresh), paler-centred tertials, wing-coverts and central tail feathers, and more rufous in wings (in flight); from *M. assamica* in overall paler and more contrastingly patterned plumage. Sexes alike in plumage, female on average smaller. Juvenile has more extensive and more clearcut dark feather centres and more distinct pale buffish tips on crown, mantle and scapulars. Voice. Song, given from ground or low perch or in short, low flight, consists of clear whistles alternating in length and pitch, frequently more drawn-out towards end of strophe; an uncommon song type, delivered in more prolonged song flight, is a rambling mixture of typical song notes and calls. Calls with drawn-out whistles and rattles, often combined.

Habitat. Arid, preferably somewhat scrubby and often rocky areas in lowlands.

Food and Feeding. Diet poorly known; seeds and invertebrates taken.

Breeding. Little studied. Mar-Oct, probably mainly May-Jul; often, perhaps usually, at least two broods. In common type of song flight, male rises some metres, then descends with wings slightly raised, tail spread, legs dangling. Nest, believed built mostly by female, a cup of grass, often domed, placed in depression on ground, frequently under a stone or bush. Clutch 3-4 eggs, occasionally 2; female believed to undertake most of incubation, assisted by male, male assists also in feeding of young; incubation and fledging periods not documented.

Movements. Sedentary; possibly some short-distance movements. May be only non-breeding visitor to NE Pakistan.

Status and Conservation. Not globally threatened. Widespread and locally common in most of range. No population estimates. Status in NE Pakistan (Salt Range) uncertain; further fieldwork required.

Bibliography. Ali (1996), Ali & Ripley (1987), Alström (2002), Alström et al. (2004), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Grimmett et al. (1998), Kirkpatrick (1954a), Mukherjee (1995), Pätzold (1994, 2003), Rasmussen & Anderton (2004), Ripley (1982), Roberts (1992), Santharam (1980), Shukla & Shrivastava (1985), Stuart Baker (1926, 1935), Vaurie (1951a).

4. Indochinese Bushlark

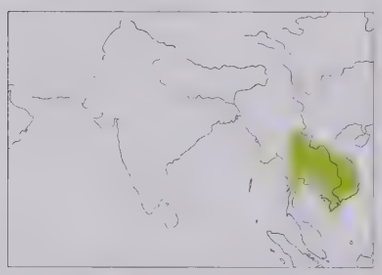
Mirafra erythrocephala

French: Alouette d'Indochine **German**: Indochinalerche **Spanish**: Alondra Indochina
Other common names: Rufous-winged Bushlark, Bush Lark

Taxonomy. *Mirafra erythrocephala* Salvadori and Giglioli, 1885, Cochinchina.

Specific name frequently given as *marionae*, but that is predated by present name. Relationship with African congeners unknown. Recently split from *M. assamica* on basis mainly of pronounced differences in vocalizations, song flight, other behaviour, habitat choice and cytochrome *b* gene sequences (14·8%); equally large genetic (respectively, 13·7% and 11·7%) and vocal differences from *M. affinis* and *M. microptera*, both of which were also previously considered conspecific with *M. assamica*. Birds from NW Thailand sometimes separated as race *subsessor*. Monotypic.

Distribution. S Myanmar (Tenasserim), Thailand (except most of peninsula and extreme SE), Cambodia, S & C Laos and S Vietnam.



Descriptive notes. c. 15 cm. Heavy-bodied lark with large bill, short tail and wings, rather long legs. Has whitish supercilium, pale buffish-brown ear-coverts with fairly distinct streaking and quite distinct dark eyestripe and rear border, usually a thin whitish band across upper nape; rather dark greyish-brown or brown-grey above, crown usually more rufous-tinged, crown, mantle and scapulars rather heavily streaked; wings dark grey-brown or blackish-brown, upperwing-coverts and tertials with buffish or rufous-buffish tips and edges, broad rufous edges of primaries forming prominent patch (most noticeable in flight); tail dark grey-brown with indistinct rufous-tinged outer edges, widest on outermost rectrix; underparts dingy buffish, breast heavily dark-spotted; upper mandible mostly dark grey, lower mandible mostly pinkish; legs pinkish. Distinguished from very similar *M. microptera* by darker, greyer, less distinctly streaked upperparts, slightly darker and dingier underparts, whiter supercilium, less buffish and more distinctly streaked ear-coverts, and whitish nuchal band. Sexes alike in plumage, female on average smaller. Juvenile differs mainly in having more extensive and more distinct dark centres and narrow pale tips on crown, mantle and scapulars. Voice. Song quick series of thin, clear, mostly drawn-out notes, arranged in strophes of c. 2-8 seconds in duration, given from ground or, more often, from elevated perch, sometimes in flight. Calls a high-pitched, metallic "tirrrrrrrrrrrrrrrrrrrrrrrr" rattle, also short series of thin, high-pitched, highly variable whistles, often combined with the rattle.

Habitat. Various open, dry areas with scattered trees and bushes, including cultivation, also forest edge with plentiful scrub, bamboo thickets and trees; to 900 m. Often flies to nearby tree perch when flushed.

Food and Feeding. Nothing known of diet; probably similar to that of *M. assamica* and other close relatives.

Breeding. Not studied. Season Mar-Aug. Male has short, low song flight, in which he rises some metres, then descends with wings slightly raised, tail spread, legs dangling. No other relevant information available.

Movements. Sedentary.

Status and Conservation. Not globally threatened. Locally common throughout range. No population estimates.

Bibliography. Alström (1998, 2002), Alström *et al.* (2004), Deignan (1945), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Duckworth *et al.* (1999), Eames & Robson (1992), Lekagul & Round (1991), Robson (2000), Violani & Barbagli (1999).

5. Bengal Bushlark

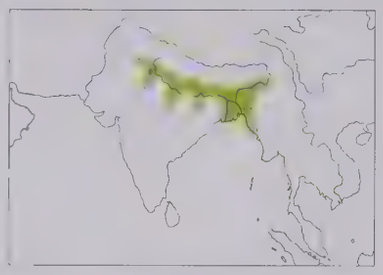
Mirafra assamica

French: Alouette d'Assam **German**: Bengalenlerche **Spanish**: Alondra de Assam
Other common names: Bush Lark, Rufous-winged Lark/Bushlark, Collared Lark(!)

Taxonomy. *Mirafra Assamica* Horsfield, 1840, Assam, India.

Relationship with African congeners unknown. Formerly treated as a polytypic species, including *M. affinis*, *M. erythrocephala* and *M. microptera* as races, but differs from all those in vocalizations, song flight, other aspects of behaviour and habitat choice. Mitochondrial DNA data suggest that the "*M. assamica* complex" is non-monophyletic, since *M. erythroptera* is nested within this group, and also that the various taxa diverged a considerably longer time ago than is indicated by the rather small morphological differences (pairwise genetic divergences in the cytochrome *b* gene 11·7-15·1%). More distantly related to *M. javanica* and *M. cantillans*. Monotypic.

Distribution. N India and S Nepal E to Bhutan, Bangladesh and extreme W Myanmar.



Descriptive notes. 16 cm. Heavy-bodied lark with large bill, short tail and wings, rather long legs. Has buffish supercilium (greyish-white when plumage worn); rather dark brown-grey or grey-brown above, crown, mantle and scapulars with moderately distinct dark streaks, nape indistinctly streaked; wings dark grey-brown or blackish-brown, upperwing-coverts and tertials with buffish or rufous-buffish tips and edges, broad rufous edges of primaries forming prominent rufous patch (most noticeable in flight); tail dark grey-brown, outer web of outermost rectrix rufous-buff (pale buffish when worn); underparts rufous-buff (paler when worn), breast with moderately heavy dark streaks; iris brown; bill mostly dark grey above and pinkish below; legs pink. Distinguished from e.g. *M. affinis*, *M. microptera* and *M. erythroptera* in overall darker and less contrastingly patterned plumage. Sexes alike in plumage, female on average smaller. Juvenile differs mainly in showing more extensive and more clearcut dark centres and narrow pale tips on crown, mantle and scapulars. Voice. Song a characteristic monotonous repetition of a thin, slightly harsh, squeaky, disyllabic note, usually given in flight; less common song, mainly from ground or low perch, rarely in flight, a jingle of short, varied notes and mimicry. Call a short, explosive series of mainly high-pitched notes.

Habitat. Open grassland and fields in plains, generally, but not necessarily, with scattered bushes and trees; sometimes rather wet. Almost entirely terrestrial.

Food and Feeding. Diet poorly known; includes seeds and invertebrates.

Breeding. Little studied. Mar-Aug, mainly May and Jun. Male has high, undulating, sustained song flight, flies in random "circles", alternating quick wingbeats with short glides on spread and slightly raised wings and spread tail. Nest a cup of grass, sometimes domed, in depression on ground. Clutch 3-4 eggs; incubation and fledging periods not documented.

Movements. Sedentary.

Status and Conservation. Not globally threatened. Widespread and locally common throughout range. No population estimates.

Bibliography. Abdulali (1976), Ali & Ripley (1987), Alström (1998, 2002), Alström *et al.* (2004), Ball (1874, 1878), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Khan (1988), Macdonald (1906), McClure (1998), Pätzold (1994, 2003), Rasmussen & Anderton (2004), Ripley (1982), Robson (2000), Sharma (1994), Singh (1994), Smythies (1986), Stuart Baker (1926, 1935), Vaurie (1951a).

6. Burmese Bushlark

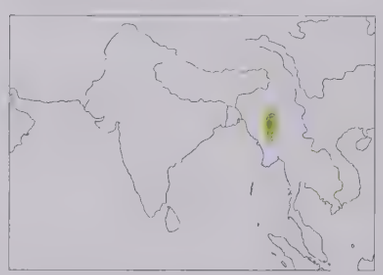
Mirafra microptera

French: Alouette de Birmanie **German**: Burmalerche **Spanish**: Alondra Birmana
Other common names: Rufous-winged Bushlark

Taxonomy. *Mirafra microptera* Hume, 1873, Thayetmyo, Myanmar.

Relationship with African congeners unknown. Formerly treated as conspecific with *M. assamica*, but pronounced differences in, especially, vocalizations, song flight, other behaviour, habitat choice, and cytochrome *b* gene sequences (13·2%); equally large genetic (respectively, 15·1% and 11·7%) and vocal differences from *M. affinis* and *M. erythrocephala*, both of which were also previously considered conspecific with *M. assamica*. Monotypic.

Distribution. C Myanmar.



Descriptive notes. 13·5-15 cm. Heavy-bodied, large-billed lark with short tail and wings, rather long legs. Has prominent buffish supercilium, buffish-brown ear-coverts (usually with dark eyestripe and rear border), whitish band on nape side/rearmost ear-coverts (often widening to form a whitish patch just below rear of supercilium); warm brownish-buff or rufescent grey-brown above, crown, nape, mantle and scapulars heavily streaked; wings dark grey-brown or blackish-brown, upperwing-coverts and tertials with buffish or rufous-buffish tips and edges, broad rufous edges of primaries forming prominent rufous patch (most noticeable in flight); blackish outer tail feathers with pale buffish or buffish-white outer web of outermost rectrix; underparts very pale buffish or whitish, breast heavily dark-spotted; bill mostly dark grey above and pinkish below; tarsus and toes pinkish. Distinguished from *M. affinis* by paler and more uniform underparts, more contrasting black breast spots, slightly more distinct head pattern; from *M. erythrocephala* mainly by paler, browner, more distinctly streaked upperparts, paler and cleaner underparts, more buffish supercilium, more buffish and less streaked ear-coverts, no thin whitish nuchal band. Sexes alike, female on average smaller. Juvenile undescribed. Voice. Three different song types: commonest a short, hurried jingle of varied high-pitched whistles, given from perch (often rather high); another type is series of high-pitched, mostly drawn-out whistles, given in short, low song flight, or from ground, or from low perch; third type,

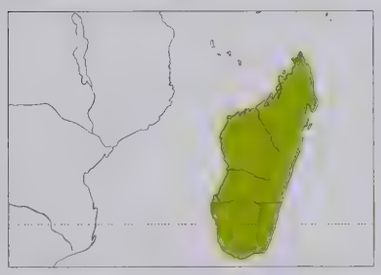
basically like first but with longer strophes and shorter pauses, given in high, prolonged song flight, frequently ends (during descent) with second song type. Commonest calls a short high-pitched "heep" and a series of high-pitched whistled rattles.
Habitat. Open areas with scattered bushes and trees, including cultivation, also more barren habitats such as sandy fallow fields. Frequently perches in trees, and on telephone wires and buildings (e.g. ancient temple ruins).
Food and Feeding. No information on diet; probably similar to that of *M. assamica* and other close relatives.
Breeding. Little studied. Often begins in late Mar, but probably mainly from May-Jun, and may continue until Oct. Male has sustained, high song flight, flies in erratic "circles" with quick, slightly jerky wingbeats and spread tail, rarely also very short glides on spread wings; also short, low song flight, rises some metres, then descends with wings slightly raised, tail spread, legs dangling. Nest a domed cup of grass with side entrance, on ground, often sheltered by tuft of grass, clod of earth or small bush. Clutch 2-4 eggs; incubation and fledging periods not documented.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Locally common to very common, but has small range. No population estimates available.
Bibliography. Alström (1998, 2002), Alström *et al.* (2004), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Robson (2000).

7. Madagascar Lark

Mirafra hova

French: Alouette malgache **German**: Hovalerche **Spanish**: Alondra Malgache
Other common names: Madagascar Bushlark, Hova Lark

Taxonomy. *Mirafra hova* Hartlaub, 1860, St Augustine Bay, Madagascar.
Relationships uncertain; exhibits close affinities to smaller congeners of Africa and Asia. On other hand, has been suggested as belonging in genus *Calandrella*. Monotypic.
Distribution. Madagascar.



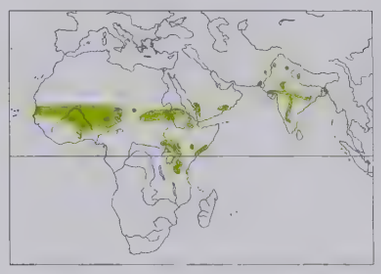
Descriptive notes. 13 cm. Rather small, compact lark with shortish, stout bill. Plumage is pale brown, streaked dark brown, above, contour feathers having buff fringes in fresh plumage (but these often worn away); prominent crown streaking contrasts with broad, pale grey-brown to buffy supercilium; narrow dark eyestripe, and broader moustachial stripe forking under eye and forming distinctive "teardrop" mark; flight-feathers brown with narrow paler fringes; underparts whitish to pale buff, breast with heavy dark streaking, flanks and undertail-coverts washed darker buff; eyes dark brown; bill pinkish to orange-flesh, sometimes with darker grey upper half of maxilla; legs pale, pinkish-flesh to brownish-flesh. Sexes alike. Juvenile undescribed; probably more boldly patterned, with pale feather fringes above and spotted, rather than streaked, breast. Voice. Male has varied, musical song, typically delivered in display-flight, also from perch or even on ground.
Habitat. Virtually any open habitat, ranging from grassland and dry shrubland to open woodland, and roads; from sea-level to at least 2500 m.
Food and Feeding. Diet little recorded; seeds, e.g. grass seeds and rice, and insects, including grasshoppers (Acrididae). Forages on ground, occasionally digging with bill or gleaning from low vegetation. Occurs in small groups of 3-6 individuals when not breeding.
Breeding. Breeding occurs throughout the year. Monogamous. Male advertises territory primarily through aerial display, circling, or flying into the wind, at up to 150 m above ground. Nest an open bowl, lined with fine grasses, built in shallow depression in ground at base of a grass tuft or against a piece of wood, with "apron" of wood, bark or mud clumps around nest edge (especially on unsheltered side). Clutch 2 eggs; no information on incubation and fledging periods; when disturbed at nest, adult often feigns injury, scurrying away with wings fluttering or half-spread.
Movements. Little known; presumably mostly resident.
Status and Conservation. Not globally threatened. Common to abundant throughout Madagascar. Has almost certainly benefited from forest clearance, and has adapted to agricultural lands, including dry rice paddies.
Bibliography. Benson *et al.* (1976-1977), Collin & Collin (1996), Dee (1986), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Langrand (1995), Milon *et al.* (1973), Ramanitra (1995), Rand (1936), Sinclair & Langrand (1998), van Someren (1947), Young (1995).

8. Singing Bushlark

Mirafra cantillans

French: Alouette chanteuse **German**: Buschlerche **Spanish**: Alondra Cantarina
Other common names: Singing Lark, Western Singing Bushlark; African Singing Bushlark (*chadensis*, *marginata*)

Taxonomy. *Mirafra cantillans* Blyth, 1845, India.
Has been placed in a superspecies with *M. javanica*, *M. albicauda*, *M. passerina* and *M. cheniana*, but validity of this grouping remains untested. Frequently treated as conspecific with *M. javanica*, and probably closest to and sister-taxon of that species, from which it differs by 1·8% in cytochrome *b* sequences. Some evidence that disjunct nominate race of Indian Subcontinent is distinct from the Afrotropical populations; further study needed. Four subspecies recognized.
Subspecies and Distribution.
M. c. chadensis Alexander, 1908 - Sahel zone of Africa from Senegal E to W Eritrea.
M. c. marginata Hawker, 1898 - S Eritrea, NE Ethiopia, NW & S Somalia, S Sudan, NE Uganda, NW, C & S Kenya and NE Tanzania.
M. c. simplex (Heuglin, 1868) - SW Saudi Arabia, Yemen and W Oman.
M. c. cantillans Blyth, 1845 - N & S Pakistan, India, W Nepal and SE Bangladesh.
Descriptive notes. 13 cm; 15-21 g. Small, compact lark with shortish, stubby bill. Nominate race has prominent whitish or pale buff supercilium contrasting with brownish-buff ear-coverts, latter further accentuated by pale collar separating them from rather dark, heavily streaked neck side; crown and upperparts grey-brown and streaked, mantle and back with broad pale feather edges (less conspicuous in worn plumage); flight-feathers have narrow rufous or sandy-buff margins



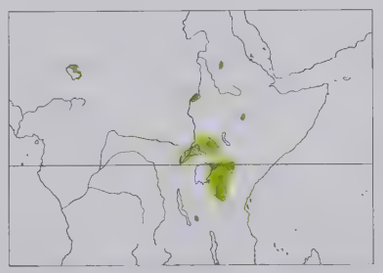
(can be lost with wear); tail grey-brown, white outer feathers (obvious in flight); throat white, rest of underparts pale buff, breast browner with small darker spots (variable, spotting sometimes indistinct or lacking); eyes dark brown; bill pinkish-horn, darker and greyer on upper mandible; legs fleshy pink. Distinguished from e.g. *M. assamica*, *M. affinis* and *M. microptera* mainly by much more extensive white in tail, less obvious rufous wing patches and, typically, less heavily streaked breast. Sexes alike. Juvenile has broad pale fringes above, more diffuse, rounded spotting on breast. Races differ primarily in plumage tone and extent of streaking: *simplex* has upperparts somewhat warmer and browner; *marginata* is slightly darker above, more heavily streaked on sides of breast; *chadensis* is paler, more sandy-coloured and less heavily streaked above. Voice. Male's song a varied series of chirps, whistles and buzzes, elements repeated in different combinations, but typically ends with buzzy trill, given either from low perch or ground in series lasting 5-10 seconds, or more or less continuously during aerial display; in Indian Subcontinent (nominate race) song more varied, with longer elements and frequent changes in pace, also accomplished mimicry incorporating song elements of almost all other species found in same range (African races not known to mimic other species). Usually silent when flushed.
Habitat. Fairly short grassland and open acacia (*Acacia*) savanna; also in cultivated land, provided that crops are short and dense enough to provide cover. In Yemen, recorded mostly in cultivated areas. In Africa, breeds in areas of taller, dry grass that have not been burnt recently. Lowlands and foothills.
Food and Feeding. Food a mix of insects and seeds (mostly of grasses). Stomach contents of birds from Senegal mainly insects, with grasshoppers (Acrididae) 85% (mostly instars of *Oedalus senegalensis*), beetles (Coleoptera) 7% and seeds only 5%, also small numbers of caterpillars and solifugids. Seeds increased in diet after crops sprayed for control of insect pests. Forages on ground, picking food from ground surface or gleaning from low vegetation; occasionally digs with bill. Grit regular in stomachs, with greater abundance and frequency in juveniles. When flushed, frequently hovers briefly before dropping almost vertically back into grass.
Breeding. Breeding synchronized with local rains; mostly May-Oct in Sahel (nesting commenced within 6 days of rain in N Senegal), and Nov-Jan and Apr-Jun in E Africa; Mar-Sept (mostly Jun-Sept) in Indian Subcontinent. Probably monogamous. Male advertises territory by aerial or perched singing, has protracted aerial display with single flights lasting 40 minutes or longer. Nest a shallow cup built of grasses, lined with fine vegetation, on ground, usually next to or under a grass tuft, usually with partial or complete dome woven into the tuft; in Senegal, most nests face N or NE, away from prevailing winds (which bend grass tufts towards N, but also provide shade). Clutch 2-4 eggs (mean 3·6 in Africa); no information on parental duties or incubation and fledgling periods. In Senegal study success was low, with hatching 15-24% and fledging 49-55%, giving overall breeding success of 7-13%; predation was thought to be main cause of failure.
Movements. Poorly understood. Sahel population assumed to be partly migratory, at least in W Africa, with post-breeding movement S into more mesic savanna during dry season. Moves into semi-arid areas of E Africa following good rains, but unclear whether this is migration or simply nomadism; scattered records from C Tanzania all outside breeding season, suggesting dispersal S after breeding, as occurs with other species (e.g. *Eremopterix leucotis*). May be only summer visitor in Oman. In Indian Subcontinent some short local movements reported, but little information.
Status and Conservation. Not globally threatened. Locally common or even abundant in Africa; very local in Indian Subcontinent, where scarce in Pakistan and rare in Nepal, frequent but very localized in India. Relative abundance often difficult to assess, as this species is easily overlooked when not displaying; creeps on the ground and is reluctant to flush. Densities of 2-4 males/ha in Africa, but species is patchy and not predictable in many areas. Probably adversely affected locally by poor grazing practices, but it remains common within much of its extensive range. Its reliance on semi-arid areas for breeding results in comparatively little suitable habitat being lost to cultivation.
Bibliography. Ali (1996), Ali & Ripley (1987), Alström (2002), Archer & Godman (1937-1961), Ash (1992b), Ash & Miskell (1998), Bannerman (1953), Barlow *et al.* (1997), Borrow & Demey (2001), Byaruhanga *et al.* (2001), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Grimmett *et al.* (1998), Jennings (1995), Jones (1991), Keith *et al.* (1992), Lees-Smith (1986), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1970), Morel (1981), Mukherjee (1995), Mullié & Keith (1991, 1993), Nikolaus (1987), Porter *et al.* (1996), Ripley (1982), Roberts (1992), Sagar Baral (1998), Short *et al.* (1990), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

9. White-tailed Lark

Mirafra albicauda

French: Alouette à queue blanche **German**: Weißschwanzlerche **Spanish**: Alondra Coliblanca
Other common names: White-tailed Bushlark, Northern White-tailed Lark/Bushlark

Taxonomy. *Mirafra albicauda* Reichenow, 1891, Gonda, Tabora District, Tanzania.
Has been placed in a superspecies with *M. javanica*, *M. cantillans*, *M. passerina* and *M. cheniana*, although this grouping remains to be tested. Apparently isolated population in SW Tanzania originally separated as race *rukwensis*, but this treatment considered unwarranted. Monotypic.
Distribution. Locally in Chad (L Chad), E Sudan, SC Ethiopia, NE DRCongo, Uganda, NW & SW Kenya and N & SW Tanzania.



Descriptive notes. 13 cm; 20-25 g. Small, compact lark with shortish, stout bill. Has prominent pale lores and supercilium, contrasting with brownish ear-coverts, latter separated from rather heavily streaked neck side by pale collar; crown and upperparts dark grey-brown with broad blackish feather centers, in fresh plumage mantle and back with contrasting paler buff-brown margins, imparting streaked appearance; flight-feathers have pale rufous-buff margins; tail grey-brown, outer feathers with much white; throat white, rest of underparts pale buff, heavily streaked dark on breast; eyes dark brown; bill dark slate above, pale

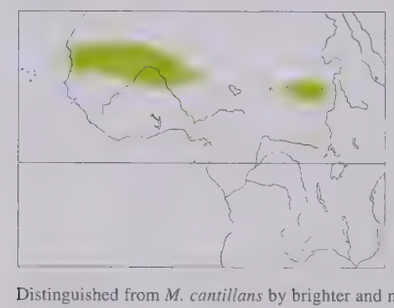
pinkish below, looks slightly upturned; legs flesh-brown. Distinguished from *M. cantillans* (of race *marginata*) by darker appearance of upperparts, more heavily streaked breast, more distinctly two-toned bill, less rufous-looking remiges in flight; from *M. pulpa* by blacker feather centres on upperparts, lacking rufous tones, slightly larger bill. Sexes alike. Juvenile has pale fringes on upperparts, appearing scaled. VOICE. Male display song a long, rambling series of chirps and whistles, less varied than that of *M. cantillans* and typically lacking latter's bubbling trills.
Habitat. Prefers dense, fairly short grassland, usually on black-cotton soils; often found around lake margins. Typically avoids open areas.
Food and Feeding. Food includes insects, e.g. grasshoppers (Acrididae), also seeds and other vegetable matter. Forages terrestrially, picking food from ground or gleaning from low vegetation. When flushed, flies a short distance and then drops sharply into dense grass, much as *M. cantillans*.
Breeding. Recorded Mar-May. Male sings in protracted aerial display, circling over territory and then dropping steeply to ground. Nest a shallow cup lined with dry grass, placed on ground, usually next to a grass tuft, often at edge of fairly open area in dense grassland; apparently does not build dome over nest, but in muddy sites nest may have a distinct mud rim. Clutch 2 eggs, but few nests found; no information on parental duties or incubation and fledging periods.
Movements. Little known. Probably resident.
Status and Conservation. Not globally threatened. Generally uncommon; locally common in parts of E Africa. Often hard to observe on ground and, except when displaying, is easily overlooked. No evidence of habitat loss, but agriculture has probably had adverse effect on the species in at least some areas.
Bibliography. Ash (1992b), Bannerman (1953), Borrow & Demey (2001), Butler (1905), Byaruhanga *et al.* (2001), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1970), Nikolaus (1987), Safford (1993), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Vesey-Fitzgerald (1957), Zimmerman *et al.* (1996).

10. Kordofan Lark

Mirafra cordofanica

French: Alouette du Kordofan **German**: Kordofanlerche **Spanish**: Alondra del Kordofán
Other common names: Kordofan Bushlark, Golden Lark

Taxonomy. *Mirafra cordofanica* Strickland, 1852, Kordofan, Sudan.
Monotypic.
Distribution. Mauritania and N Senegal E to Mali, N Burkina Faso and W Niger, also E Chad and C Sudan.



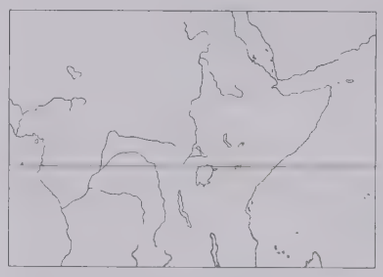
Descriptive notes. 14 cm. Fairly small, compact lark with distinctive golden-rufous upperparts only lightly streaked darker brown. Has buffish-white supercilium and face with only narrow dark eyestripe, giving pale-faced appearance (enhanced by whitish bill); in fresh plumage, some back feathers have narrow pale fringes and darker subterminal bars; tail blackish, central feathers golden-rufous and outer tail white (distinctive in flight); underparts pale whitish-buff, breast washed darker and with a few diffuse darker streaks; eyes dark brown; bill pale whitish horn, slightly darker tip and dorsal side of upper mandible; legs flesh-pink. Distinguished from *M. cantillans* by brighter and more rufous appearance of upperparts, with less distinct streaking, and more striking tricoloured tail. Sexes alike. Juvenile has broader pale feather fringes on back and wing-coverts, heavier dark spotting on breast. VOICE. Male song a series of varied notes, including chirps, whistles and trills, similar to that of *M. cantillans* but with less repetition, given from low perch or ground as well as in aerial display; includes some mimicry of other birds, including ducks (Anatidae), bee-eaters (*Merops*), woodpeckers (Picidae) and prinias (*Prinia*), mostly in aerial display.
Habitat. Arid areas; occurs on red sands in sandy soils with scattered grasses and shrubs. Often associated with specific grasses, including *Stipagrostis uniplumis*, *Cenchrus biflorus* and *Schoenefeldia gracilis*.
Food and Feeding. Seeds and insects; forages on ground.
Breeding. Very little known. Displaying reported May-Aug, associated with summer rains in the Sahel; in Burkina Faso, singing occurred despite absence of rain, when adjacent *M. cantillans* were silent. Male song flight up to 100 m above ground, lasts for up to 35 minutes. Nest and eggs undescribed; distraction displays observed in Mauritania.
Movements. Poorly known. Probably opportunistically nomadic, moving in response to local rain events, but at least some birds make more or less regular movements S into more mesic areas in winter months.
Status and Conservation. Not globally threatened. Uncommon or rare throughout range. No documented records from E Niger and W Chad, but it may occur sporadically throughout this area. Although no specific threats identified, increasing grazing pressure in the Sahel is likely to affect this species adversely.
Bibliography. Bannerman (1953), Borrow & Demey (2001), Butler (1905), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Fishpool *et al.* (2000), Gee (1984), Giraudoux *et al.* (1988), Keith *et al.* (1992), Lynes (1924), Mackworth-Praed & Grant (1960, 1970), Portier *et al.* (2002), Salvan (1968), Sinclair & Ryan (2003), Snow & Perrins (1998).

11. Williams's Lark

Mirafra williamsi

French: Alouette de Williams **German**: Williamslerche **Spanish**: Alondra de Williams
Other common names: Williams's Bushlark, Marsabit Lark

Taxonomy. *Mirafra williamsi* Macdonald, 1956, Marsabit, Kenya.
Monotypic.
Distribution. Locally in N & C Kenya (Dida Galgalu Desert, N of Marsabit, and between Isiolo and Garba Tula).
Descriptive notes. 14 cm. Fairly small, compact, heavy-billed lark with relatively plain upperparts. Has strongly marked head, with pale supercilium and neck-collar contrasting sharply with dark, rich brown ear-coverts; crown dark-streaked rufous, upperparts rich brown with prominent paler rufous feather edges, especially on wing-coverts and flight-feathers; tail brown, outer feathers



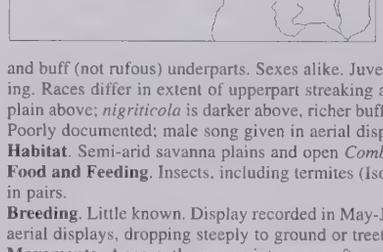
white; buffy white below, breast washed rufous and variably streaked and mottled dark brown and chestnut; eyes dark brown; bill grey-horn above, lower mandible whitish; legs pale flesh. Rarer variant ("dark morph") is almost uniform blackish-brown above. Rufous type distinguished from *M. albicauda*, *M. pulpa* and *M. cantillans* by overall more rufous appearance, especially across breast, with much less streaking above, from *Calendulauda alopex* by slightly smaller size, plainer, less rufous upperparts, appreciably heavier bill and less white in tail; dark form best told from *M. albicauda* by darker breast, heavier bill. Sexes alike. Juvenile undescribed. VOICE. Male song a series of thin, rather scratchy notes, with distinctive "tsir-ééét tsir-ééét" towards end of each series.
Habitat. The two populations are found in slightly different habitats: in N (N of Marsabit) occurs on rocky desert plains and red lava soils with scattered short grass and low shrubs; in S (Isiolo) occupies uniform areas of low *Barleria* shrubs in rocky desert. Altitudinal range 650-1300 m.
Food and Feeding. Food includes seeds and insects. Forages singly on ground, rarely perching on rocks.
Breeding. Males display before sunrise, making low, laboured display-flights. Nest and eggs undescribed.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Data-deficient. Locally common, but has small and restricted range; known from only two areas in N & C Kenya. Secretive, and easily overlooked. Nothing is known about any changes in its population size, or any potential threats to its habitat.
Bibliography. Bennun & Njoroge (1999), Collar & Stuart (1985), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Hockey (1997a), Keith *et al.* (1992), Lewis & Pomeroy (1989), Short *et al.* (1990), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stevenson & Fanshawe (2002), Turner (1997), Zimmerman *et al.* (1996).

12. Rusty Lark

Mirafra rufa

French: Alouette rousse **German**: Rostlerche **Spanish**: Alondra Rufa
Other common names: Rusty Bushlark

Taxonomy. *Mirafra rufa* Lynes, 1920, Juga Juga, 3000 feet [c. 915 m], 15 miles [c. 24 km] ENE of El Fasher, Darfur, Sudan.
Has been suggested by some authors as forming a superspecies with *M. gilletti*, but no data on molecular genetics for either species; *Calendulauda poecilosterna* (when placed in present genus) suggested as third member of same superspecies. Three subspecies recognized.
Subspecies and Distribution.
M. r. nigriticola Bates, 1932 - E Mali E to WC Niger.
M. r. rufa Lynes, 1920 - SC Chad and W Sudan.
M. r. lynesi C. H. B. Grant & Mackworth-Praed, 1933 - C Sudan.



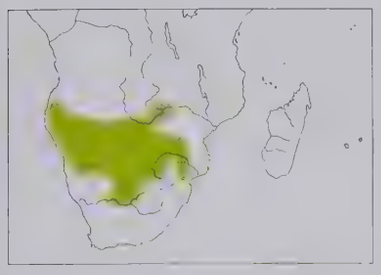
Descriptive notes. 13-15 cm. Small to medium-sized lark with narrow buff supercilium, dark-streaked rufous ear-coverts. Nominate race has crown and upperparts rufous, variably streaked black and buff; tail blackish, central pair of feathers rufous, narrow buff edges of outer feathers (visible at close range); underparts buffy, throat slightly paler, breast streaked and mottled darker brown and rufous; eyes red-brown; bill blackish-horn above, whitish lower mandible; legs grey-brown. Distinguished from other small congeners by slightly longer tail lacking white sides, from more similar *M. rufocinnamomea* by somewhat paler upperside and buff (not rufous) underparts. Sexes alike. Juvenile is paler above with more prominent streaking. Races differ in extent of upperpart streaking and intensity of plumage tones: *lynesi* is almost plain above; *nigriticola* is darker above, richer buff below, with heavier streaking on breast. VOICE. Poorly documented; male song given in aerial display, described as "pleasing".
Habitat. Semi-arid savanna plains and open *Combretum* woodland on rocky ridges.
Food and Feeding. Insects, including termites (Isoptera), and seeds. Forages on ground, singly or in pairs.
Breeding. Little known. Display recorded in May-Jul, also Sept in Chad. Male performs protracted aerial displays, dropping steeply to ground or treetop perch. Nest and eggs undescribed.
Movements. Apparently moves into areas after rain, but this possibly a reflection of its greater conspicuousness when displaying. Single record of race *nigriticola* in N Togo perhaps indicative of some larger-scale movements, but not known whether these are at all regular.
Status and Conservation. Not globally threatened. Locally common in some parts of range, but generally scarce. A poorly known species.
Bibliography. Bannerman (1953), Bates (1934), Borrow & Demey (2001), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Giraudoux *et al.* (1988), Keith *et al.* (1992), Lynes (1924), Mackworth-Praed & Grant (1960, 1970), Newby (1980), Nikolaus (1987), Salvan (1968), Sinclair & Ryan (2003).

13. Monotonous Lark

Mirafra passerina

French: Alouette monotone **German**: Sperlingslerche **Spanish**: Alondra Monótona
Other common names: Monotonous Bushlark, White-tailed Lark(!)

Taxonomy. *Mirafra passerina* Gyldenstolpe, 1926, Damaraland, Namibia.
Sometimes placed in a superspecies with *M. javanica*, *M. cantillans*, *M. albicauda* and *M. cheniana*, but validity of this grouping remains untested. Monotypic.
Distribution. S Angola E to SW Zambia and W Zimbabwe, S to C Namibia, Botswana and NC & NE South Africa.



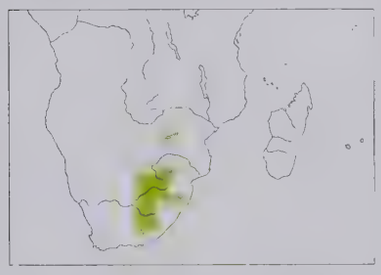
Descriptive notes. 14 cm; 21-28 g. Medium-small, compact, stout-billed lark with relatively plain, unmarked face. Has buffy supercilium barely contrasting with buffish-brown ear-coverts; buffy brown above, streaked darker brown, with rufous edges of flight-feathers forming rufous wingpanel; white outer tail feathers; throat and belly white (white throat prominent when singing), breast contrastingly buffy with a few dark brown streaks; eyes dark brown; bill dark horn above, paler below; legs pinkish. Differs from *M. cheniana* in slightly larger size, less distinct facial markings. Sexes alike. Juvenile is darker above, with buff-fringed feathers, appearing scaly, has breast more heavily spotted. Voice. Male song a short series of rapid, rather croaky notes run together, variously rendered as "for-syrup-is-sweet" or "tell-it-to-him", each phrase lasting less than 1 second, song repeated monotonously every 2-5 seconds, usually from perch on top of bush or tree, also in short display-flight.
Habitat. Favours rather arid savanna and woodland, including mopane (*Colophospermum mopane*) and acacia (*Acacia*) woodland; often in areas with sparse grass cover, but found also in denser grassland. After good rainfall, irrupts into semi-desert areas, provided that at least some shrubs present for songposts.
Food and Feeding. Insects, spiders and seeds. Feeds on ground.
Breeding. Breeds during summer rains, Oct-Mar, with peak in Jan. Probably monogamous. Advertising male sings incessantly, day and night, from elevated perch, or in short display flight, rising 15-20 m and then dropping back to perch; singing may cease during hottest part of day, but resumes if clouds cover sun; territory c. 2 ha, but as little as 0·5 ha in some areas. Nest a deep cup enclosed by well-developed domed roof, with side entrance, made from grasses, interior lined with dry grass and stems, almost invariably placed within or against a grass tuft, blades of which typically incorporated into roof. Clutch 2-4 eggs, usually 3; no information on parental duties or incubation and fledging periods.
Movements. Poorly known. Relatively few records outside breeding season, leading to speculation by some authors that it is an intra-African migrant; this, however, seems implausible, given absence of records outside known breeding range; much lower reporting rates throughout range in winter, suggesting no systematic movements take place, and it seems more likely that species is simply overlooked when not calling. Nomadic, irrupts into areas outside core range in years of above-average rainfall. Even within areas where breeding takes place regularly, pairs seldom occupy the same places in successive years; this may be linked to localized rainfall patterns.
Status and Conservation. Not globally threatened. Common to locally abundant after rains; up to 2 pairs/ha in favoured areas. Status at other times of year difficult to assess, as species is probably overlooked when not calling. Probably adversely affected by agriculture, as it avoids crop fields and orchards, but remains common in well-managed rangelands. Also, its savanna habitat is well represented in protected areas; an estimated 500,000 individuals occur in the two largest protected areas in South Africa (Kruger National Park and Kgaligadi Transfrontier Park).
Bibliography. Aspinwall (1976), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Keith *et al.* (1992), Kemp *et al.* (2001), Mackworth-Praed & Grant (1962), Maclean (1993a), Penry (1994), Sinclair & Hockey (1996), Sinclair & Ryan (2003), Tarboton (2001), Thomson (1983), Vernon (1983b).

14. Melodious Lark

Mirafra cheniana

French: Alouette mélodieuse **German**: Spottlerche **Spanish**: Alondra Melodiosa
Other common names: Latakoo Lark, Southern (Singing) Lark

Taxonomy. *Mirafra cheniana* A. Smith, 1843, no locality = Latakoo, northern South Africa.
Sometimes placed in a superspecies with *M. javanica*, *M. cantillans*, *M. albicauda* and *M. passerina*, but validity of this grouping remains to be tested. Monotypic.
Distribution. C Zimbabwe, SE Botswana and E South Africa.



Descriptive notes. 12 cm. Small, fairly compact lark with distinct pale supercilium contrasting with brown ear-coverts. Crown and upperparts are buffy brown, streaked darker brown; flight-feathers have narrow rufous edges, forming rufous panel on folded wing; white outer webs of outer tail feathers; throat white, breast buffy with variable streaking of darker brown, belly creamy buff; eyes brown; bill pale horn; legs pinkish. Distinguished from *M. passerina* by smaller size, more prominent pale supercilium, usually more buffy underparts; from *Spizocorys conirostris* by longer, more slender, horn-coloured bill, longer tail, paler belly. Sexes alike. Juvenile is darker with pale-fringed feathers above, supercilium less marked, bill paler. Voice. Male song, typically delivered in protracted aerial display but also from low perch (including termite mound), long and rambling, surprisingly loud (bird seems closer than it actually is), frequently incorporating calls of e.g. finches (Fringillidae), sunbirds (Nectariniidae), cisticolas (*Cisticola*), plovers (Charadriidae), kites (*Elanus*, *Milvus*), kestrels (*Falco*), pipits (*Anthus*) and swallows (Hirundinidae), as well as other sounds, including hyrax (Procaviidae) alarm calls; at one site six males recorded as mimicking at least 48 birds, and additional 25 species mimicked at other sites; mimetic elements interspersed among basic structure of whistles and trills, each usually repeated 2-4 times, e.g. "chuck-chuck-chuck-ick-ick-ick-trrrrrrrr-eck-eck-errr-errr-errr-chuck-chuck-chuck…"; song becomes shorter as season progresses. Also a soft alarm call, "chuck chuck chucker chuck".
Habitat. Grassland slopes; avoids wetter lowlands. Prefers more open grassland, with open spaces between tussocks, typically where grass less than 50 cm tall. In South Africa found in areas dominated by *Themeda triandra*; in Zimbabwe inhabits areas where *Eragrostis*, *Heteropogon*, *Setaria* and *Loudetia* grasses predominate.
Food and Feeding. Seeds, mostly of grasses, also some insects. Feeds on ground.
Breeding. Sept-Mar (mainly Nov-Jan) in South Africa and Jan-Mar in Zimbabwe. Probably monogamous and territorial; in favoured areas, displaying males spaced 50-100 m apart. In protracted aerial display lasting 30-40 minutes, male sings while climbing steadily from ground, then hangs almost stationary 25-50 m above territory, returning to ground in a series of vertical steps, often singing during each step; sings and displays mostly in morning, on calm days. Nest a domed structure with side entrance, built from coarse grasses, lined with finer grass leaves, placed in shallow depression at base of a grass tuft, or between two tufts, and with distinctive "apron" of grass stems outside entrance; domed roof rather more peaked than in nests of congeners. Clutch 2-4 eggs (mean 2·8); no information on parental duties or incubation and fledging periods.
Movements. Apparently largely resident, but seasonal fluctuations in numbers may indicate some movement; undertakes local movements in response to dry-season fires. Lack of geographical variation across its fragmented range has been interpreted as indicating either that there is sufficient movement to prevent accumulation of regional differences, or that species' range has contracted relatively recently.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted to well-managed grasslands, and hence patchily distributed, with estimated maximum range of 110,000 km². Range has contracted in South Africa in recent years; large areas have been transformed for crop production, as well as by development of urban areas around Johannesburg and Pretoria, and much of the remaining grassland has been degraded by overgrazing; absent from heavily grazed areas. Small, isolated population in Zimbabwe, where currently known from only two sites, both farms listed for resettlement; some habitat in Zimbabwe has been lost as a result of bush encroachment. Known from very few localities in Botswana. This species may also be threatened by climate change, because its preferred grassland habitat requires a specific rainfall regime to prevent it from becoming too dry and invaded by shrubs, or too wet, which is likely to make the grassland too dense.
Bibliography. Barnes (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), English (1995), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Hosken (1990), Hustler & Frost (2002), Keith *et al.* (1992), Mackworth-Praed & Grant (1962), Maclean (1993a), Masterson & Parkes (1993), Robertson (1989), Sinclair & Hockey (1996), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Tarboton (2001), Vernon (1971).

15. Friedmann's Lark

Mirafra pulpa

French: Alouette de Friedmann **German**: Friedmannlerche **Spanish**: Alondra de Friedmann
Other common names: Friedmann's Bushlark, Sagon Lark; Nyiro/Rufous Lark/Bushlark ("*M. candida*")

Taxonomy. *Mirafra pulpa* Friedmann, 1930, Sagan River, Shoa Province, Ethiopia.
Birds from R Nyiro, in NE Kenya, described as species "*M. candida*", but type specimen appears indistinguishable from present species. Monotypic.
Distribution. S Ethiopia, N, C & SE Kenya and NE Tanzania.



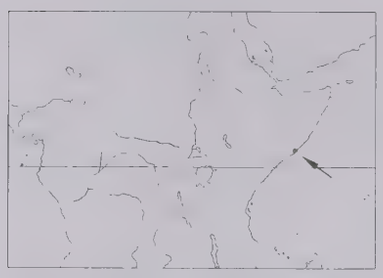
Descriptive notes. 13-14 cm; 22 g. Rather small, compact lark. Has pale supercilium, dark-streaked rufous crown; upperparts rufous-looking, with rich rufous and buff edges of feathers, rufous-brown centres of greater coverts, tertials and central tail feathers; rufous wingpanel, white outer tail; white throat (prominent when singing), warm buff below, breast streaked dark brownish; eyes brown; bill dark horn above, paler below, often with pinkish wash; legs dull flesh. Distinguished from extremely similar *M. cantillans* by more rufous appearance above (at close range feather centres rufous-brown, not blackish-brown), heavier streaking on especially nape and mantle, warmer buff underparts, less prominent supercilium, appreciably heavier bill. Sexes alike. Juvenile has broad pale fringes above, breast with diffuse spots rather than streaks; differs from juvenile *M. cantillans* in having more rufous on wings, nape and back. Voice. Song diagnostic, rather stereotyped "hooéééooo" whistle, repeated every 1-2 seconds, quite unlike song of *M. cantillans* and other small larks in its range; given from elevated perch, such as low bush, or in low display-flight.
Habitat. Prefers dense grassland with scattered bushes; recorded also in short, sparse grassland.
Food and Feeding. Grass seeds, also small grasshoppers (Acrididae), beetles (Coleoptera) and other insects. Forages on ground.
Breeding. Little known. Displaying males recorded Nov-Jan and Apr-May; birds in early Aug were in active moult. Low song flight by male, circling 5-10 m above ground, duration usually less than 1 minute; when singing from perch, leans forward with crown feathers raised, throat feathers puffed out; sings and displays throughout day and on moonlit nights; reputed wing-clapping in Ethiopia requires confirmation. Nest and eggs undescribed.
Movements. Assumed to be nomadic or partially migratory, in association with rains. In Kenya, typically recorded in Tsavo only during rainy season, but unclear whether this is because species is much easier to locate when males are displaying; at Ngulia Lodge, two individuals recorded at night in Dec, during trapping of Palearctic migrants.
Status and Conservation. Not globally threatened. Data-deficient. Most records are from Tsavo National Park, in SE Kenya, and adjacent Mkomazi Game Reserve, in NE Tanzania. Is apparently extremely rare, although group of 150 observed in Tsavo West National Park. Uncertain whether great preponderance of records from protected areas is merely a result of greater numbers of observers there, or reflects particular requirements of species that are lacking outside reserves. No specific threats identified, but its preferred habitat of dense grassland is probably prone to overgrazing and to transformation for agriculture.
Bibliography. Ash (1992b), Bennun & Njoroge (1999), Collar & Stuart (1985), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Lack (1977, 1997), Lewis & Pomeroy (1989), Pearson *et al.* (1992), Short *et al.* (1990), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

16. Ash's Lark

Mirafra ashi

French: Alouette d'Ash **German**: Ashlerche **Spanish**: Alondra de Ash
Other common names: Ash's Bushlark

Taxonomy. *Mirafra ashi* Colston, 1982, Uarsciek (Uarshek), south Somalia.
Monotypic.
Distribution. E coastal plain of Somalia in area of Uarshek (80 km N of Mogadishu).



Descriptive notes. 17 cm; 31-42 g. Medium-sized to large lark, appearing grey-brown above with only faint wash of rufous. Has narrow, indistinct pale supercilium; in fresh plumage upperparts scaly-looking, with pale fringes and dark subterminal bars; primaries and outer secondaries have rufous margins, forming panel on closed wing; tertials finely barred; tail greyish, rectrices with pale buff margins separated from rest of feather by narrow blackish band, outer tail feathers edged white; underparts whitish, breast and flanks washed pinkish-buff, lower throat and breast faintly streaked rufous-brown, larger and darker streaks at side of breast; eyes dark brown; bill dark grey, paler blue-grey below; legs creamy. Differs from *M. gilletti* in larger size, longer bill and legs, and tail pattern; from *M. somalica* in smaller size, appreciably shorter bill, darker, less rufous and more streaked upperparts, smaller and narrower supercilium not extending far behind eye, narrower white on outer tail. Sexes alike. Juvenile is more heavily streaked above, with broad buffy edges of feathers, slightly richer buff below. Voice. Undescribed; reported as often singing from tops of small bushes.
Habitat. Short, open grassland in stabilized dune systems with a few scattered bushes and fossil coral outcrops.
Food and Feeding. Diet unknown. Runs across open ground between grass tufts; frequently perches on tops of tufts.
Breeding. A female had enlarged ovaries in Jul, but was also in active wing and tail moult. No other information; nest and eggs undescribed.
Movements. Unknown; presumably resident.
Status and Conservation. ENDANGERED. Restricted-range species: present in Central Somali Coast EBA. Known to occur only in area just N of Uarshek, where it was reported as locally common in 1980s; almost certainly does not occur farther S, but possibly extends N along coastal plain. Current total range estimated as being 1730 km², with global population of 2500-10,000 individuals and possibly decreasing, but these figures extremely speculative. No recent surveys, but it may be threatened within its tiny range, in which no protected areas exist, by habitat loss and degradation linked to new coastal developments. Conservation targets include fieldwork aimed at determing its total range and status, as well as identifying threats to its habitat. Moreover, this is an extremely poorly known species, with virtually no information on its appearance or behaviour in the field, and no information on its ecology.
Bibliography. Ash & Miskell (1998), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Colston (1982b), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Hockey (1997a), Keith *et al.* (1992), Sinclair & Ryan (2003), Stattersfield & Capper (2000).

17. Somali Long-billed Lark

Mirafra somalica

French: Alouette de Somalie **German**: Somaliriesenlerche **Spanish**: Alondra Somalí
Other common names: (Red) Somali Lark, Somali Long-billed Bushlark

Taxonomy. *Certhilauda somalica* Witherby, 1903, Dibbit, Somalia.
Possibly forms a superspecies with *M. hypermetra* and *M. africana*. Suggested that it is allied to *Certhilauda* on basis of structure and undomed nest, but these could be result of convergence; has also been proposed, on basis of limited evidence from displays, that race *rochei* may be a distinct species, with only nominate race belonging in *Certhilauda*. Both races retained in present genus pending sequencing of genetic material and further study. Two subspecies recognized.
Subspecies and Distribution.
M. s. somalica (Witherby, 1903) - N & NE Somalia (S to c. 3° N); probably also extreme E Ethiopia.
M. s. rochei Colston, 1982 - coast of C Somalia (2-3° N).



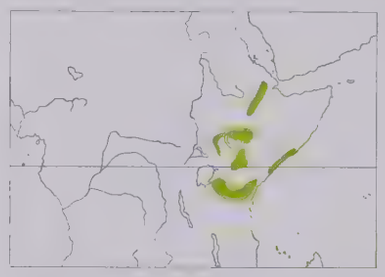
Descriptive notes. 19-22 cm; 44-50 g. Large reddish lark with long, slender bill; reminiscent of *Certhilauda*, but with rufous edges of flight-feathers. Nominate race has rufous face with darker streaks on ear-coverts, fairly prominent whitish supercilium; crown and upperparts warm rufous-brown, faint white streaks on nape and neck, back feathers with buff on inner edges, rump feathers white-tipped with dark subterminal bar; upperwing-coverts rufous with whitish margins; tertials rufous, edged white, with narrow dark subterminal band; flight-feathers edged rufous; tail dark grey-brown, central pair of feathers rufous-brown with darker central streak and buff edges, white outer web of outer feathers; throat whitish; rest of underparts creamy buff, variable rufous-brown streaking on breast; eyes brown; bill dark horn, base of lower mandible paler; legs whitish or creamy brown. Distinguished from *M. africana* of race *sharpei* by slightly larger size, longer and thinner bill, somewhat paler rufous upperparts, white outer tail, longer and less curved hind claw; from *M. ashi* mainly by larger size, longer bill, paler, more rufous and less streaked upperparts, stronger supercilium. Sexes alike, female on average smaller. Juvenile undescribed. Race *rochei* is darker and more heavily streaked than nominate. Voice. Undescribed; implication that nominate race has a long, clear whistle, similar to that of S African *Certhilauda*; *rochei* reported as singing from tops of bushes in morning and evening.
Habitat. Open grassland, often with open patches of red sand; may occur where there are occasional small shrubs or even a few small trees.
Food and Feeding. Diet unknown. Feeds on ground. Runs rapidly when disturbed, often jumping up on to grass tufts to gain better vantage; when flushed, seldom flies more than 50 m.
Breeding. Little known. Breeding recorded in Jun in N and Sept in S. Apparently solitary or in pairs throughout year. Race *rochei* reported as having short, wing-snapping display-flight up to 5 m above ground. Only one nest described, a shallow scrape in ground next to a grass tuft, virtually unlined but with "apron" of plucked grass around edge. Clutch 3-4 eggs; nothing known about parental duties or incubation and fledging periods.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Reported to be fairly common. Poorly known species; fieldwork required in order to determine its true status, as well as its ecology and biology.
Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Colston (1982b), Herremans *et al.* (1994), Keith *et al.* (1992), Mackworth-Praed & Grant (1960), White (1956).

18. Red-winged Lark

Mirafra hypermetra

French: Alouette polyglotte **German**: Riesenlerche **Spanish**: Alondra Alirroja
Other common names: Red-winged Bushlark

Taxonomy. *Spilocorydon hypermetrus* Reichenow, 1879, Kibaradja, Tana River, Kenya.
May form a superspecies with *M. africana*, possibly also including *M. somalica*. Sometimes considered conspecific with former, but the two are morphologically and vocally distinct, with no intermediate forms where their ranges meet in Kenya and N Tanzania. Four subspecies recognized.
Subspecies and Distribution.
M. h. gallarum Hartert, 1907 - Ethiopia (Rift Valley S from Awash).
M. h. kathangorensis Cave, 1940 - extreme SE Sudan.
M. h. kidepoensis Macdonald, 1940 - extreme S Sudan and NE Uganda.
M. h. hypermetra (Reichenow, 1879) - Kenya, S Somalia and NE Tanzania.



Descriptive notes. 21-23 cm; 44-68 g. Large, robust lark with fairly long, stout bill and long tail; sometimes shows small crest when singing. Nominate race has prominent buffy supercilium; crown and upperparts rufous-brown (variable, some individuals greyer) and fairly heavily dark-streaked; rufous flight-feathers form rufous panel on folded wing (and conspicuous in flight), although secondaries are browner with paler buff edges; tail feathers brown with buff outer edges (broader in outer tail); underparts variable, rufous to buff, breast with black central steraking passing to dark rufous-brown streaking which coalesces to form dark pectoral patch on breast side (patch often inconspicuous when plumage worn); eyes brown; bill dark greyish-horn above, paler and more pink below; legs pale pink to greyish-white, sometimes brownish-flesh. Distinguished from closely similar *M. africana* by larger size, noticeably longer tail, on average longer bill, and blackish pectoral patches. Sexes alike. Juvenile is darker with pale feather fringes above, has more diffuse spots on breast, reduced dark pectoral patches. Race *kidepoensis* is slightly smaller than nominate, also browner and more chestnut above; *kathangorensis* resembles previous but darker; *gallarum* is paler and greyer, with pectoral patches small or absent. Voice. Song loud, far-carrying whistles, in series 1-15 seconds long (mean 3 seconds), same motif seldom repeated more than five times before switching to new variation, similar to song of *M. africana* but longer and more variable; also protracted song lasting several minutes, including regular mimicry of other birds' calls, one individual recorded as mimicking in 15-minute period 20 species from 16 families, including other larks, cisticolas (*Cisticola*), swallows (Hirundinidae), starlings (Sturnidae), bustards (Otididae), lapwings (*Vanellus*), nightjars (Caprimulgidae), mousebirds (*Colius*), bee-eaters (*Merops*) and hornbills (Bucerotidae), with a single 12-second song containing mimicry of five other species; sings mostly from elevated perch, also from ground and in short display-flight.
Habitat. Savanna and grassland with scattered trees, to 1350 m. Typically in drier habitats and at lower elevations than *M. africana* where their ranges meet; perches on bushes and small trees more often than does that species; the two are not known to co-occur.
Food and Feeding. Insects, including termites (Isoptera), also some seeds. Feeds on ground; occasionally jumps into air in pursuit of flying insects.
Breeding. Breeds in Nov-Jan in E Africa and in Jun in Somalia. Monogamous and territorial, singing throughout year. Male has short, laboured song flight. Nest in shallow scrape on ground at base of a grass tuft, lined with cup of grass and rootlets, these woven into overhanging vegetation to form domed roof. Clutch 1-4 eggs; no information on parental duties or incubation and fledging periods.
Movements. Apparently resident, but may undertake local movements. At Ngulia Lodge, in Kenya, one flew to lights at night in Dec with other nocturnal migrants.
Status and Conservation. Not globally threatened. Locally common in suitable habitat within relatively restricted range.
Bibliography. Ash & Miskell (1998), Bennun & Njoroge (1999), Byaruhanga *et al.* (2001), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1978), Fishpool & Evans (2001), Keith *et al.* (1992), Lack (1985), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Nikolaus (1987), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), White (1956, 1960a), Zimmerman *et al.* (1996).

PLATE 54 ➤



PLATE 54

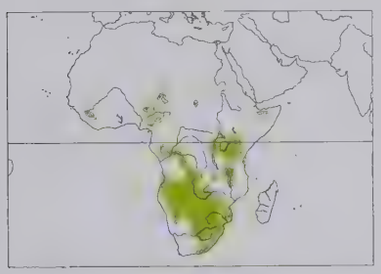
inches 4
cm 10

19. Rufous-naped Lark

Mirafra africana

French: Alouette à nuque rousse **German**: Rotnackenlerche **Spanish**: Alondra Nuquirrufa
Other common names: (Red) Somali Lark, Somali Bushlark (*sharpii*)

Taxonomy. *Mirafra africana* A. Smith, 1836, Algoa Bay, Eastern Cape, South Africa.
May form a superspecies with *M. hypermetra*, possibly also including *M. somalica*. Sometimes considered conspecific with former, but the two are morphologically and vocally distinct, with no intermediate forms where their ranges meet in Kenya and N Tanzania. Geographical variation extreme, and future studies likely to reveal that several races, especially among isolated populations in W, C & NE Africa, should be treated as separate species; likely candidates for future splits include *malbranti*, which has a quite distinct aerial display and may be more closely related to *M. angolensis*, and *sharpii*, which has distinctive plumage; conversely, differences among many contiguous races are broadly clinal, and further study may reveal that several taxa are untenable; full review required. Other described races, all considered insufficiently distinct, include *anchietae* (Huíla, in SW Angola), *irwini* (Cuando Cubango, in SE Angola), *zuluensis* (Maputa, in NE KwaZulu-Natal) and *rostrata* (coastal SE South Africa). Twenty-three subspecies tentatively recognized.
Subspecies and Distribution.
M. a. henrici Bates, 1930 - SE Guinea, N Sierra Leone, N Liberia and extreme W Ivory Coast.
M. a. batesi Bannerman, 1923 - SE Niger, W Chad and C (possibly also NE) Nigeria.
M. a. bamendae Serle, 1959 - W Cameroon, possibly also adjacent E Nigeria.
M. a. stresemanni Bannerman, 1923 - C Cameroon (Adamawa Plateau).
M. a. kurrae Lynes, 1923 - W Sudan.
M. a. sharpii Elliot, 1897 - NW Somalia.
M. a. malbranti Chapin, 1946 - E Gabon, SC PRCongo and adjacent SW DRCongo.
M. a. ruwenzoria Kinnear, 1921 - E DRCongo and SW Uganda.
M. a. tropicalis Hartert, 1900 - E Uganda, SW Kenya and NW Tanzania.
M. a. athi Hartert, 1900 - C Kenya and N Tanzania.
M. a. harterti Neumann, 1908 - S Kenya.
M. a. occidentalis (Hartlaub, 1857) - W Angola.
M. a. kabalii C. M. N. White, 1943 - E Angola (Lunda Sul and N Moxico) and NW Zambia (Balovale).
M. a. gomesi C. M. N. White, 1944 - E Angola (E Moxico) and W Zambia (Kabompo).
M. a. chapini C. H. B. Grant & Mackworth-Praed, 1939 - SE DRCongo and NW Zambia.
M. a. nyikae Benson, 1939 - NE Zambia, adjacent SW Tanzania and N Malawi.
M. a. nigrescens Reichenow, 1900 - S Tanzania (Kitulu Plateau).
M. a. isolata Clancey, 1956 - SE Malawi.
M. a. pallida Sharpe, 1902 - S Angola (SW Cuando Cubango) and N Namibia.
M. a. ghansiensis (Roberts, 1932) - E Namibia and W Botswana.
M. a. grisescens Sharpe, 1902 - N Botswana, W Zambia and NW Zimbabwe.
M. a. transvaalensis Hartert, 1900 - S Tanzania and Mozambique S to N South Africa.
M. a. africana A. Smith, 1836 - SE South Africa.



Descriptive notes. 16-20 cm; male 40-55 g, female 33-49 g. Fairly large, robust lark with short erectile crest, rufous flight-feathers forming prominent rufous panel on folded wing (and conspicuous in flight); bill relatively stout for a primarily insectivorous lark. Nominate race has buffish lores and supercilium, with browner ear-coverts; crown dark brown with buff and rufous feather edges (much rufous on hindcrown and nape), hindneck paler; upperparts rufous-brown to brown, streaked, wing-coverts edged rufous and buff; flight-feathers dark brown with rufous at bases and on outer webs; tail dark brown, outer feathers with buff outer webs; throat whitish, rest of underparts rufous to rufous-buff, paler on flanks, breast with dark spots; eyes brown; most of maxilla dark horn to dark grey, with rest of bill paler pinkish, sometimes darker towards tip; legs flesh-pink to straw-coloured. Differs from e.g. *M. angolensis*, *M. apiata*, *M. fasciolata* and *M. rufocinnamomea* in larger size, more robust build, possession of crest; from *M. hypermetra* in being slightly smaller and more compact, with shorter tail, no blackish patch on neck side. Sexes alike. Juvenile typically has darker upperparts with pale feather fringes, larger and more diffuse spots on breast sometimes forming darker pectoral patch. Races vary enormously in plumage colour, and rufous nape is absent or barely visible in many: *transvaalensis* is paler and less streaked above than nominate, paler below; *grisescens* is paler and greyer than previous; *ghansiensis* has pale pinkish-sandy upperparts; *pallida* has upperparts paler, more yellow-brown, variably streaked; *occidentalis* is darker than last, more grey-brown; *chapini* is dark and heavily streaked blackish above, bill larger; *gomesi* is greyer than previous, streaking well defined; *kabalii* is paler, more blue-grey, and less streaked above, bill larger; *malbranti* is remarkably plain, light reddish-brown very little dark streaking above, plain ochre below; *nigrescens* is very large, with longer legs, shorter tail, dark red-brown above with heavy black scaling rather than streaks, dark buff below with large black drop-shaped breast streaks extending to flanks; *nyikae* closely resembles previous, possibly not quite so dark and less extensively marked below; *isolata* is greyish above, tawny below; *tropicalis* is distinctive, has rich orange-red upperparts well streaked blackish, rufous-orange underparts; *ruwenzoria* is greyer and more heavily streaked above than previous; *athi* has grey to buff-grey upperparts streaked blackish, variable, greyest in SE, browner in W, crown rufous in SW; *harterti* resembles previous, but upperpart feathers edged deep orange; *sharpii* is bright rufous-chestnut above with buff-edged feathers, creamy below with chestnut breast streaks; *kurrae* has upperparts vinaceous rufous with heavy black streaking, throat and underparts deep tawny; *stresemanni* is small and dark, has crown and upperparts rich rufous, only very few black streaks, deep cinnamon below; *bamendae* differs from last in heavier streaking above, smaller size; *batesi* is more sandy-coloured and heavily streaked above; *henrici* is also small, very dark and well streaked blackish above, with unmarked crown, belly buffish. Voice. Male (of most races) has short (0·5-0·7 seconds), simple song, "tlee tleeou", "tud tiddle-ooo" or "too too too too", repeated every 2-20 seconds, typically switches call type after 20 or more repetitions, repertoire size not known; song often immediately preceded by wing-rattling; occasionally more complex song, which may include mimicry of other species (but this is rare, compared with *M. hypermetra*), during short aerial display. Peculiarly, in an area of Kenya with few of present species, one or more individuals substituted song of Abyssinian Nightjar (*Caprimulgus poliocephalus*) for the usual one, presumably because the young inadvertently learned incorrect song during their sensitive period. Alarm call "tlew-it" or "twee ki-ree", often given when intruders approach nest.
Habitat. Wide range of grassy habitats from sea-level to 3000 m, including savanna and open woodland, grassland, grassy fynbos, fallow lands and bare areas adjacent to fields. Avoids very dense grassland, preferring areas where at least some bare patches present. In C Africa, prefers dry plains where *M. angolensis* is absent.
Food and Feeding. Insects, including grasshoppers (Acrididae), caterpillars, beetles (Coleoptera), termites (Isoptera), mantids, dipteran larvae, also other invertebrates, including spiders, millipedes (Diplopoda) and earthworms (Oligochaeta); also grass seeds. Forages primarily on the ground, gleaning insects from vegetation or from ground surface; sometimes scratches the earth with its feet or bill. Also searches for food among dung, or in areas where large mammals concentrate. Stands on termite mounds, eating all termites that emerge. Occasionally hawks termite alates but, owing to its laboured flight, seldom successfully.
Breeding. Season mostly Nov-Feb and Apr-Aug; mainly Oct-Feb in S Africa. Monogamous and territorial. Male sings primarily during early breeding season, from low perch, with head thrown backwards 30°-40°; immediately prior to uttering song, often rattles wings, sometimes while jumping a few centimetres into air (this appears to be precursor to wing-clapping display in *M. rufocinnamomea*, *M. apiata*, *M. fasciolata* and *M. collaris*); race *malbranti* has very distinctive display, rising vertically from ground to c. 10 m, where rattles wings and gives 3-note whistle before parachuting back to earth with wings raised and legs outstretched (similar to one of the displays of *M. angolensis*). Nest in shallow scrape, usually at base of a grass tuft or between two tufts, occasionally at base of small bush, lined with grass and other vegetation, this usually woven into overhanging vegetation to form domed roof, thickness of lining and roof varies greatly; in nests with complete roof, access is via a side entrance. Clutch 2-3 eggs, rarely 4 (mean 2·4); incubation apparently only by female, which, when disturbed, is reluctant to return to nest until male signals that it is safe, by calling (often during brief vertical flight); incubation period unknown; chicks brooded by female, but fed by both parents, female bringing more food than male; when disturbed at nest, parents usually creep away mouse-like through grass; chicks leave nest 10-12 days after hatching, before able to fly.
Movements. Resident. Pairs remain on territories and males sing throughout year.
Status and Conservation. Not globally threatened. Generally common; widespread in S, becoming more patchy and localized farther N. Commonest and most widespread lark in E Africa; highly fragmented distribution in W Africa, where local and uncommon to common. Has undoubtedly suffered habitat loss caused by crop-farming; on the other hand, may have benefited from ranching, which tends to reduce grass cover, making rangelands more suitable for this species.
Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Aspinwall (1979a), Bannerman (1953), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Byaruhanga *et al.* (2001), Chapin (1953), Clancey (1956a, 1958a, 1964b), Dean (2000), Dowsett (1972b), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1978), Elgood *et al.* (1994), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Horne & Short (1998), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1962, 1970), Maclean (1993a), Penry (1994), Short *et al.* (1990), van Someren (1956), Stevenson & Fanshawe (2002), Tarboton (2001), Took (1961), Vernon (1973), White (1956, 1960a), Zimmerman *et al.* (1996).

20. Angola Lark

Mirafra angolensis

French: Alouette d'Angola **German**: Angolalerche **Spanish**: Alondra Angoleña
Other common names: Angola Bushlark

Taxonomy. *Mirafra angolensis* Bocage, 1880, Caconda, Benguela, Angola.
Bears close resemblance to *M. africana*, but probably most closely related to the "*M. apiata* complex". Races poorly differentiated; further research may lead to one or more being subsumed. Racial affiliation of birds recently observed in SW Tanzania uncertain, tentatively placed in *marungensis*. Described race *minyanyae* (from NW Zambia) synonymized with *antonii*; birds from S part of Angola (Cuando Cubango) described as race *niethammeri*, but possibly referable to *M. fasciolata*. Three subspecies recognized.
Subspecies and Distribution.
M. a. angolensis Bocage, 1880 - W & C Angola.
M. a. antonii B. P. Hall, 1958 - E Angola, S DRCongo and NW Zambia.
M. a. marungensis B. P. Hall, 1958 - SE DRCongo (Marungu Plateau) and SW Tanzania (near Mumba).



Descriptive notes. 16-17 cm; male 35-42 g, female 30-37 g. Medium-sized, rather dark lark with fairly long, heavy bill. Has buffish lores and indistinct supercilium, dark-streaked brown-buff ear-coverts and neck; crown and upperparts dark reddish-brown, back and wing-coverts with solid blackish-brown centres (not barred or chevroned as in *M. rufocinnamomea*), tertials strongly barred, recalling *M. apiata*. flight-feathers dark brown, edged rufous; tail dark brown, outer rectrices white; underparts buff, with deeper pinkish-buff breast and flanks, breast with well-defined thin streaks; eyes brown; bill dark horn, paler base of lower mandible; legs flesh-brown. Distinguished from *M. rufocinnamomea* by larger size, longer bill, back and wing-coverts with solid dark centres (not barred or chevroned), paler underparts with narrower and more clearly defined breast streaks. Sexes alike. Juvenile has pale-edged feathers above, breast streaks more diffuse and rounded. Races differ in plumage tone, darker and greyer in C of range, more rufous in W & E; *antonii* is darker and greyer than nominate, heavier streaks below; *marungensis* is richer rufous above, more rufous with stronger streaks below. Voice. Male song a series of distinctive, buzzing trills, characteristically varying in pitch, "zi-zi-zi-zi-zi-zu-zu-zu-zu-zi-zi-zi-zi-zi-zu-zu-zu-zu-zu", lasting c. 5 seconds, typically given in aerial display, some-

On following pages: 21. Flappet Lark (*Mirafra rufocinnamomea*); 22. Cape Clapper Lark (*Mirafra apiata*); 23. Eastern Clapper Lark (*Mirafra fasciolata*); 24. Collared Lark (*Mirafra collaris*); 25. Gillett's Lark (*Mirafra gilletti*); 26. Degodi Lark (*Mirafra degodiensis*).

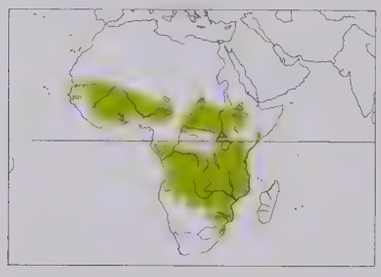
times from ground; also calls "trrp trrp t'tiiiiii tuu" from a termite (Isoptera) mound, followed by ascent with wing-rattling.
Habitat. Montane grassland, usually in damp valleys, in much of range (W Angola, SE DRCongo, SW Tanzania). In C parts (race *antonii*) occurs in dambos and on extensive grassy plains, usually in fairly damp areas, but also in drier sites where *M. africana* is absent. In Zambia, nested in area of short, recently burnt grassland adjacent to a seasonal floodplain on black-cotton soils in area with abundant small termite mounds. Appears to avoid areas where *M. africana* occurs.
Food and Feeding. Insects, including beetles (Coleoptera) and grasshoppers (Acrididae), and seeds. Feeds on ground.
Breeding. Little known. Nest found in Oct; display observed mostly in Jul-Oct, but birds with enlarged gonads in Sept-Jan. Male has short aerial display, rising steeply 25 m into air while singing, then parachuting back to earth; also calls from termite mound, then rises steeply c. 5 m into air, briefly rattling wings at apex of flight. Only one nest found, in shallow depression in ground, thickly lined with grass and rootlets, thinly domed with grass stems woven into the sheltering grass tuft, nest rim decorated with "chopped" rootlets; contained 3 eggs, incubated by female. No other information on parental duties or incubation and fledging periods.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Poorly known species, locally common but apparently rather patchily distributed. Some of its habitat may have been lost to agriculture, but most of its range remains little affected by human activities. Only recently observed in SW Tanzania; no specimens obtained, and further work required in order to determine racial identity of birds involved.
Bibliography. Aspinwall (1979a), Benson *et al.* (1971), Colebrook-Robjent (1988), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Mackworth-Praed & Grant (1962, 1970), Moyer & Sikombe (1992), Moyer & Stjernstedt (1986), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), White (1956).

21. Flappet Lark

Mirafra rufocinnamomea

French: Alouette bourdonnante **Spanish**: Alondra Aplaudidora Canela
German: Baumklapperlerche
Other common names: Cinnamon Bushlark; Buckley's Lark (*buckleyi*)

Taxonomy. *Megalophonus rufo-cinnamomeus* Salvadori, 1865, north Ethiopia.
Closely related to the "*M. apiata* complex", although it overlaps with *M. fasciolata* in N Namibia and N Botswana. Differences among many contiguous races broadly clinal; further study may reveal that several taxa are untenable. Birds from S Tanzania S to C Mozambique named as race *zombae*, but indistinguishable from *fischeri*. Fifteen subspecies recognized.
Subspecies and Distribution.
M. r. buckleyi (Shelley, 1873) - S Mauritania and Senegal E to N Cameroon.
M. r. serlei C. M. N. White, 1960 - SE Nigeria.
M. r. tigrina Oustalet, 1892 - E Cameroon, S Central African Republic and N DRCongo.
M. r. furensis Lynes, 1923 - WC Sudan.
M. r. sobatensis Lynes, 1914 - C Sudan.
M. r. rufocinnamomea (Salvadori, 1865) - N & C Ethiopia.
M. r. omoensis Neumann, 1928 - SW Ethiopia.
M. r. torrida Shelley, 1882 - SE Sudan and S Ethiopia S to N Uganda, C Kenya and N & C Tanzania.
M. r. kawirondensis van Someren, 1921 - E DRCongo, S Uganda and W Kenya.
M. r. schoutedeni C. M. N. White, 1956 - SW Central African Republic, and Gabon E to W DRCongo and S to NW Angola.
M. r. fischeri (Reichenow, 1878) - Angola (except NW) and S DRCongo E to E & S Tanzania, E Kenya and S Somalia, S to N Zambia, Malawi and N Mozambique.
M. r. lwenarum C. M. N. White, 1945 - NW Zambia (Balovale).
M. r. mababiensis (Roberts, 1932) - SE Angola, W Zambia, N Namibia and N Botswana.
M. r. smithersi C. M. N. White, 1956 - SW Zambia, NE Botswana, Zimbabwe and N South Africa.
M. r. pintoi C. M. N. White, 1956 - S Mozambique, NE South Africa and Swaziland.



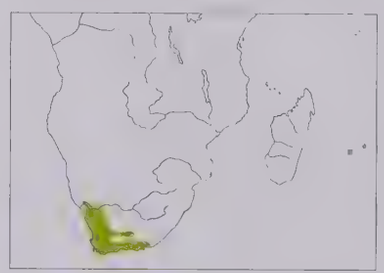
Descriptive notes. 14-15 cm; 21-32 g. Fairly small, dark lark with indistinct buff supercilium, distinctive wing-clapping display-flight. Nominate race is rufous-red above, heavily patterned with black; flight-feathers with rufous edges; outer rectrices and outer webs of adjacent pair buffy rufous; white throat, rest of underparts rufous, darker and dark-spotted on breast; eyes dark brown; bill dark horny grey above, with much paler and pinker lower mandible; legs flesh-pink. Distinguished from *M. africana* mainly by much smaller size. Sexes alike, female on average slightly smaller. Juvenile has more barred upperparts with feathers pale-tipped. Races vary markedly in plumage coloration, notably ground colour and extent of dark streaking of upperparts, and intensity of colour of underparts: *buckleyi* is dull rufous to cinnamon-brown with black streaks above, creamy buff to orange-buff below; *serlei* is deeper red above and below than last; *tigrina* is less reddish above, heavily marked with black; *furensis* has yellowish-tinged upperparts with reduced black; *sobatensis* is blackish with light buff edgings above, looks scaly; *omoensis* resembles nominate but with heavier black markings above; *torrida* is darker than previous; *kawirondensis* has blackish upperparts with grey-brown edgings; *fischeri* is dark red-brown above, variably patterned with black; *schoutedeni* is paler and browner, and less marked; *lwenarum* is rather pale, pinkish-tinged; *mababiensis* is greyish above; *smithersi* has rather pale brick-red upperparts only lightly marked; *pintoi* is dark with extensive blackish markings above, darker below, especially breast. Voice. Normal song almost entirely replaced by wing-clapping aerial display; occasionally utters thin, wispy song of 4-6 notes during display-flight, or calls "tueee tuee" from ground or low bush.
Habitat. Open woodland, savanna, scrubland, and grassy dambos in closed-canopy woodland, usually in mesic areas. Density typically greater in lightly wooded habitats than in open ones.
Food and Feeding. Mostly insects, including termites (Isoptera), caterpillars, beetles (Coleoptera), grasshoppers (Acrididae) and mantids; also a few grass seeds. In examination of contents of nine stomachs from DRCongo, only one contained seeds. Forages on the ground, seldom digging for food.
Breeding. Season May-Oct in W Africa, May-Aug and Nov-Dec in E Africa, and Sept-Mar in C & S Africa. Apparently monogamous. Male displays sporadically throughout year, mostly during breeding season, circles high over territory, produces usually 2-3 bursts of rapid, machine-gun-like clapping by hitting wings together beneath body (causing bird to rise 1-2 m), repeated every 3-10 seconds; wingbeat frequency more than doubles, from 10-11 Hz to 24 Hz, during clapping; structure of each "song" shares many of characteristics of vocal displays, including individual variation and regional "dialects" which are constant between years. Nest built in shallow scrape at base of a grass tuft or bush, often in rocky area, lined with grass and rootlets, usually domed and with side entrance, sometimes only a partial roof, at other times quite exposed and with little roof at all. Clutch 2-3 eggs, rarely 4 (mean 2·2); incubation period unknown; at one nest found just before hatching, male hovered nearby, wing-clapping in brief bursts, until intruder left, whereupon female crept cautiously back to nest; chicks leave nest 11 days after hatching, before able to fly.
Movements. Resident. Pairs remain on territories throughout year.
Status and Conservation. Not globally threatened. Locally common throughout much of its wide range. Suitable habitat has undoubtedly been lost to agriculture, because the species avoids fields and pastures; nevertheless, large numbers are protected in the many large savanna reserves in its range. Numbers were found to be higher close to stations baited for control of tsetse fly (*Glossina*) than at other monitored sites nearby, but this probably the result of creation of artificial clearings around the bait stations.
Bibliography. Bannerman (1953), Benson & Benson (1977), Benson *et al.* (1971), Bertram (1977), Borrow & Demey (2001), Byaruhanga *et al.* (2001), Chapin (1953), Cheke & Walsh (1996), Clancey (1964b), De Garine-Wichatitsky *et al.* (2001), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Ginn *et al.* (1989), Grimes (1987), Harrison *et al.* (1997), Irwin (1958), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1962, 1970), Maclean (1993a), Nikolaus (1987), Norberg (1991), Payne (1973, 1978, 1981), Penry (1994), Seibt (1975), Short *et al.* (1990), Sinclair & Hockey (1996), van Someren (1956), Stevenson & Fanshawe (2002), Tarboton (2001), Wickler (1967), Zimmerman *et al.* (1996).

22. Cape Clapper Lark

Mirafra apiata

French: Alouette bateleuse **Spanish**: Alondra Aplaudidora de El Cabo
German: Grasklapperlerche
Other common names: Bar-tailed Lark(!); Agulhas Clapper Lark (*marjoriae*)

Taxonomy. *Alauda apiata* Vieillot, 1816, Swartland = Malmesbury, Western Cape, South Africa.
In the past, has usually been treated as conspecific with *M. fasciolata*; the two were recently resplit on basis of plumage, morphology, display and genetic differences; boundary between the two species in Eastern Cape requires investigation. Race *marjoriae* also genetically distinct, but plumage differences from nominate slight; further study needed. Nominate shows clinal variation in overall coloration, from generally more rufous birds in extreme W South Africa (proposed race *adendorffi*) towards darker birds in S, but these extremes virtually matched by notable individual variation at any one site. Proposed race *algoensis* (Port Elizabeth area) very similar to nominate, and not reliably separable, especially in view of marked individual variation within nominate. Two subspecies recognized
Subspecies and Distribution.
M. a. apiata (Vieillot, 1816) - SW Namibia and W coastal plain and interior of South Africa (Northern Cape and Western Cape E to Grahamstown).
M. a. marjoriae Winterbottom, 1956 - coastal plain of Western Cape (from Cape Town E to Knysna).



Descriptive notes. 12-14 cm; 23-33 g. Fairly small, compact lark with plain face, rather dark plumage, distinctive fast wing-clapping display. Is heavily mottled chestnut, dark brown and grey above, individual feathers on crown, back, wing-coverts and tertials barred dark brown and rich chestnut, variable, in NW (Namaqualand) on average more chestnut above and sometimes having almost uniform chestnut crown ("*adendorffi*"); flight-feathers mostly dark brown, edge of outer webs rufous; outer tail feather edged buffy white, this extending variably on to inner web; throat whitish, rest of underparts rich buffy, breast variably spotted with dark brown, spots usually extending on to throat; eyes brown; bill dark greyhorn, with paler base to lower mandible; legs flesh-brown. Distinguished from *M. fasciolata* by slightly smaller size, darker and less rufous appearance, less rufous on flight-feathers, also faster display-clapping. Sexes alike. Juvenile has pale-tipped upperpart feathers. Race *marjoriae* is darker than nominate, with broader dark brown bars and narrower chestnut bars on upperpart feathers. Voice. True song replaced by aerial wing-clapping display, accompanied by a simple, ascending whistle, "phoooeeee" (most populations); *marjoriae* gives two descending whistles, "tseeoo tseeuuu", which commence earlier in display, could be confused with song of *Certhilauda brevirostris*. Occasionally mimics other species, but much less frequently than does *M. fasciolata*. Singing occurs mostly in morning and evening, but often continues after dark, especially on moonlit nights.
Habitat. Prefers densely vegetated habitats; favours areas with restios such as sand-plain fynbos and arid mountain fynbos, but also Renosterveld shrubland and Karoo scrub. Also occurs in fallow fields, and occasionally in dense cereal crops, where these abut natural vegetation. Generally avoids strandveld vegetation along coast.
Food and Feeding. Little known. Probably mostly insects and some seeds. Feeds on the ground. Rather unobtrusive; if approached, prefers to creep away rather than to fly.
Breeding. Aug-Oct. Probably monogamous; territorial. Display tends to be strongly seasonal, linked to breeding activity; displaying male moves slowly around territory, or makes circuits during flights, rises steeply from ground or low perch, clapping wings together beneath body, rate of clapping rises from initial 12-14 beats per second to more than 25 per second at peak of ascent, whereupon it whistles and parachutes to ground; usually 10-15 seconds between displays, but sometimes multiple displays in same flight, with bird undertaking extended display-flights similar to those of *M. rufocinnamomea*; maximum clap rate varies less than other display characteristics, and very little variation among fastest-clapping males, suggesting that direct selection for fast clapping exists. Nest in shallow depression in ground, usually at base of a plant, cup lined with grass, rootlets and other vegetation, this usually extending over top to form a domed roof, or sometimes completely enclosing nest to leave only a single side entrance. Clutch 2-3 eggs; no information on parental duties or incubation and fledging periods.
Movements. Resident. Atlas survey records strongly seasonal, but this reflects seasonal differences in species' detectability.
Status and Conservation. Not globally threatened. Common in many parts of range. Present in Etosha National Park, Namibia. Despite extensive habitat loss to agriculture in coastal lowlands of

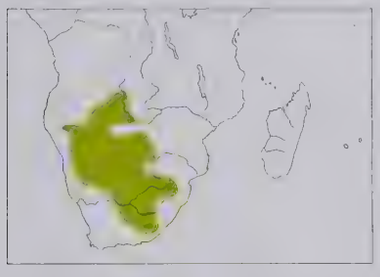
Western Cape, it remains reasonably common in many areas. Its range has contracted significantly on the flats near Cape Town as a result of urban expansion, leading to increasing isolation of the very small population in Cape Point sector of the Cape Peninsula National Park.
Bibliography. Cardwell & Dunning (1971), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Hester (2000), Keith *et al.* (1992), Macdonald (1952a), MacGregor & Feely (1952), Mackworth-Praed & Grant (1962), Maclean (1993a), Quickelberge (1970a), Ryan & Marshall (1998), Sinclair & Hockey (1996), Tarboton (2001), Vincent (1946).

23. Eastern Clapper Lark

Mirafra fasciolata

French: Alouette fasciée **German**: Ostklapperlerche **Spanish**: Alondra Aplaudidora Oriental
Other common names: Damara Clapper Lark ("*damarensis*"); Namaqua Clapper Lark (*fasciolata*)

Taxonomy. *Alauda fasciolata* Sundevall, 1850, Vaal River, Transvaal, South Africa.
Scientific name for species formerly given as *rufipilea*, but that name is apparently indeterminate. In the past, was usually treated as conspecific with *M. apiata*; the two were recently resplit on basis of plumage, morphology, display and genetic differences; boundary between the two species in Eastern Cape (South Africa) requires investigation. Geographical differences broadly clinal; further study may lead to several races being subsumed, especially in N of range (where only small series of specimens obtained); *damarensis* possibly an intergrade between *deserti* and *reynoldsi*. Name *hewitti* is a junior synonym of nominate. Birds from W Botswana (Ngamiland and Kalahari) described as race *kalaharica*, but not consistently different from *deserti*. Five subspecies currently recognized.
Subspecies and Distribution.
M. f. reynoldsi Benson & Irwin, 1965 - SW Zambia, N Namibia and N Botswana; probably also SE Angola.
M. f. jappi Traylor, 1962 - W Zambia.
M. f. nata Smithers, 1955 - NE Botswana.
M. f. deserti (Roberts, 1926) - EC Namibia and W, E & S Botswana.
M. f. fasciolata (Sundevall, 1850) - C & E South Africa.



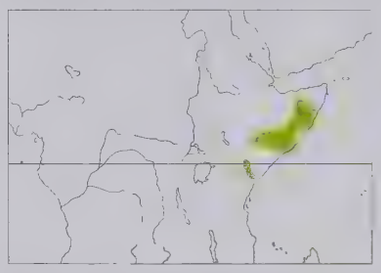
Descriptive notes. 13-15 cm; 26-44 g. Medium-sized, compact lark with a fairly short, stout bill, indistinct weak supercilium, and distinctive wing-clapping display. Nominate race has crown and upperparts rich rufous, upperparts finely barred dark and, in fresh plumage, with white tips of feathers; broad rufous bases of primaries (forming distinct rufous patch in flight); outer tail feather edged buffy white, this colour extending variably on to inner web; throat whitish, rest of underparts rufous-buff, with some indistinct brown spotting on breast; eyes brown; bill dark grey-horn; legs flesh-brown. Distinguished from *M. apiata* by larger size (on average c. 10% bigger), heavier and paler bill, plainer and more rufous plumage, less extensive spotting below, also slower wing-clapping in display; from *M. rufocinnamomea* by appreciably larger size, paler plumage, heavier bill; from *M. africana* mainly by smaller size, shorter bill, plain or finely barred upperparts lacking strong dark streaks. Sexes alike in plumage. Juvenile has pale-tipped upperpart feathers. Races vary markedly in plumage colour, upperparts becoming paler and greyer and underparts whitish in N: *deserti* is larger and paler than nominate; *reynoldsi* is ash-grey with variable pale sandy tinge above, typically pale creamy with irregular buff-brown tinge below, underparts sometimes darker brown; *nata* resembles previous, but mantle paler, greyish to light sandy-brown, crown usually reddish (variable); *jappi* is darker with browner barring above, browner below. Voice. Displaying male gives ascending whistle, "phooeeee", similar to that of *M. apiata* but with less change in pitch, also extra notes frequently added, e.g. "phooeeee weeter-eeter-eerrr"; mimics other birds more often than does *M. apiata*.
Habitat. Tall grassland, often in rocky areas, in S; sparse, semi-arid grasslands in Kalahari Desert; grassy margins of pans and plains farther N. Generally avoids croplands, but occurs in lightly grazed rangelands.
Food and Feeding. Insects, including termites (Isoptera) and ants, also other invertebrates; also seeds. Forages on ground. Occasionally follows aardvarks (*Orycteropus afer*), searching their diggings for termites.
Breeding. Season Sept-Feb. Monogamous and territorial. Displaying male rises steeply from ground and claps wings beneath body, uttering whistle at peak of ascent, before parachuting back to ground, or, more often, conducts extended flights with repeated clapping for up to 10 minutes; unlike *M. apiata*, no acceleration in wing-clap rate during display. Nest built in shallow depression in ground, at base of a grass tuft, between two tufts or next to a rock, lined with grass or other vegetation, with domed roof sometimes completely enclosing nest apart from side entrance hole; thickness of lining and of roof varies, from thin and flimsy to quite substantial. Clutch 2-3 eggs; no information on parental duties and duration of incubation period; when nest approached, parents perform distraction display by flying low in front of intruder and snapping the wings; chicks leave nest 11 days after hatching, before able to fly.
Movements. Probably resident, but subject to local movements in areas where habitat flooded seasonally and, perhaps, in more arid areas. Atlas-survey records show peak in reporting rate in Sept-Jan, coinciding with peak in breeding activity.
Status and Conservation. Not globally threatened. Locally common and widespread in S of range; patchily distributed in N; is easily overlooked when not displaying. Although it has suffered habitat loss through development for agriculture, especially in S of its range, it is still common in many parts. Large numbers are conserved in formally protected areas.
Bibliography. Benson *et al.* (1971), Harrison *et al.* (1997), Hester (2000), Irwin (1958), Keith *et al.* (1992), Macdonald (1952a), Penry (1994), Quickelberge (1970a), Sinclair & Ryan (2003), Vernon (1973), Vernon & Dean (1988).

24. Collared Lark

Mirafra collaris

French: Alouette à collier **German**: Halsbandlerche **Spanish**: Alondra Acollarada
Other common names: Collared Bushlark

Taxonomy. *Mirafra collaris* Sharpe, 1896, Aimola, north-east Kenya.
Affinities to *M. apiata* and *M. fasciolata* suggested by clapping display-flight, although wing-clapping performed also by unrelated *Chersophilus duponti*. Preliminary genetic data suggest affinities with *Calendulauda*. Monotypic.
Distribution. SE Ethiopia, Somalia and NE & E Kenya.



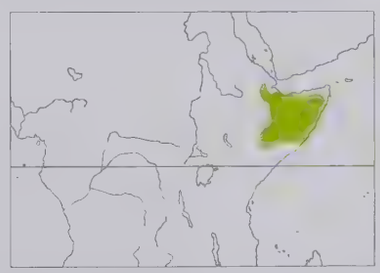
Descriptive notes. 13-15 cm. Plain rufous lark with distinctive black breastband. Has face quite well marked, with prominent whitish supercilium; crown and ear-coverts rufous, nape and neck side whitish with black streaks, forming distinct hindcollar; upperparts rufous, fine white streaks formed by pale edges of inner feather margins, wing-coverts edged paler buff in fresh plumage; blackish flight-feathers and tail (distinctive in flight), primaries tipped and edged white; throat white, sharply defined black band on upper breast, contrasting also with rufous-streaked lower breast, rest of underparts paler; eyes brown; bill dark brown above, whitish below; legs pale pink-brown. Distinguished from superficially similar *Calendulauda alopex* by collar, breastband and blackish flight-feathers. Sexes alike. Juvenile lacks distinctive collar, has pale-fringed upperpart feathers with dark subterminal bands (scaly appearance), buffy breast with blackish-brown spots, white belly. Voice. Male song a plaintive, ascending whistle that increases in volume, then fades away, usually uttered from perch after wing-clapping display-flight, sometimes also while descending from display.
Habitat. Semi-arid savanna, grassland with scattered shrubs, and open acacia (*Acacia*) and *Commiphora* woodland. Invariably found on red sands.
Food and Feeding. Grasshoppers (Acrididae), caterpillars, other insects, also seeds. Feeds on ground; reluctant to fly, runs off rapidly if pursued.
Breeding. Nests with eggs found in May in Ethiopia and Somalia; displays in Oct in Kenya. Probably monogamous. Displaying male rises steeply from ground, clapping wings beneath body, to height of 10-15 m, and then glides or slow-flaps gently downwards, sometimes changing direction once or twice as it drops, usually lands on top of bush or small tree or, more rarely, on ground, and calls. Nest built in shallow scrape at base of a grass tuft, cup lined with dry grass, and grass built over top to form domed roof. Clutch 2-3 eggs (mean 2·7); no information on parental duties or incubation and fledging periods.
Movements. Presumably resident.
Status and Conservation. Not globally threatened. Locally common. Density of 1-2 displaying males/ha recorded after rain. No clear threats known.
Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Bennun & Njoroge (1999), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

25. Gillett's Lark

Mirafra gilletti

French: Alouette de Gillett **German**: Gillettlerche **Spanish**: Alondra de Gillett

Taxonomy. *Mirafra gilletti* Sharpe, 1895, Sibbe, Ogaden country, north-west Somalia.
Widely regarded as forming a superspecies with *M. degodiensis*; the two occur within 50 km of each other with no known overlap in ranges, although region is poorly known ornithologically. Has also been suggested to form a superspecies with *M. rufa* and the taxon *poecilosterna*, although genetic evidence indicates that latter better placed in genus *Calendulauda*; also bears close resemblance to *C. alopex* of race *intercedens*, and thus possibly better shifted to that genus; no genetic data yet available for present species or *M. rufa*. Race *arorihensis* intergrades with nominate in NW Somalia. Two subspecies recognized.
Subspecies and Distribution.
M. g. gilletti Sharpe, 1895 - E Ethiopia, W Somalia and extreme NE Kenya.
M. g. arorihensis Érard, 1975 - Somalia.



Descriptive notes. 16-17 cm; 20-26 g. Medium-sized lark with rufous-brown upperparts, broad whitish supercilium and well-marked face. Plumage is largely rufous-brown above; upperparts variably streaked dark brown, rump and uppertail-coverts a greyer brown and contrasting somewhat with more rufous back; greater and median wing-coverts dark brown, broadly fringed rufous-brown; flight-feathers brown with narrow buff edges, tertials broadly edged rufous-brown; tail brown, central feathers broadly edged rufous; whitish below, breast with rufous streaks, sometimes darker brown centrally; eyes light brown; bill dark brown above, paler below; legs pale brown. Distinguished from *M. degodiensis* by darker and more rufous upperparts, stronger breast markings; from similar *Calendulauda alopex* (of race *intercedens*) by slightly larger size, less streaking above, no contrast between back and rump, buff (not rufous) edges of flight-feathers, paler breast streaks, different habitat. Sexes alike. Juvenile unknown. Race *arorihensis* is paler and more rufous above than nominate. Voice. Little known; reported as calling "dsee-dsit" from elevated perch, usually top of small tree or bush; also gives longer song in aerial display.
Habitat. Semi-arid savanna and scrub, typically on hard substrates, often near rocky areas; absent from soft, sandy soils to which *Calendulauda alopex* is confined. In Somalia, avoids areas with annual rainfall less than 75 mm or more than 450 mm, being replaced in more mesic areas in S by *Calendulauda poecilosterna*. Occurs from near sea-level to 1500 m.
Food and Feeding. Beetles (Coleoptera), caterpillars, grasshoppers (Acrididae) and seeds. Feeds on ground.
Breeding. Breeds Apr-Jun in Somalia. Monogamous; occurs singly or in pairs throughout year. Displaying male flies up to 100 m above ground for several minutes, singing continuously, then plummets vertically back to earth. Nest a shallow scrape at base of a grass tuft or shrub, lined with a cup of fine grass stems and rootlets. Clutch 3 eggs; nothing known about parental duties or incubation and fledging periods.
Movements. Apparently resident.

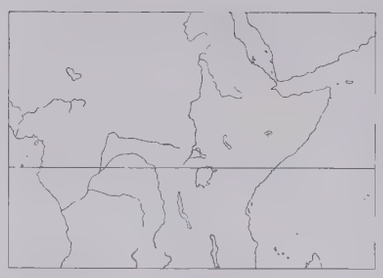
Status and Conservation. Not globally threatened. Fairly common, but thinly distributed and nowhere abundant. Present in Awash National Park, Ethiopia. No obvious threats.
Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Bennun & Njoroge (1999), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Érard (1975a), von Erlanger (1907), Fishpool & Evans (2001), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Miskell & Ash (1985), Shirihai & Francis (1999), Short *et al.* (1990), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

26. Degodi Lark

Mirafra degodiensis

French: Alouette du Degodi **German**: Degodilerche **Spanish**: Alondra de Degodi
Other common names: Erard's Lark

Taxonomy. *Mirafra degodiensis* Érard, 1975, Bogo-Mayo, Degodi, Sidamo Province, south Ethiopia. Possibly better placed in genus *Calendulauda*. Usually considered to form a superspecies with *M. gilletti*; the two occur within 50 km of each other with no known overlap in ranges, although region is poorly known ornithologically. Monotypic.
Distribution. Near Bogol Manya, in Degodi region of S Ethiopia.
Descriptive notes. 16 cm. Medium-sized lark, finely but densely streaked above, resembling a pipit (*Anthus*). Has whitish supercilium contrasting with dark brown eyestripe and pale rufous-washed ear-coverts; dull brown above, crown washed rufous to sandy, slightly paler and greyish-brown on nape; wing-coverts have broad buffy margins, especially median coverts (which appear as a row of blackish spots above a pale wingbar); flight-feathers dark brown with narrow buff margins; underparts white or creamy white, breast with rufous-brown streaks; eyes dark brown; bill pale horn, darker and greyer above; legs pinkish to brownish. Distinguished from *M. gilletti* by slightly smaller size, paler and less rufous upperparts, less heavily streaked breast; from *Calendulauda alopex* mainly by lack of rufous wingpanel; from structurally similar *Calendulauda poecilosterna* by more patterned upperparts, less mottled breast. Sexes alike. Juvenile unknown.



Voice. Calls "tsee tsee" from top of small bush; playback of this elicited short, lower-pitched song, "twill-ill-ill-ill-ill-it". Also reported as uttering repeated sibilant trill, similar to that of *C. poecilosterna*, with occasional notes similar to those of *M. gilletti*.
Habitat. Arid acacia (*Acacia*) scrub with little ground cover, at 300-400 m elevation.
Food and Feeding. Grasshoppers (Acrididae) and small caterpillars. Feeds on ground, typically remaining in shade of bushes during most of day. Occurs singly or in pairs.
Breeding. No information; nest and eggs undescribed.
Movements. Apparently resident.
Status and Conservation. VULNERABLE. Restricted-range species: present in Jubba and Shabeelle Valleys EBA. Known from only a very small area of S Ethiopia, having estimated total range of 430 km^2. Global population estimate of fewer than 1000 individuals, but this extremely tenuous; may well be more common. No recent systematic searches of the general region, which is troubled by banditry. Status poorly known; concerns about possible habitat loss and degradation through grazing and firewood-collecting resulted in its being listed as globally threatened, although possibly more accurately categorized as Data-deficient. As there are no protected areas within its range, however, a precautionary approach is warranted. Conservation targets include fieldwork aimed at accurately assessing the species' current range and abundance, and identifying threats to its habitat.
Bibliography. Ash & Gullick (1990), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Érard (1975a), Fishpool & Evans (2001), Hockey (1997a), Keith *et al.* (1992), Shirihai & Francis (1999), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Webb & Smith (1996).

PLATE 55 ➤

PLATE 55


inches
4
cm
10
27
28
29
30
ssp *waibeli*
ssp *sabota*
ssp *africanoides*
ssp *makarikari*
31
32
ssp *vincenti*
ssp *bradfieldi*
ssp *naevia*
ssp *intercedens*
ssp *alopex*
33
34
variants
ssp *cavei*
ssp *barlowi*
ssp *guttata*
ssp *albescens*
35
36
ssp *codea*
ssp *patae*
37

Genus *HETEROMIRAFRA*

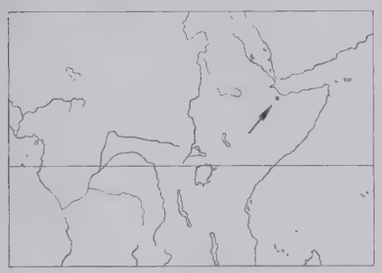
C. H. B. Grant, 1913

27. Archer's Lark

Heteromirafra archeri

French: Alouette d'Archer **German**: Somalispornlerche **Spanish**: Alondra de Archer
Other common names: Archer's Long-clawed Lark, Somali (Long-clawed) Lark

Taxonomy. *Heteromirafra archeri* S. R. Clarke, 1920, Jifa, 5000 feet [c. 1500 m], Somalia.
Forms a superspecies with *H. sidamoensis* and *H. ruddi*. Monotypic.
Distribution. NW Somalia.



Descriptive notes. 15-16 cm. Peculiar short-tailed, large-headed lark with extremely long hind claw. Has pale median crownstripe, broad creamy supercilium; boldly patterned above, with rufous and dark brown feathers broadly edged buff and whitish on crown and back, paler neck and mantle buffy brown with dark streaks; wing-coverts and tertials broadly edged creamy buff; flight-feathers dark brown with narrow buff edges; tail dark brown with cream-buff margins, outer feather entirely creamy buff; underparts creamy buff, with fine dark brown streaks on breast; eyes brown; bill pale horn-brown above, whitish-horn below; legs pale flesh-brown. Distinguished from *H. ruddi* by slightly larger size, paler upperparts (broader pale feather margins), better-defined spots on breast; from *H. sidamoensis* by slightly smaller size and paler plumage, with creamy (rather than warm rufous-buff) feather edges; from *Mirafra cantillans* by larger size, much shorter tail, rufous in wing. Sexes alike. Juvenile unknown. VOICE. Unknown.
Habitat. Open grassland at one site (between Jifa and Ban Wujaleh); at other, 100 km to NW (N of Buramo), more rocky terrain with sparse shrubland and scattered grass. Both sites at 1500 m elevation, with annual rainfall 300-400 mm.
Food and Feeding. Diet unknown. Extremely secretive; when disturbed, creeps through grass in manner of a rail (Rallidae) and scuttles across open patches.
Breeding. Little known. Breeds in Jun. Probably monogamous. Display not known. Nest built from fibrous brown grass woven deep into base of a sheltering grass tuft; described as funnel-shaped, presumably an elongate, completely domed cup like that of *H. ruddi*. Clutch 3 eggs; nothing known about parental duties or incubation and fledging periods.
Movements. Probably resident.
Status and Conservation. VULNERABLE. Extremely small range; known from only two small areas in NW Somalia. Originally discovered in 200 km² of open grassland between Jifa and Ban Wujaleh; later found 100 km NW of there, at locality N of Buramo. Total population estimated at fewer than 1000 individuals, but this figure extremely uncertain. Last seen in 1955; more recent surveys in 1970s and 1990s failed to locate it at either site, or in similar habitat in adjacent areas of Ethiopia; recent claims that it had been discovered on Ethiopia-Somalia border subsequently retracted. Possibly more widespread than the few records suggest, as it is easily overlooked. There are no protected areas within its range, and the grassland site near Jifa has been settled by refugees. Main conservation targets are to relocate this species and accurately to assess its range and abundance, as well as likely threats to its survival.
Bibliography. Anon. (1996d), Archer & Godman (1937-1961), Ash & Miskell (1998), Clarke (1920), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Mackworth-Praed & Grant (1960), Sinclair & Ryan (2003), Stattersfield & Capper (2000).

28. Sidamo Lark

Heteromirafra sidamoensis

French: Alouette d'Érard **German**: Sidamospornlerche **Spanish**: Alondra de Sidamo
Other common names: Sidamo Bushlark, Ethiopian Long-clawed/Sidamo Long-clawed Lark

Taxonomy. *Mirafra sidamoensis* Érard, 1975, Negelli, Sidamo Province, Ethiopia.
Forms a superspecies with *H. archeri* and *H. ruddi*. Monotypic.
Distribution. Area S of Negele (Sidamo Province), in S Ethiopia.



Descriptive notes. 16-17 cm; 30 g. Peculiar short-tailed, large-headed, lark with long slender neck, extremely long hind claw. Large dark eye contrasts with pale supercilium, relatively plain rufous-brown ear-coverts and buffy lores; pale median crownstripe; feathers of crown, back, wing-coverts and tertials dark rufescent brown, each with blackish centre and subterminal fringe, and prominent buff to white fringe, giving scaly appearance, shafts of wing-coverts and tertials white; nape and mantle pinkish- to greyish-buff with darker streaks, streaks extending from neck down to breast side; flight-feathers dark rufous-brown with pale pinkish-buff outer margins, tail browner, outer rectrix dark pinkish-fawn; whitish below, variable buff wash on breast and flanks; eyes dark brown; bill yellowish-horn; legs and feet straw-brown to pinkish. Differs from *H. archeri* and *H. ruddi* in slightly larger size and more rufous appearance, darker outer tail, at close range white shafts of wing-coverts and tertials; readily distinguished from *Mirafra rufocinnamomea* by general shape, distinctive plumage features, also different display. Sexes alike. Juvenile unknown. VOICE. Male song a series of buzzy whistles and trills, longer and more varied than that of *H. ruddi*, typically given in aerial display; when flushed, sometimes a soft "tswee-ee-eep" while hovering briefly 3-4 m above ground.
Habitat. Open grassland patches with scattered bushes among denser semi-arid acacia (*Acacia*) savanna and woodland, at 1450 m.
Food and Feeding. Diet unknown. Often stands upright, but when disturbed scuttles away, keeping to dense cover, and hard to relocate; behaviour similar to that of congeners.
Breeding. Virtually unknown. Display observed in Jan-May. Sings in protracted aerial display, with several males calling at once while circling over territories. Nest and eggs undescribed.
Movements. Probably resident.
Status and Conservation. VULNERABLE. Restricted-range species; present in South Ethiopian Highlands EBA. Known from only two sites, both rather atypical open areas of short grass in semi-arid acacia savanna. Potential global range estimated as 5400 km² and total population as 2500-10,000 individuals by BirdLife International; basis for this rather large range estimation, however, unclear. No recent systematic surveys; the species was not located during several visits to the area, but is easily overlooked if not calling. No protected areas exist within its range. Conservation targets include accurate mapping of its area of distribution and the identification of any specific threats to its habitat.
Bibliography. Ash & Olson (1985), Collar (1997), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Érard (1975b), Fishpool & Evans (2001), Hockey (1997a), Keith *et al.* (1992), Robertson (1995), Shirihai & Francis (1999), Sinclair & Ryan (2003), Stattersfield & Capper (2000).

29. Rudd's Lark

Heteromirafra ruddi

French: Alouette de Rudd **German**: Transvaalspornlerche **Spanish**: Alondra de Rudd
Other common names: Rudd's Long-clawed Lark, (South African) Long-clawed Lark

Taxonomy. *Heteronyx ruddi* C. H. B. Grant, 1908, Wakkerstroom, Mpumulanga, South Africa.
Forms a superspecies with *H. archeri* and *H. sidamoensis*. Monotypic.
Distribution. NE & E South Africa; isolated populations in SE Mpumulanga, E Free State, KwaZulu-Natal and Eastern Cape.



Descriptive notes. 14-15 cm; 26-27 g. Peculiar lark with very short thin tail, extremely long hind claw, rather slender bill extending up forehead almost as "shield" (deep, unusually broad base); in erect stance, head appears large on a long, slender neck. Has pale median crownstripe, prominent pale supercilium, darker eyestripe, mottled buff-brown ear-coverts; large, dark eye prominent in otherwise rather plain face; crown and back feathers blackish-brown with buff fringes, contrasting with paler buffy-brown neck and mantle, which only lightly streaked darker; flight-feathers dark brown with rufous edges, tail with narrow white margins of outer feathers; cream below, diffuse brown streaks on buff-washed breast; eyes brown; bill pinkish-horn, slightly darker tip; legs pale pink. Distinguished from *H. archeri* by slightly smaller size, darker-looking upperparts (narrower pale fringes), bigger but more diffuse spots on breast; from *H. sidamoensis* by slightly smaller size, less rufous appearance, paler outer tail. Sexes alike. Juvenile has broader buff margins above, appearing more heavily scaled. VOICE. Male song, usually in aerial display, sporadically also from ground, a buzzy series of 3-8 (mean 6) whistles, trills and clicks, repeated every 5 seconds, each song motif repeated 10-20 times before switching to another motif, sometimes different motifs alternated with only few repeats of each; repertoire size not known but each motif created by reordering or omission of notes. Rapid series of 5-7 "peep" notes, 1 per 0·1 seconds, as alarm, usually near nest.
Habitat. Moist montane grassland, at 1600-2200 m, in areas where annual rainfall predictably exceeds 600 mm. Usually found on ridges and slopes with short, dense grass but relatively low ground cover. Prefers natural grassland that is moderately to heavily grazed; avoids planted pastures and rocky areas.
Food and Feeding. Caterpillars, grasshoppers (Acrididae), beetles (Coleoptera), other insects, also seeds. Feeds on ground, walking quickly for a few paces, then stopping and standing erect to survey area; gait recalls that of *Chersomanes albofasciata*, but perhaps more "leggy", and centre of gravity farther forward. Forages singly, taking most prey from bases of grass tufts, or gleaning from leaves; not known to dig for food. Crouches when threatened, and scurries away through grass.
Breeding. Breeds Nov-Feb. Monogamous; territorial, with adjacent nests at least 100 m apart. Displaying male circles 20-30 m over territory, or hangs motionless by fluttering slowly into wind, for protracted period, up to 40 minutes; before copulating, struts in front of female while holding a beakful of nesting material. Nest built by one of pair (probably female), which collects all material within radius of 10 m of site, in one case material delivered 10 times in 30 minutes; in scrape in ground between two grass tufts, made from old grass stems and leaves, lined with finer material, once including a piece of wool, well constructed, with thick roof and walls forming dome, often a short entrance tube; no regular pattern in nest orientation. Clutch 3 eggs, rarely 2, will re-lay several times following loss of clutch; incubation period not known, although eggs hatch within at least 14 days; chicks fed by both parents, fledging period unknown. Breeding success low, daily nest-failure rate 8-9%; most losses apparently due to predation.
Movements. Resident.
Status and Conservation. CRITICAL. Restricted-range species; present in South African Grasslands EBA. Occurs as several isolated populations limited to grasslands; potential range 22,000 km², but actual range probably much smaller. Global population estimated at 2500-5000 individuals, the

On following pages: 30. Pink-breasted Lark (*Calendulauda poecilosterna*); 31. Sabota Lark (*Calendulauda sabota*); 32. Fawn-coloured Lark (*Calendulauda africanoides*); 33. Foxy Lark (*Calendulauda alopex*); 34. Red Lark (*Calendulauda burra*); 35. Karoo Lark (*Calendulauda albescens*); 36. Barlow's Lark (*Calendulauda barlowi*); 37. Dune Lark (*Calendulauda erythrochlamys*).

vast majority in Mpumulanga, E Free State and N KwaZulu-Natal; small, isolated populations occur near Matatiele (SW KwaZulu-Natal), Ncora Dam and Molteno (Eastern Cape). Even where present, it is very patchily distributed within seemingly suitable habitat; density reaches 1 singing male/ha; becomes hard to locate outside breeding season. This species' population has been severely fragmented by agriculture and afforestation. Most individuals are found on privately owned land; only a few in the Verloren Vlei Nature Reserve. The establishment of a Grassland Biosphere Reserve centred on Wakkerstroom, in Mpumulanga, would encompass a significant number of this species, but progress towards this goal has been slow. Conservation targets include research to facilitate an understanding of reasons for its patchy distribution, and the identification of beneficial land-management practices.

Bibliography. Allan (2001), Barnes (2000), Brooke (1984b), Clancey (1964b), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Evans, S.W. (1999a), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Herholdt & Grobler (1987), Hockey *et al.* (1988), Keith *et al.* (1992), Mackworth-Praed & Grant (1962), Maclean (1993a), Muchai (2002), Sinclair & Hockey (1996), Stattersfield & Capper (2000), Tarboton (2001).

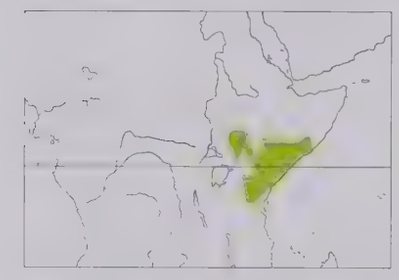
Genus *CALENDULAUDA* Blyth, 1855

30. Pink-breasted Lark

Calendulauda poecilosterna

French: Alouette à poitrine rose **German**: Fahlbrustlerche **Spanish**: Alondra Pechirrosa

Taxonomy. *Alauda poecilosterna* Reichenow, 1879, Kibaradja, Tana River, Kenya.
Formerly placed in genus *Mirafra*, and suggested as forming a superspecies with *M. rufa* and *M. gilletti*; genetic data, however, indicate that it belongs in the *Calendulauda* clade. Geographical variation in plumage tone, darkest and richest in S; birds from extreme N of range (SE Sudan E to S Somalia) described as race *australoabyssinica* and others from rest of range (except N & E Kenya) as *massaica*, but differences minimal, and naming of races considered unwarranted. Monotypic.
Distribution. Extreme SE Sudan and S Ethiopia E to S Somalia, S to NE Uganda, much of Kenya and NE Tanzania.



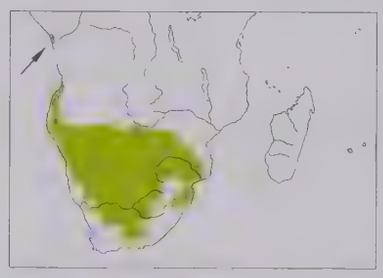
Descriptive notes. 15-16 cm; 23-26 g. Rather peculiar lark with shape like that of a pipit (*Anthus*), having slender bill, long tail, comparatively plain plumage, rather horizontal stance. Plain, pink-washed buffy face and breast are distinctive; relatively plain grey-brown above, with noticeably grey crown; wing-coverts have paler fringes, especially on median coverts, forming indistinct pale wingbar; flight-feathers brown with narrow pale edges, tail brown; pinkish-buff below, breast variably streaked brown, lower underparts white; eyes dull red-brown; bill dark horn with much paler base; legs pale flesh-brown. Sexes alike, female slightly smaller. Juvenile is slightly more rufous below, with more prominent dark spotting on breast. Voice. Song a monotonous, simple series of 6-8 squeaky notes, accelerating and descending in pitch towards end. Also soft "tseet", given sometimes from ground.
Habitat. Arid acacia (*Acacia*) and *Commiphora* savanna and scrub, typically in areas with little ground cover. Prefers sandy soils.
Food and Feeding. Food mostly insects, including large numbers of termites (Isoptera); some seeds. Feeds on ground, mostly by picking items from soil surface.
Breeding. Breeds during rains, laying dates Dec-Jan and Mar-Jun. Monogamous and territorial. Male typically sings from elevated perch, usually top of tall bush or tree; very rarely undertakes display flights. Nest a partially domed cup of dry grass in shallow depression on ground, usually next to a small bush, grass tuft or log. Clutch 2 eggs; no information on parental duties and incubation and fledging periods.
Movements. Resident; remains in pairs and holds territories throughout year.
Status and Conservation. Not globally threatened. Common in most areas. Its range has almost certainly decreased as a result of agriculture, as it avoids open fields and croplands.
Bibliography. Ash & Miskell (1998), Bennun & Njoroge (1999), Byaruhanga *et al.* (2001), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Friedmann (1937), Keith *et al.* (1992), Lack (1976, 1985), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Nikolaus (1987), Short *et al.* (1990), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

31. Sabota Lark

Calendulauda sabota

French: Alouette sabota **German**: Sabotalerche **Spanish**: Alondra Sabota
Other common names: Bradfield's/Large-billed Lark ("*naevia* group")

Taxonomy. *Mirafra Sabota* A. Smith, 1836, "between Latakoo and the Tropic" (= Rustenburg), Northwest Province, South Africa.
Formerly placed in genus *Mirafra*, but genetic data indicate that it belongs with present genus. Large-billed races *naevia*, *herero* and *bradfieldi* sometimes treated together as a separate species; limited genetic evidence supports this split, but further work needed. Geographical variation within both "small-billed group" and "large-billed group" broadly clinal, and further study may reveal that several taxa are not sustainable. Other named races are *elfriedae* (E end of Etosha Pan, in N Namibia), *hoeschi* (N Damaraland, in NC Namibia) and *veseyfitzgeraldi* (NW Botswana), all synonymized with *waibeli*, and Namibian forms *erongo* and *uis* (both from NW Damaraland), considered inseparable from *naevia*. Nine subspecies recognized.
Subspecies and Distribution.
C. s. plebeja (Cabanis, 1875) - extreme NW Angola (coast of Cabinda).
C. s. ansorgei (W. L. Sclater, 1926) - Angolan coastal plain S from W Cuanza Sul (from Sumbe).
C. s. naevia (Strickland, 1853) - NW Namibia.
C. s. herero (Roberts, 1936) - C & S Namibia.
C. s. bradfieldi (Roberts, 1928) - semi-arid Karoo regions in C South Africa.
C. s. waibeli (Grote, 1922) - N Namibia and N Botswana.
C. s. sabotoides (Roberts, 1932) - C & S Botswana, W Zimbabwe and NW South Africa (North-west Province).
C. s. sabota (A. Smith, 1836) - highveld savanna in E Botswana, Zimbabwe and E South Africa.
C. s. suffusca (Clancey, 1958) - SE Zimbabwe, S Mozambique, and lowveld of South Africa and Swaziland.



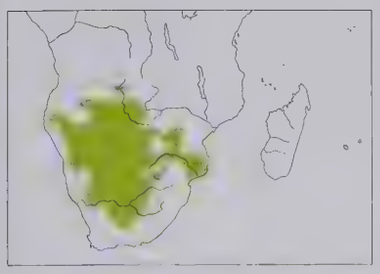
Descriptive notes. 14-15 cm; 21-31 g. Medium-sized lark with prominent pale supercilium, giving capped appearance. Nominate race has dark eyeline, thin black moustachial stripe; neck buffish, lightly streaked; mostly buffish-brown to rufescent with bold dark brown to blackish streaks above, crown feathers edged buff; scapulars and wing-coverts dark brown, broadly edged light brown to pale rufous; flight-feathers dark brown with narrow buff outer edges, tertials broadly edged rufous and light brown; tail dark brown, outer rectrix with buff outer web; throat white, breast washed light brown and heavily streaked dark brown, rest of underparts whitish, variably washed buffish to brown; eyes brown; bill horn, paler base; legs dull pinkish-brown. Differs from *C. africanoides* in having much bolder streaking above and on breast. Sexes alike. Juvenile is darker above, with pale-tipped feathers, breast spotted rather than streaked. Races differ primarily in upperpart colour and extent of streaking (typically are paler and less streaked in more arid areas), also in bill size (short and fairly slender in E, longer and heavier in W): *suffusca* is darker than nominate, upperpart streaking almost black; crown, mantle and scapulars duller and less rusty brown; *ansorgei* is pale and less streaked above; *plebeja* is somewhat browner than previous; *waibeli* is very pale with heavy dark brown streaks above; *sabotoides* is pale and somewhat pinkish-sandy above, streaks broad and dark; *bradfieldi* is rather pale and generally more sandy than nominate, bill very large (largest of all races); *herero* differs from previous in paler and sandier upperparts, whiter underparts, bill slightly smaller; *naevia* is like last but paler, more yellowish-tinged, with narrower streaking. Voice. Male song long and rambling, usually from elevated perch or in display-flight; accomplished mimic, elements from songs of more than 60 species reported, including dove (Columbidae) wing-clapping; one male included 59 songs and calls from 49 species during single 10-minute display. When alarmed, rapid chattering call, often interspersed with alarm calls of other species.
Habitat. Grassy karoo and variety of savanna habitats, ranging from arid fore-Namib and Kalahari thornveld in N to more mesic acacia (*Acacia*) savanna and mopane (*Colophospermum mopane*) woodland in SE. Prefers grassy areas. In W ("*naevia* group") often associated with rocky ridges, provided that some bush cover present.
Food and Feeding. Variety of insects, including caterpillars, grasshoppers (Acrididae), beetles (Coleoptera), termites (Isoptera) and ants; also seeds of grasses and forbs, and leaves and green stems. In the Namib Desert, seeds comprised 60% of food, insects 40%; in the Karoo, grass seeds made up 69% of all seeds consumed. Not recorded as drinking; all water requirements apparently obtained from food. Feeds on ground, picking items from the soil surface or gleaning from vegetation; occasionally digs for food, especially in W ("*naevia* group"). Moves on to burnt areas within 1 hour of a fire.
Breeding. Breeds in Oct-May, mostly Nov-Jan in E and Feb-Mar in W, associated with later onset of summer rains in W. Monogamous and territorial. Male sings from high perch (top of tree, telephone wire) or in aerial display, 20-50 m high; during display-flight circles over territory, typically does not sing during initial climb. Nest in shallow depression on ground, usually at base of a rock, bush or grass tuft, a cup lined with dry grass and rootlets, typically with domed roof at back and sides, with material woven into overhanging vegetation; in the Kalahari, all nests face S, thus gaining maximum shade. Clutch 2-4 eggs (mean 2·3); incubating bird reluctant to leave nest, and, when it does, may feign injury to distract and lead away potential predators; chicks fed by both parents; no data on incubation and fledging periods.
Movements. Largely resident; may make some local movements in response to rain. Some vagrancy indicated by a record from middle Zambezi Valley, in Zimbabwe.
Status and Conservation. Not globally threatened. Fairly common to common in much of range. Densities of c. 1 individual/ha in E of range, but only 1 bird/10 ha in C Kalahari. Substantial populations occur in protected areas. In some areas may benefit from low-level grazing by livestock, which creates openings in the grass and shrub layers.
Bibliography. Bannerman (1953), Clancey (1964b, 1966a), Dean (1987, 1997, 2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Jones (1997b), Keith *et al.* (1992), Mackworth-Praed & Grant (1962, 1970), Maclean (1970b, 1993a), Nuttall (1993), Penry (1994), Sinclair & Hockey (1996), Tarboton (2001), Vernon (1973), Willoughby (1971).

32. Fawn-coloured Lark

Calendulauda africanoides

French: Alouette fauve **German**: Steppenlerche **Spanish**: Alondra Leonada
Other common names: Fawn Lark/Bushlark

Taxonomy. *Mirafra africanoides* A. Smith, 1836, eastern Cape Colony (= Colesberg), Northern Cape, South Africa.
Formerly placed in genus *Mirafra*, but genetic evidence indicates that it belongs in a distinct clade formed by present genus. Often treated as conspecific with disjunct *C. alopex*, but differs genetically and in structure (shorter bill). Geographical variation largely clinal, plumage colour generally matching regional soil colour, and streaking reduced in more arid areas; races broadly intergrade, and further study may reveal that several of those currently accepted are unsustainable; other named races include *omaruru*, *gobabisensis* and *rubidior* (from various parts of NW & NC Namibia), all synonymized with *harei*, and *austinrobertsi* (from thornveld of Zimbabwe-Botswana-South Africa border region), synonymized with nominate. Six subspecies currently recognized.
Subspecies and Distribution.
C. a. trapnelli (C. M. N. White, 1943) - SE Angola and SW Zambia.
C. a. makarikari (Roberts, 1932) - SW Angola, N Namibia and N & C Botswana.
C. a. harei (Roberts, 1917) - NW & C Namibia.
C. a. sarwensis (Roberts, 1932) - W Botswana.
C. a. africanoides (A. Smith, 1836) - S Namibia, S & E Botswana, W Zimbabwe and N & NE South Africa.
C. a. vincenti (Roberts, 1938) - C Zimbabwe and S Mozambique.



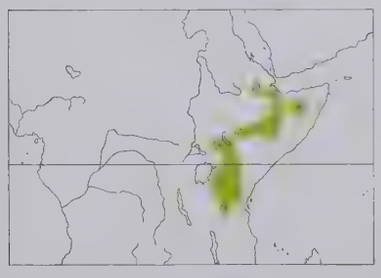
Descriptive notes. 14-16 cm; 21-28 g. Medium-sized lark with broad, long whitish supercilium, contrasting darker ear-coverts bordered pale below, and fairly short, stout pale horn-coloured bill. Nominate race is rufous with brownish streaks above, somewhat darker in E of range ("*austinrobertsi*"), rump less streaked than back; wing-coverts brown with rufous to buffish margins; brown flight-feathers have rufous edges, forming panel on folded wing (and conspicuous in flight); tail dark brown, central feather pair broadly edged rufous, outer pair narrowly edged whitish; white below, breast smudged rufous and lightly streaked darker reddish-brown; eyes pale brown; bill pale yellow-horn, with darker horn-grey upper half of maxilla; legs pinkish to flesh-coloured. Distinguished from *C. alopex* by duller and streaked upperparts, and paler bill in nominate; from *C. sabota* by less streaked face and breast, rufous wingpanel. Sexes alike, female on average slightly smaller. Juvenile has buff-fringed upperpart feathers with darker centres, appearing scaled, outer tail more broadly edged white. Races differ mainly in plumage colour and degree of streaking: *harei* is somewhat paler and less streaked than nominate; *sarwensis* is paler and sandier-coloured than previous, more buffish below, breast barely streaked; *makarikari* is slightly paler than last, more greyish above and below; *trapnelli* differs from previous in being darker, browner and more heavily streaked above; *vincenti* is usually grey or greyish with heavy dark streaking above, buff below. Voice. Typical song a rapid, accelerating series of rather high-pitched, scratchy notes lasting 3-4 seconds, repeated rather monotonously, from elevated perch, usually small tree or bush, or in aerial display; also mimics calls of other birds. Alarm call at nest "peek".
Habitat. Typically on sandy soils in semi-arid savanna and more mesic broadleaf woodland.
Food and Feeding. Insects and seeds. Grass seeds make up 54% of seeds consumed in the Karoo. Forages on ground, often digging in soft sand with its bill.
Breeding. Mostly in Sept-Apr, with peak in Nov-Feb, but breeding can occur at any time, especially in arid W, where triggered by rainfall. Monogamous and territorial; defends territory throughout year, although singing decreases in non-breeding season. Male has protracted aerial display lasting several minutes, circles 15-30 m above ground, with exaggerated wingbeats; also, sometimes confronts rival male on ground, making mock charges and standing with tail cocked, wings drooped, and raising and lowering crown feathers. Nest in shallow scrape in ground at base of a bush or grass tuft, lined with grass and rootlets, almost invariably domed, with nest material woven into sheltering plant; roof built first, then extended down to form cup lining, occasionally only a small raised rim constructed at back of nest, usually a broad "apron" of nest material outside entrance; nests usually face S or E, apparently to be shaded from sun. Clutch 2-4 eggs (mean 2·4); hatching synchronous, suggesting that incubation starts only when clutch complete, incubation period 12 days; chicks fed by both parents, remain in nest for 12-14 days; when nest approached, parents give alarm call and may perform fluttering display-flight to distract intruder. Breeding success in the Kalahari roughly 30%, with 73% of eggs hatching, 42% of chicks fledging.
Movements. Largely resident; some local movements indicated by records of pale birds (from the Kalahari) in E Botswana during drought years.
Status and Conservation. Not globally threatened. Common and fairly widespread in much of range; more local in E. Densities of up to 1 individual/ha in the Kalahari, but only 1 bird/40 ha in *Burkea* woodland in Limpopo Province of South Africa. Large populations occur in protected areas.
Bibliography. Benson *et al.* (1971), Bishop *et al.* (1992), Clancey (1966b), Dean (1997, 2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Keith *et al.* (1992), Lloyd (1998), Mackworth-Praed & Grant (1962), Maclean (1970a, 1970b, 1993a), Nuttall (1992), Penry (1994), Sinclair & Hockey (1996), Tarboton (1980, 2001), Vernon (1973), White (1965), Winterbottom (1965).

33. **Foxy Lark**

Calendulauda alopex

French: Alouette abyssinienne **German**: Fuchslerche **Spanish**: Alondra Vulpina
Other common names: Abyssinian Lark/Bushlark

Taxonomy. *Mirafra alopex* Sharpe, 1890, Somalia.
Formerly placed in genus *Mirafra*, but genetic evidence indicates that it belongs in a distinct clade formed by present genus. Often treated as conspecific with disjunct *C. africanoides*, but differs genetically and in structure (longer bill). Nominate race very distinctive, separated geographically from *intercedens*; the two may represent different species. Described races *macdonaldi* (S Ethiopia) and *longonotensis* (E Uganda, W Kenya) considered synonymous with latter. Two subspecies recognized.
Subspecies and Distribution.
C. a. alopex (Sharpe, 1890) - N Somalia and extreme E Ethiopia.
C. a. intercedens (Reichenow, 1895) - E & S Ethiopia, immediately adjacent NW & SW Somalia, E Uganda, Kenya and N Tanzania.



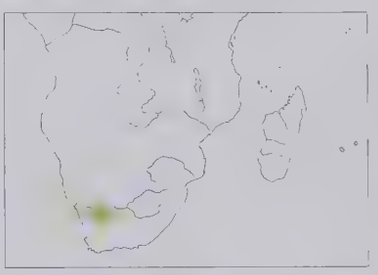
Descriptive notes. 14-16 cm; c. 24 g. Medium-sized lark with broad, extensive pale supercilium that contrasts with darker ear-coverts and lores. Nominate race is distinctive, plain chestnut above, with any streaking restricted to dark feather shafts, supercilium buffy; dark brown flight-feathers have broad rufous edges, forming panel on folded wing (and conspicuous in flight); tail dark brown, central feather pair broadly edged rufous or paler brown, outer pair narrowly edged buffy or whitish; light buffy below, breast washed rufous and with a few darker chestnut streaks; bright rufous underwing (distinctive in flight); eyes brown; bill dark grey or horn, pale pinkish base of lower mandible; legs pale greyish-pink. Sexes alike. Juvenile has pale-fringed upperpart feathers, more diffuse spots on breast. Race *intercedens* is very different, supercilium white, lores blackish, dark brown and heavily streaked above, dark brown streaks or chevrons on breast and sometimes rufous wash on breast side, variable, upperpart feathers broadly edged rich rufous-chestnut or paler sandy brown, rufous birds (more frequent at lower elevations) richer buff below, sometimes treated as two morphs but all birds in fresh plumage noticeably more rufous, also some regional variation, on average paler and less streaked in more arid areas; very like *Mirafra gilletti* but typically less rufous, with broader streaks above, no contrast between rump and tail-coverts, rufous-edged flight feathers, darker brown chest streaks; in SW Kenya (Nakuru S to Loita Plains) also a rare grey morph which is almost blackish above in worn plumage. Voice. Song (race *intercedens*) a short, hurried, rather thin verse, similar to that of *C. africanoides*, usually given from top of small tree or other elevated perch, or in short song-flight; includes mimicry of calls of other birds, e.g. cisticola (*Cisticola*) alarm, scrub-robins (*Cercotrichas*) and tits (*Parus*). Song of nominate poorly known; reported as "peculiarly sweet", uttered during aerial display.
Habitat. Almost invariably found on sandy soils. Nominate race in open grassland with scattered shrubs and termite (Isoptera) mounds, as well as small clearings in dense thorn-scrub. Race *intercedens* occurs in savanna and open grassland with scattered acacia (*Acacia*) shrubs and trees, from 500 m to 1800 m. Nominate in more arid scrub and at lower elevations (600-750 m) than adjacent populations of *intercedens* (1200-1650 m).
Food and Feeding. Insects and seeds. Forages on ground.
Breeding. Breeds in Mar-Jun. Probably monogamous; occurs singly or in pairs throughout year. Male has short aerial display. Nest and eggs not described; probably much as for *C. africanoides*.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Common to locally common in suitable habitat.
Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Benson (1946a), Byaruhanga *et al.* (2001), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

34. **Red Lark**

Calendulauda burra

French: Alouette ferrugineuse **German**: Kalaharilerche **Spanish**: Alondra Roja
Other common names: Ferruginous Lark, Sand Lark(!)

Taxonomy. *Ammomanes burra* Bangs, 1930, Great Namaqualand, South Africa.
Originally described as *Alauda ferruginea*, but that name invalid, as preoccupied. Formerly placed in genus *Ammomanes* on the basis of plain back and stout bill. Forms a superspecies with *C. albescens*, *C. barlowi* and *C. erythrochlamys*. Geographical variation in coloration and degree of upperpart streaking largely linked to soil type; brownish birds with streaked back (from Brandvlei area) named as race *harei* and others with more heavily streaked underparts (from Vanwyksvlei) as *aridula*, but all populations intergrade, and plain-backed and streak-backed birds breed together in some areas; further, although some variation in cytochrome *b* gene sequences, haplotypes are mixed throughout population with exception of E dune form ("*aridula*"), which also unusual in being the only form with any streaking on flanks. Treated as monotypic.
Distribution. Bushmanland, in NW Northern Cape, South Africa.



Descriptive notes. c. 19 cm (male 5-11% larger than female); male 37-43 g, female 32-38 g. Fairly large, chunky lark with long, heavy tail. Has whitish supercilium, dark loral line, white patch below eye, dark moustachial and malar stripes enclosing white submoustachial stripe; crown and upperparts variable, from plain brick-red (on red sands in R Koa Valley and E around Vanwyksvlei) to browner with variable darker streaking (on shale and clay soils); whitish below, with strongly contrasting large dark brown streaks on breast, rarely extending faintly to flanks ("*aridula*"); eyes brown; bill dark horn, paler base; legs dull flesh-brown. Sexes alike in plumage. Juvenile has white-tipped upperpart feathers with blackish subterminal bars, breast streaks rounder, more diffuse. Voice. Male song, in aerial display or from elevated perch or ground, a stereotyped short series of notes lasting 1·1·5 seconds, "tip tip tip cher-r-r-r", superficially similar to that of *C. albescens* but deeper and slower, and with significant difference in structure, leading notes and, especially, terminal trill more complex, trill typically comprising 3 repeated multi-element notes; regional dialects, but different songs also given at same sites, and one male recorded as singing at least two types; within each bout, each male sings only one song type, with different birds synchronizing types. Also has chittering alarm call, elements of which incorporated into song when male agitated.
Habitat. Sand dunes, including old, stabilized dunes, also clayey, shale-derived soils mostly on alluvial plains. Occurs in dwarf shrublands and vegetated dunes, preferring areas with large-seeded grasses.
Food and Feeding. Wide range of invertebrates, including beetles (Coleoptera), caterpillars, grasshoppers (Acrididae), ants, termites (Isoptera), spiders, ticks (Acarina); also seeds of grasses and other plants; fruits sometimes taken from bushes. Prefers large, smooth seeds; those of grasses make up only 27% of seeds consumed. At one nest, bagworm caterpillars formed almost half of the items fed to chicks; parents removed these from the silken sheaths by beating and shaking them. Feeds on ground; frequently digs in the ground with its heavy bill, but also picks food from soil surface or from vegetation. Not recorded as drinking water.
Breeding. Nesting records scattered through year, with peaks in Aug-Oct in W and Mar-May in E. Territorial and monogamous; occurs in pairs and male sings throughout year. Male performs song flight with heavy, fluttering beats, often with trailing legs, 10-20 m above territory. Nest a cup lined with dry grass leaves and seed awns, with partial or complete domed roof, once including moulted reptile skin, well concealed on ground at base of a grass tuft. Clutch 2-3 eggs; incubation period not known; parents circumspect when approaching nest, land 10-20 m away and walk up to it; chicks brooded by female when small, fed by both parents, food delivered 8 times per hour in early morning; fledging period unknown.
Movements. Resident, but at least some local movement, possibly by immatures, indicated by occasional records outside its normal restricted range, e.g. two specimens collected in adjacent S Namibia.
Status and Conservation. VULNERABLE. Scarce to uncommon or locally common. Patchily distributed within a small range covering maximum area of 72,000 km^2. Average density estimated at 1 pair/30 ha, giving total population of 9400 individuals; decreasing, primarily as a result of habitat loss caused by overgrazing by livestock, especially in sensitive dune fields; has disappeared from dunes where grazing by cattle has removed grass cover. Those inhabiting the E dune fields around Vanwyksvlei form the most distinctive population and are probably the most severely threatened, having disappeared from several areas. Nevertheless, it remains locally common in some areas, with singing males defending territories of less than 10 ha in favoured habitat. Signifi-

cant populations are protected in private reserves, notably the Black Mountain Mine Nature Reserve (800 pairs), Mattheusgat Conservation Area (250 pairs) and Bitterputs Conservation Area (200 pairs). Conservation targets include the promotion of beneficial farming practices and the monitoring of grazing pressure in core areas of its range.

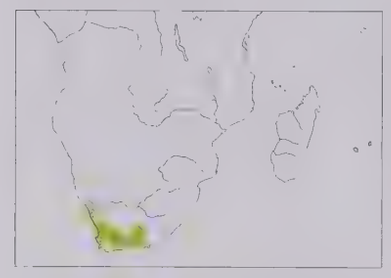
Bibliography. Barnes (2000), Brooke (1984b), Collar & Stuart (1985), Collar *et al.* (1994), Crowe *et al.* (1994), Dean, W.R.J. (1989b), Dean, W.R.J. *et al.* (1991), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Evans (2000b), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Keith *et al.* (1992), Lawson (1961), Mackworth-Praed & Grant (1962), Maclean (1993a), Myburgh & Steyn (1989), Ryan & Bloomer (1997), Ryan *et al.* (1998), Sinclair & Hockey (1996), Stattersfield & Capper (2000), Tarboton (2001).

35. Karoo Lark

Calendulauda albescens

French: Alouette du Karroo **German**: Karoolerche **Spanish**: Alondra del Karoo

Taxonomy. *Alauda albescens* Lafresnaye, 1839, Blouberg, Cape Town, South Africa.
Forms a superspecies with *C. burra*, *C. barlowi* and *C. erythrochlamys*, and is basal within this group. Hybridizes with *C. barlowi* in NW of range (narrow zone between Port Nolloth and R Orange). Geographical variation marked in Northern Cape, with switch from coastal race *codea* to inland *guttata* remarkably sharp (complete replacement within a few kilometres) and few intermediates; otherwise, clinal variation between races broad in some areas; other named taxa are *saldanhae*, which is an intergrade between nominate and *guttata*, and *calviniensis*, which is intermediate between latter and *karruensis*. Four subspecies recognized.
Subspecies and Distribution.
C. a. codea (A. Smith, 1843) - Port Nolloth S to Elands Bay, in NW South Africa.
C. a. albescens (Lafresnaye, 1839) - Saldanha Bay S to Cape Town.
C. a. guttata (Lafresnaye, 1839) - W parts (except coastal areas) of Northern Cape (S from Richtersveld) and Western Cape.
C. a. karruensis Roberts, 1936 - C Karoo.



Descriptive notes. c. 17 cm (male 3-7% larger); male 27-33 g, female 25-29 g. Medium-sized lark with slender, slightly decurved bill and relatively long tail. Nominate race has white supercilium, dark loral line, white area around eye, narrow black malar streak; crown and upperparts grey-brown, heavily streaked dark; wings and tail dark brown, wings with narrow buff edges, outer pair of rectrices with very narrow pale outer edge; white below, heavily streaked blackish from breast to upper belly, narrower streaks on flanks; eyes brown; bill dark horn, with paler base; legs dull pinkish-horn. Distinguished from similar *C. barlowi* mainly by much heavier streaking, also smaller size, with more delicate head and bill. Sexes alike in plumage. Juvenile has upperpart feathers tipped pale cream with dark brown subterminal bars, breast streaks more rounded and diffuse. Races differ primarily in upperpart coloration, richer inland (varying to match soil colour): *codea* is more sandy-grey above than nominate; *guttata* is rufous; *karruensis* is rich chocolate-brown. Voice. Male song, in aerial display or from prominent perch or ground, a repeated, stereotyped phrase of 2-5 staccato notes followed by rather buzzy trill, "tip tip tip zree trrrrr", varies regionally but always faster and higher-pitched than those of other members of superspecies; duration 1·1·5 seconds, shorter than *C. barlowi* and *C. erythrochlamys*, and with two distinct components in terminal trill; where studied, several song varieties at a site, with most males using same song at once. Both sexes also utter shorter "eezer eeit" call, in flight or from perch, and low-pitched chittering alarm from ground or low bush.
Habitat. Inhabits shrubland and well-vegetated dunes, usually on sandy soils. Occurs in coastal strandveld, arid fynbos and karoo scrub, but typically absent from sand-plain fynbos. Generally avoids rocky areas, but found in small sandy pockets among rock outcrops. In area of range overlap with *C. barlowi*, present species occurs in areas with denser, taller vegetation than those inhabited by that species.
Food and Feeding. Diet mostly insects, including grasshoppers (Acrididae), caterpillars, beetles (Coleoptera), termites (Isoptera), mantids, bugs (Hemiptera), dipteran larvae and ants; also spiders, and even snails; also takes seeds, fruits and flowers, occasionally also fruit from low bushes. Grass seeds make up only 13% of seeds consumed. Feeds on ground, digging vigorously in sand with its bill, or gleaning insects from vegetation. Feeds on termites at fresh aardvark (*Orycteropus afer*) diggings. Not recorded as drinking water.
Breeding. Nests in Jul-Nov; may not breed at all in dry years. Territorial and monogamous; male sings throughout year, but mostly in spring breeding season. Male has protracted aerial display 10-30 m above territory, with flight heavy and fluttering, often with legs trailing. Nest built by female, cup-shaped, usually with partial or complete domed roof and side entrance, lined with dry grass and other vegetation, including cotton-like seeds of *Eriocephalus*, placed in depression in ground at base of a bush or grass tuft. Clutch 2-3 eggs (mean 2·6); no data on incubation period; chicks fed by both parents, with insects, leave nest before able to fly, seeking shelter in vegetation; no information on fledging period.
Movements. Resident.
Status and Conservation. Not globally threatened. Common, especially in W of its range. Although coastal populations have suffered loss of habitat through resort development and diamond-mining activities, they remain abundant. Inland populations may have been adversely affected by overgrazing, because they favour areas with more cover; they have lost habitat to crop-farming along dry watercourses in the Karoo.

Bibliography. Cohen (1999), Crowe *et al.* (1994), Dean (1997), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Keith *et al.* (1992), Lawson (1961), Macdonald (1953), MacGregor & Feely (1952), Mackworth-Praed & Grant (1962), Maclean (1993a), Ryan, P.G. (1996), Ryan, P.G. & Bloomer (1997), Ryan, P.G. *et al.* (1998), Sinclair & Hockey (1996), Tarboton (2001), Vincent (1946), White (1957b).

36. Barlow's Lark

Calendulauda barlowi

French: Alouette de Barlow **German**: Barlowlerche **Spanish**: Alondra de Barlow

Taxonomy. *Pseudammomanes barlowi* Roberts, 1937, 8 miles [c. 13 km] west of Aus, Namibia.
Forms a superspecies with *C. burra*, *C. albescens* and *C. erythrochlamys*; sister-species to last of those, with no known range overlap between the two. Recently split from *C. albescens* on grounds of genetic, morphological and vocal evidence; hybridizes with it in S of range (narrow zone between R Orange and Port Nolloth). Geographical variation linked to soil type (pale sands on coast, redder inland); differentiation marked in SW of range, with coastal *patae* replaced by inland *cavei* over distance of just a few kilometres and intermediates scarce; nominate intergrades with latter race. Three subspecies recognized.
Subspecies and Distribution.
C. b. barlowi (Roberts, 1937) - SW Namibia from S of R Koichab (inland of Lüderitz) E to Aus.
C. b. patae (Macdonald, 1953) - coastal sands from SW Namibia (Lüderitz) to extreme NW South Africa (Port Nolloth).
C. b. cavei (Macdonald, 1953) - inland part of coastal plain from extreme SW Namibia (S from Aus) to NW South Africa (R Holgat).



Descriptive notes. 18 cm (male 4-8% larger but 14% longer-billed than female); male 27-36 g, female 25-31 g. Medium-sized lark with relatively large head and long bill. Nominate race has whitish supercilium and area around eye, dark loral line, narrow dark malar streak; rufous above, lightly streaked darker; brown wings and tail, broad sandy margins of tertials and central rectrices; white below, breast spotted brown; eyes brown; bill dark horn-grey above, slightly paler below; legs dull pinkish-brown. Distinguished from superficially similar *C. albescens* by plain flanks and less streaking above, larger size, appreciably longer bill (especially male), also bigger-headed appearance, with thicker "bull-neck"; from *C. erythrochlamys* by shorter legs, more streaked upperparts, brown (not rufous) breast spots. Sexes alike in plumage. Juvenile has cream-tipped upperpart feathers and more diffuse breast spots. Race *cavei* is darker and more heavily streaked than nominate; *patae* is pale sandy-grey above (matching colour of pale coastal sands). Voice. Male song lasting 1·5-2 seconds, 6-9 leading notes and a simple, rapid terminal trill, intermediate in length and structure between those of *C. albescens* and *C. erythrochlamys* but pitch significantly lower and trill rate slower than both; immediately N of R Orange, males also give peculiar "rattle song", which has no obvious homologues in other species. Both sexes have variety of other calls, including a rattle alarm.
Habitat. Sandy plains with dwarf shrublands and grassy dunes, favouring more open and shorter vegetation than that preferred by *C. albescens*. Closely associated with *Euphorbia gummifera* throughout much of range.
Food and Feeding. Insects and seeds. Forages on ground, digging in soft sand with its bill, or gleaning prey from sand surface or from vegetation. Not known to drink water. Shelters in shade of bushes during hottest part of day.
Breeding. Little known. Nests with eggs found in Oct, and displays observed chiefly in Aug-Nov; apparently does not breed every year, e.g. very little singing activity and no evidence of breeding in area S of R Orange in exceptionally dry year of 1998. Monogamous and territorial. Only two nests found, domed cup placed in shallow depression in ground at base of bush or grass tuft. Clutch 2 eggs; no data on incubation and fledging periods, although likely to be much as for *C. erythrochlamys*.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common in areas with adequate vegetation cover. Has maximum range of only 18,000 km², most of which falls within restricted-access zones, set aside as buffers to protect coastal diamond-mining areas on each side of R Orange mouth; this currently affords the species high levels of protection, but, as diamond resources become exhausted, there is increasing pressue to open these areas for grazing by small stock. Has disappeared from some areas near Aus, apparently as a result of overgrazing.

Bibliography. Anon. (1997d, 1999c), Barnes (2000), Bridgeford *et al.* (2000), Cohen (1999), Fishpool & Evans (2001), Harrison *et al.* (1997), Keith *et al.* (1992), Lawson (1961), Macdonald (1953), Mackworth-Praed & Grant (1962), Maclean (1957), Ryan, P.G. (1996), Ryan, P.G. *et al.* (1998), Sinclair & Hockey (1996), Sinclair & Ryan (2003), Tarboton (2001).

37. Dune Lark

Calendulauda erythrochlamys

French: Alouette à dos roux **German**: Rotdünenlerche **Spanish**: Alondra de las Dunas
Other common names: Aristida Lark, Red-backed Lark

Taxonomy. *Alauda erythrochlamys* Strickland, 1853, near Walvis Bay, Damaraland, Namibia.
Forms a superspecies with *C. burra*, *C. albescens* and *C. barlowi*; is sister-species to last of those, and no known range overlap between the two. Monotypic.
Distribution. WC Namibia: between R Kuiseb (Walvis Bay) and R Koichab (Lüderitz).



Descriptive notes. 17-18 cm (male 4-8% larger but 19% longer-billed); male 26-33 g, female 25-29 g. Long-legged, medium-sized lark with relatively plain plumage. Has whitish supercilium and area around eye, dark loral line, narrow dark malar streak; sandy rufous above, minimal streaking, tertials and central tail feathers typically with dark central streaks limited to feather shaft; off-white below, a few small pale sandy-rufous streaks on breast; eyes brown; bill horn-coloured with darker upper half of maxilla, paler base; legs dull pink-brown. Distinguished from very similar *C. barlowi* by on average longer legs and shorter bill, almost unstreaked upperparts, fewer, smaller and paler breast streaks. Sexes alike in plumage. Juvenile has pale buff feather tips on upperparts and more prominent breast spots. Voice. Male song, during aerial display or from ground or a bush, distinctive, a long series of 10-13 simple notes followed by brief whistle and then rapid trill, duration 2-2·5 seconds; typically, more leading notes than songs of other taxa in the superspecies. Male also utters shorter series when nesting. Both sexes give rattling contact or alarm call.
Habitat. Restricted to the Namib dune system and adjacent sandy riverbeds. Usually found in areas with at least some vegetation, notably *Stipagrostis* grasses and naras melons (*Acanthosicyos*

horridus), reaching greatest densities in dry riverbeds. Roosts in grass clumps on upper dune slopes at night and during hot part of the day.

Food and Feeding. Diet a mix of insects, spiders and seeds. Insects include ants, termites (Isoptera), grasshoppers (Acrididae), beetles (Coleoptera), caterpillars; seldom takes the conspicuous and aggressive ant *Camponotus detritus*. Feeds on the ground, with running strides of up to 19 cm; maximum stride-length increased with increasing sand temperature. Searches base of vegetation clumps, reaching up to glean insects, and lands on grass tufts to dislodge seeds. Often digs in the sand with its bill, making small craters. Also recorded as leaping upwards or even undertaking brief hawking flights to catch insect prey. Most foraging in morning and late afternoon, pair-members typically remaining close together. At one site, foraging follows predictable pattern, with birds taking insects on dune slopes, then digging for seeds in inter-dune slacks; this pattern was not altered despite 6 years of drought which significantly reduced density of seeds (although lark density decreased over this drought period). Average field metabolic rate (estimated by using doubly labelled water) 97 kJ/day for males and 88 kJ/day for females; both basal metabolic rate and daily energy expenditure are typical for a bird of this size, suggesting that species has not reduced activity levels to cope with extremely arid environment. The high basal metabolic rate may be needed to counter cold weather in winter, although total evaporative water loss is less than expected for a mid-sized passerine. Most of its water requirements apparently obtained from food, as it rarely visits water to drink. Daily water influx estimated to be 5·6 g; this can readily be met with diet of insects, which would supply 10 g of preformed water, but not with seeds (only 0·8 g); diet of c. 20-30% insects required to meet daily water budget, through combination of preformed and metabolic water, without resorting to other water sources. Circumstantial evidence that proportion of insects in diet increases in summer months, when water demands higher.

Breeding. Breeds opportunistically, after rain; recorded virtually throughout year, but mostly Jan-Apr; normally regarded as double-brooded, but may raise 1-4 broods. Monogamous and territorial. Male sings throughout year, but mostly in association with breeding activity, in aerial display or from elevated perch, occasionally from ground. Nest built by female, taking 7-9 days, at base of a grass tuft or other vegetation, a deep cup usually thickly lined with grasses, other vegetation and sometimes hair, feathers or reptile skin, often held together with spider webs, typically domed, with side entrance usually facing S or E (presumably to avoid excessive heat). Clutch 1-2 eggs (mean 1·9); usually re-lays after breeding failure, often recycling material from old nest to build new one; incubation solely by female, starting when clutch complete, period 13-14 days, incubation fairly costly activity as female energy expenditure virtually identical to that when brood-feeding; chicks fed by both parents, with insects, 14 feeds per hour for small chicks, four per hour for larger ones, nestling's feathers break out of sheaths on day 7, fully feathered by 11-12 days (traces of down still present); at end of chick-rearing period female does slightly more work than male, increasing her food intake by 64% (compared with 58% for male); young leave nest after 12-14 days, barely able to flutter, remain hidden in vegetation. Breeding success fairly low: in one study 0·38 fledglings per nest (61% of eggs hatched, 45% of chicks fledged), in another study only one of 13 pairs fledged young. Recorded longevity 6 years.

Movements. Resident; three individuals were retrapped after 5-6 years at same locality as that where first ringed as adults.

Status and Conservation. Not globally threatened. Locally fairly common, but always at relatively low densities. Patchily distributed; linked to distribution of vegetated dunes, and has relatively small total range. The species is afforded a high level of protection, however, because virtually its entire range falls within the Namib-Naukluft National Park.

Bibliography. Boyer (1988), Bridgeford *et al.* (2000), Cox (1983), Crowe *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Keith *et al.* (1992), Lawson (1961), Mackworth-Praed & Grant (1962), Maclean (1993a), Pollard (1998), Ryan, P.G. (1996), Ryan, P.G. *et al.* (1998), Safriel (1990), Schippers *et al.* (2001), Sinclair & Hockey (1996), Tarboton (2001), Williams (1992, 1998, 1999, 2001), Willoughby (1971).



PLATE 56

inches 4

cm 10

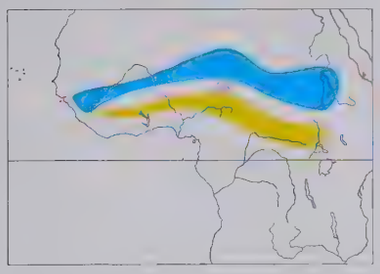
Genus *PINAROCORYS* Shelley, 1902

38. **Rufous-rumped Lark**

Pinarocorys erythropygia

French: Alouette à queue rousse **German**: Rotbürzellerche **Spanish**: Alondra Colirrufa
Other common names: Rufous-rumped Bushlark, Red-tailed Lark

Taxonomy. *Alauda erythropygia* Strickland, 1852, Kordofan, Sudan.
Often placed in genus *Mirafra*, but distinctive in terms of structure, plumage (including slight sexual dimorphism) and migratory behaviour; no genetic material has been sequenced. Forms a superspecies with *P. nigricans*, and sometimes considered conspecific. Monotypic.
Distribution. Breeds in savannas from N Ivory Coast E to S Sudan and N Uganda; migrates N & NW to Sahel and arid savanna from Sierra Leone E to N Niger, N Chad and NC Sudan.



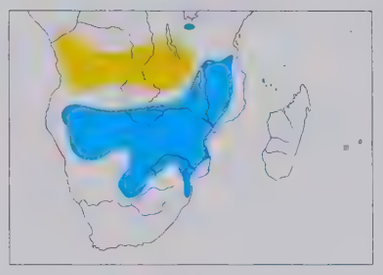
Descriptive notes. 18 cm; 30 g. Distinctive, medium-large, slender, thrush-like lark with striking facial pattern; frequently dangles its legs in flight. Has supercilium and most of face whitish, dark brown eyestripe, rear ear-coverts, malar stripe and line through cheek; crown and upperparts very dark brown, rump and upper-tail-coverts rufous; primaries edged rufous, secondaries tipped rufous, outer tail rufous; wing feathers with prominent pale edges in fresh plumage; whitish below, flanks and vent washed rufous, breast boldly streaked dark brown; eyes dark brown; bill dark horn, yellowish base of lower mandible; legs pinkish-white. Differs from *P. nigricans* in slightly smaller size, prominent rufous rump and outer tail, rufous-washed lower underparts. Female resembles male, but more rufous on primaries. Juvenile is paler above, with paler rufous feather fringes, underparts washed buff with less prominent streaking. Voice. Male song, in aerial display, a series of piping whistles, "tseoo tseoo" or "tsit-tseoo tsit-tseoo", with occasional buzzy trills; flight call a dry "wree".
Habitat. Breeds in open broadleaf woodland and savanna; mostly in more arid savanna in non-breeding period (May-Sept). Also occurs in fields and open cultivated lands. Attracted to recently burnt areas, where sometimes hundreds gather within hours of a fire.
Food and Feeding. Insects, including grasshoppers (Acrididae). Forages mostly on ground; runs from one spot to another. Often perches on top of a tree when flushed.
Breeding. Little known. Breeds in Dec-Feb. Probably monogamous; territorial. Male sings during aerial display, rising from perch on tree, usually remaining in air for only a few minutes. One nest was in natural depression in side of an earth bank in area of recently burnt grassland, the floor and sides of the hole thinly lined with fibres and burnt grass stems; another was described as sited among grass tufts near a small pool. Clutch 2 eggs; an adult flushed from one nest feigned injury to distract the intruder; no information on parental duties or incubation and fledging periods.
Movements. Intra-African migrant. Typically breeds in more mesic habitats in S of range during Oct-Apr dry season, then migrates N to more arid savannas during May-Sept rainy season. Movements not fully understood, however; some may be resident, e.g. in N Nigeria. Vagrant in Gambia.
Status and Conservation. Not globally threatened. Locally fairly common. Its occurrence in many parts of range is rather erratic from one year to another. A rather poorly known species.
Bibliography. Bannerman (1953), Borrow & Demey (2001), Butler (1905, 1908), Byaruhanga *et al.* (2001), Dean (1979), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Grimes (1987), Keith *et al.* (1992), Mackworth-Praed & Grant (1960, 1970), Nikolaus (1987), Salvan (1968), Serle (1957), Short *et al.* (1990), Stevenson & Fanshawe (2002).

39. **Dusky Lark**

Pinarocorys nigricans

French: Alouette brune **German**: Drosslerche **Spanish**: Alondra Oscura

Taxonomy. *Alauda nigricans* Sundevall, 1850, Aapies River, Pretoria, South Africa.
Often placed in genus *Mirafra*, but distinctive in terms of structure, plumage (including sexual dimorphism) and migratory behaviour; no genetic material has been sequenced. Forms a superspecies with *P. erythropygia*, and sometimes considered conspecific. Two subspecies recognized.
Subspecies and Distribution.
P. n. occidentis Clancey, 1968 - breeds SW DRCongo and N Angola; migrates S as far as Namibia and Mozambique.
P. n. nigricans (Sundevall, 1850) - breeds SE DRCongo, SW Tanzania and NW Zambia; migrates S as far as Namibia and Mozambique.
Descriptive notes. 19-20 cm; male 30-46 g, female 31-41 g. Large, slender, thrush-like lark with striking facial pattern, very dark upperparts and boldly streaked breast. Male has whitish supercilium, circumorbital area, cheek, neck side and moustachial stripe, dark eyestripe, ear-coverts, line through cheek and malar streak; crown and upperparts blackish-brown, prominent pale edges of wing feathers in fresh plumage; whitish below, breast boldly streaked blackish-brown; eyes dark brown; bill dark horn, paler yellow-horn base of lower mandible; legs whitish. Differs from *P. erythropygia* in larger size, dark brown rump and outer tail; most closely resembles Groundscraper Thrush (*Psopocichla litsipsirupa*), but is smaller, with scaled wing-coverts, no pale wingbar in flight. Female differs from male in having less boldly patterned face, is less blackish above, more buffy (less white) below, breast streaks not so dark. Juvenile is browner above, with buffy edges of back and wing feathers, buff-washed underparts with less prominent streaking. Race *occidentis* differs from nominate in having less marked breast streaking, appearing paler below. Voice. Male song, in flight, a rather tuneless, burry "zhreeep" or "drree-up".



Habitat. Breeds in miombo woodland and *Uapaca* savanna, typically where there is rather little ground cover, often in recently burnt woodland; also occurs in short open grassland and in burnt areas on its breeding grounds. In non-breeding season found in more arid woodland and savanna, occupying a wide range of open habitats, including bare fields and roadsides.
Food and Feeding. Mostly insects, a few seeds. Insect prey include both worker and alate termites (Isoptera), beetles (Coleoptera), grasshoppers (Acrididae) and ants. Feeds mostly on the ground. While walking, frequently pauses and flicks open its wings, which has been suggested to aid in flushing insects.
Breeding. Breeds in dry season, Aug-Oct. Singing male displays over territory of c. 2·5 ha. Nest a deep cavity, probably excavated by the bird itself, in side of an earth clod or exposed base of a grass tuft, thinly lined with coarse grass stems, large pieces of bark liberally strewn over area within radius of 0·5 m of nest; both nests found in Angola faced S. Clutch 2 eggs; chicks fed by both parents, which are extremely wary around nest, flying up to top of nearby tree if disturbed; incubation and fledging periods unknown.
Movements. Inter-African migrant. After breeding in C Africa in Jul-Oct dry season, disperses S & E into more open habitats in association with arrival of summer rains. Non-breeding range extends from S Angola across to S Tanzania, and S to C Namibia, N & NE South Africa and S Mozambique; both races occur together on non-breeding grounds. Migrates in small flocks. Most records in South Africa during Dec-Apr, although birds arrive as early as Oct and some remain as late as Jun; farther N in S parts of Africa, distinct peaks in reporting rates in Nov-Dec and Apr-May, presumably linked to passage of migrants; much more marked peak in reporting rates during return migration N in Apr-May suggests that this passage is more synchronized. Periodic irruptions into areas where species seldom occurs in most years. Recent discovery of significant numbers of non-breeding individuals S of L Victoria (in N Tanzania) suggests that post-breeding dispersal also oriented NE.
Status and Conservation. Not globally threatened. Locally common; numbers vary from one year to another in some areas. Rather irregular in many parts of non-breeding range. Despite early reports of breeding S of R Zambezi, most evidence points to breeding being confined to C Africa N of Zambezi; alleged record of nest with 3 eggs in Zululand in Oct not substantiated.
Bibliography. Benson (1959), Benson *et al.* (1971), Clancey (1964b, 1968c), Dean (1974, 2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Jones (1997a), Keith *et al.* (1992), Mackworth-Praed & Grant (1960, 1962, 1970), Maclean (1993a), Martin (1972), Penry (1994), Shaw (1978), Short *et al.* (1990), Sinclair & Hockey (1996), Stevenson & Fanshawe (2002), Tyler (1998), Zimmerman *et al.* (1996).

Genus *AMMOMANOPSIS* Bianchi, 1904

40. **Gray's Lark**

Ammomanopsis grayi

French: Ammomane de Gray **German**: Namiblerche **Spanish**: Alondra de Gray
Other common names: Gray's Sand Lark

Taxonomy. *Alauda grayi* Wahlberg, 1855, between Kuiseb and Swakop Rivers, Damaraland, Namibia.
Traditionally placed in genus *Ammomanes* and in the past thought to form a superspecies with *A. deserti*, but apparent similarities now attributed to convergence. Genetic evidence indicates that it is much closer to *Certhilauda* and *Chersomanes*. Upperpart coloration closely linked to soil colour, darker in N; pale birds reappear on whitish sands in far N of range (S to extreme NW Namibia), may represent an undescribed taxon. Two subspecies recognized.
Subspecies and Distribution.
A. g. hoeschi (Niethammer, 1955) - coastal plain of SW Angola and NW Namibia (S to Cape Cross).
A. g. grayi (Wahlberg, 1855) - coastal plain of C & S Namibia.



Descriptive notes. 14 cm; male 19-27 g, female 17-23 g. Peculiar, compact desert lark with plain, unstreaked plumage, only slight hint of paler supercilium and darker eyestripe; stubby bill. Nominate race is pale sandy brown above, flight-feathers only slightly darker than wing-coverts; central tail feathers pale like back, remainder dark brown with white bases and narrow tips (distinctive in flight); underparts whitish, a few faint streaks on breast side; eyes brown; bill yellowish to pale bluish-grey, darker tip; legs flesh-grey. Differs from *Spizocorys starki* and female *Eremopterix verticalis* in much plainer plumage; distinguished from similar pale desert race of Tractrac Chat (*Cercomela tractrac*) by much heavier bill, shorter legs, completely different stance and gait. Sexes alike. Juvenile has paler feather fringes above (looks slightly scaled), breast lightly mottled, mostly at sides. Race *hoeschi* is darker than nominate, grey-brown above. Voice. Male song, from ground or in display-flight, mostly before dawn or after dusk, a strange, very high-pitched series of short calls and ascending whistle, "tink

On following pages: 41. Spike-heeled Lark (*Chersomanes albofasciata*); 42. Beesley's Lark (*Chersomanes beesleyi*); 43. Cape Long-billed Lark (*Certhilauda curvirostris*); 44. Agulhas Long-billed Lark (*Certhilauda brevirostris*); 45. Eastern Long-billed Lark (*Certhilauda semitorquata*); 46. Karoo Long-billed Lark (*Certhilauda subcoronata*); 47. Benguela Long-billed Lark (*Certhilauda benguelensis*); 48. Short-clawed Lark (*Certhilauda chuana*); 49. Greater Hoopoe-lark (*Alaemon alaudipes*); 50. Lesser Hoopoe-lark (*Alaemon hamertoni*); 51. Dupont's Lark (*Chersophilus duponti*).

tink tink wheeeeeer tink tink", and various short whistles, typically ascending in pitch. Contact calls include soft "tew" and series of 3 piping notes.
Habitat. Gravel plains, clayey soils and saltflats with little or no vegetation other than scattered grass clumps or patches of succulents; avoids drifting sands.
Food and Feeding. Seeds, mostly of *Stipagrostis* grasses and various desert forbs, and other vegetable matter; also insects, including *Hodotermes* termites, ants, beetles (Coleoptera), grasshoppers (Acrididae), moths (Lepidoptera), flies (Diptera) and stick-insects (Phasmida); also arachnids (spiders and solifugids). In one study, seeds made up 56% of diet, invertebrates 43% and green vegetable matter 1%. Typically forages with crouched, finch-like posture. Picks food from ground surface, or digs with the bill; also pulls at grass stems to expose the soft bases, which are then eaten. Seldom drinks water, apparently obtaining sufficient water from its food. Seeks shelter from heat by entering rodent burrows; or loses heat by standing on raised rocks or sticks with wings held away from body, and facing into wind. In small groups, usually of 3-4 individuals, during most of year, but up to 130 on occasion.
Breeding. Breeds mostly in Mar-Jun, in association with peak in late-summer rains, but scattered records throughout year suggest that breeding at least partly opportunistic, following local rain events. Breeds mostly in pairs, sometimes co-operatively, e.g. 3 birds feeding a fledged chick; solitary, but several pairs may nest fairly close together. Male has relatively low, undulating display-flight, with wing-whirring preceding vocalizations. Nest in deep hollow in ground, typically lined with thick, insulating mat of fine grasses and grass seedheads (in one case virtually no lining), usually surrounded by narrow "apron" of small stones, which also line nest scrape; often situated on S or SE side of a rock or a grass tuft, which shades nest during hottest time of day; on open plains, nest cup so deep that incubating bird, back of which is level with ground surface, is almost invisible. Clutch 2-3 eggs (mean 2·4); incubation period 12-13 days; chicks fed by both parents, leave nest after c. 10 days, before capable of flight.
Movements. Rather mobile on a very local scale; no evidence of systematic movements. Somewhat nomadic, with groups wandering widely over open plains; gathers in flocks in response to rain events, but never attains the spectacular concentrations of nomadic seed-eating species such as *Eremopterix verticalis*, *Spizocorys starki* or Lark-like Bunting (*Emberiza impetuani*).
Status and Conservation. Not globally threatened. Locally common. Most abundant in E part of the Namib, but occurs W all the way to the coast where suitable habitat available. A large proportion of the species' range is in formally protected areas.
Bibliography. Bridgeford *et al.* (2000), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Hoesch (1958), Keith *et al.* (1992), Mackworth-Praed & Grant (1962), Maclean (1993a), Niethammer (1969), Sinclair & Hockey (1996), Sinclair & Ryan (2003), Tarboton (2001), Willoughby (1971).

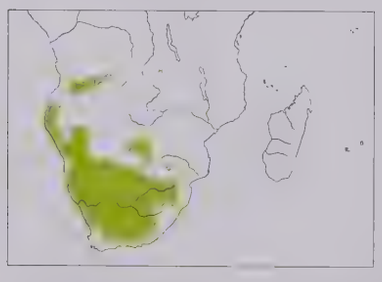
Genus *CHERSOMANES* Cabanis, 1851

41. Spike-heeled Lark

Chersomanes albofasciata

French: Alouette éperonnée **German**: Zirplerche **Spanish**: Alondra Espolada

Taxonomy. *Certhilauda albofasciata* Lafresnaye, 1836, Deelfontein, Northern Cape, South Africa.
Forms a superspecies with *C. beesleyi*; usually considered conspecific, but genetically distinct, widely separated geographically, and lacks sexual plumage dimorphism. Genetic data indicate that N populations are basal, and that, within South Africa, W (coastal) and E (grassland) populations are more closely related to each other than to Karoo populations. Geographical variation mostly in plumage coloration, with fine-scale differences linked to changes in soil colour, resulting in numerous races having been described; differences among many contiguous forms broadly clinal, and further study may demonstrate that several of listed races are unsustainable. Other named races include *longispina* from Angola (W Huíla), synonymized with *obscurata*; *bathoeni* from SE Botswana, merged with *kalahariae*; *bradfieldi* from Great Namaqualand (Langklip), merged with *arenaria*; from W to E in South Africa, *bushmanensis* and *meinertzhageni* are considered synonymous with *garrula*, *baddeleyi* with nominate, *robertsi* and *subpallida* with *alticola*, and *latimerae* with *macdonaldi*. Isolated population in SE DRCongo not yet ascribed to any named race. Ten subspecies recognized.
Subspecies and Distribution.
C. a. obscurata (Hartert, 1907) - SW, C & NE Angola (C plateau, and S Bengula S to Namibe).
C. a. boweni (Meyer de Schauensee, 1931) - NW Namibia.
C. a. erikssoni (Hartert, 1907) - N Namibia.
C. a. barlowi (C. M. N. White, 1961) - NE Botswana.
C. a. arenaria (Reichenow, 1904) - S Namibia and SW South Africa (S to NW & C Karoo).
C. a. garrula (A. Smith, 1846) - W South Africa (Western Cape).
C. a. kalahariae (Ogilvie-Grant, 1912) - C Botswana and N South Africa.
C. a. albofasciata (Lafresnaye, 1836) - SE Botswana and C South Africa.
C. a. alticola Roberts, 1932 - NE South Africa.
C. a. macdonaldi (Winterbottom, 1958) - S South Africa (SE Karoo).



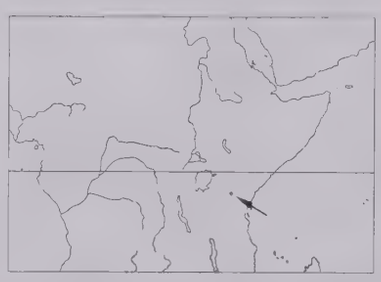
Descriptive notes. 13-14 cm; male 23-34 g, female 20-27 g. Very distinctive lark, with upright posture, slender decurved bill, and short tail with prominent white tips; hind claw remarkably long and straight. Nominate race has buffish supercilium and circumorbital ring, pale rufous-brown ear-coverts; blackish-streaked rufous-brown above, browner or greyer on neck, back feathers with broad dark centres and buff-white tips; wings dark brown, edged buffish; tail dark brown, broadly tipped white (except central rectrices); throat white, contrasting with light rufous-brown to cinnamon underparts, breast sometimes with some darker streaking or mottling (often lacking); eyes brown; bill dark horn above, paler below; legs whitish to pinkish-brown or plumbeous grey. Sexes alike in plumage, female on average smaller and shorter-billed (no overlap in bill length). Juvenile has crown and back feathers tipped white or buff, white-fringed wing-coverts, indistinct dark mottling on breast. Races differ considerably in plumage coloration, generally darker and more rufous in E, becoming paler sandy or ash-grey in arid W; *alticola* is darker than nominate above, light yellowish-brown below; *macdonaldi* is dark and grey-tinged above, greyish below; *garrula* is darker than previous, upperparts well marked with blackish, browner below; *kalahariae* is pale sandy above, pale below; *erikssoni* is greyer and more streaked than previous; *barlowi* is greyer and less streaked than last, paler below, usually fine dark breast streaks; *arenaria* is yellowish-rufous above, streaks narrower, pale below; *boweni* is plain pinkish-sandy above, pale below; *obscurata* is dark, back feathers with very broad black centres and reddish edges, deep rufous underparts. Voice. Typical call a dry trill, "trrri-trrri-trrri-trrr", like that of a plover (Charadriidae), appears to function both for contact among group-members and as territorial song; groups respond strongly to playback of call, sometimes producing almost hysterical trilling chorus.
Habitat. Range of open habitats, from montane grassland to arid Karoo shrublands and to semi-desert and desert plains; also, rather isolated populations on fringes of pans, such as Etosha Pan, in Namibia, and L Makgadikgadi, in Botswana. Often associated with mammal burrows.
Food and Feeding. Mostly insects, including termites (Isoptera), beetles (Coleoptera), ants and moths (Lepidoptera), and arachnids (solifugids); some seeds (of grasses and some forbs) also taken. In the Namib, invertebrates comprised 84% of diet and seeds 16%. Marked sexual size dimorphism may be related to its largely insectivorous diet; larger males had higher frequency of beetles in the diet (81%) than did females (25%). In the Karoo, seeds were relatively scarce in the diet, with no grass seeds recorded at all. Not known to visit watering points to drink; all water requirements apparently obtained from food. Usually occurs in groups of 3-10 individuals; often, one stands sentry on a small bush or termite mound while the others forage. When threatened, takes refuge in mammal burrows, where also seeks shelter from the sun in heat of day.
Breeding. Mostly Jul-Dec in South Africa, although in arid areas breeding stimulated by rainfall and can occur in virtually any season; typically later (linked to later rains), Feb-Apr, in Namibia; in the Kalahari and Bushmanland, eggs laid within a week of even very small rain events (less than 10 mm). Breeds mostly in pairs, sometimes co-operatively; in arid W, records of three birds simultaneously bringing food to nest. Male occasionally performs striking aerial display, rises steeply to c. 6 m, hovers briefly while uttering trill, then glides back to ground with wings held slightly below horizontal. Nest, in one case built by a single adult (presumably female) in c. 5 days, a shallow depression in ground, often at base of a bush or grass tuft, lined with dry grass, stems and rootlets; in arid areas, located in sandy site and typically with "apron" of pebbles, earth clods or twigs on open side, and in arid W usually on E or SE side of a bush, providing shade from afternoon sun; nest rim occasionally decorated with sand-encrusted spider webs, as with *Eremopterix australis* nests. Clutch 2-3 eggs, rarely 4 or 5 (mean 2·6); in arid areas clutch size varies with rainfall, average 2 eggs following small showers, 2·8 after moderate rains, and 3·3 after very good rains (when the only clutches of 4 and 5 eggs were recorded); laying interval 1 day, in one case reported as 2 days; incubation sometimes starts with first egg, sometimes delayed until clutch complete, incubation period 12-13 days; chicks fed by both parents, sometimes assisted by helper, parents call softly on approach to nest, alerting chicks to their presence, wait to remove any faecal pellets after feeding, typically run from nest rather than fly away if disturbed; chicks leave nest 8-12 days (usually 11 days) after hatching, before able to fly, cared for by parents for considerable period; terrestrial predators, such as mongooses (Herpestidae), mobbed with hovering display and calling. In arid W high levels of nest predation, primarily by small mammals (especially mongooses), only 41% of clutches survive to due hatching date, 92% of these eggs hatch, and 65% of broods survive to fledging, giving overall breeding success of only 22% and mean of 0·56 young fledged per attempt; in the Kalahari, success was slightly higher, at 34%.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Common throughout most of range. No data available on densities, but pairs and groups defend rather large territories throughout year. Avoids croplands, and has certainly suffered habitat loss in E of its range in South Africa as a result of expansion of agriculture and sylviculture. Adults subject to predation by Red-necked Falcons (*Falco chicquera*) and Common Fiscals (*Lanius collaris*). Isolated population in SE DRCongo virtually unknown, and racial identity not determined; further work required in order to clarify its taxonomy and status.
Bibliography. Clancey (1962, 1964b), Dean (1997, 2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Herremans-Tonnoeyr & Herremans (1993), Keith *et al.* (1992), Kleynhans & Kleynhans (2000), Lloyd (1998, 1999), MacGregor & Feely (1952), Mackworth-Praed & Grant (1962), Maclean (1970a, 1970b, 1974b, 1993a), Penry (1994), Sinclair & Hockey (1996), Steyn (1988), de Swardt (1990b), Tarboton (2001), Tieleman *et al.* (2003), White (1957b), Willoughby (1971), Winterbottom (1958).

42. Beesley's Lark

Chersomanes beesleyi

French: Alouette de Beesley **German**: Beesleylerche **Spanish**: Alondra de Beesley
Other common names: Pygmy Spike-heeled Lark

Taxonomy. *Chersomanes albofasciata beesleyi* Benson, 1966, Masai Plains, north of Arusha, north Tanzania.
Forms a superspecies with *C. albofasciata*; usually considered conspecific, but genetically distinct, widely separated geographically, and exhibits a degree of sexual plumage dimorphism. Monotypic.
Distribution. N Tanzania: area just N of Mt Meru.



Descriptive notes. 11 cm; male 27 g, female 22 g. Very distinctive lark with slender decurved bill, short tail with white tip, upright posture; very long and straight hind claw. Male has whitish supercilium and circumorbital ring, pale rufous ear-coverts; crown and upperparts dark brown with pale feather fringes (colour matching that of local soil, and similar to that of local populations of *Pseudalaemon fremantlii* and *Calandrella somalica*); wings dark brown, edged whitish; tail dark brown with broad white tips (except central rectrices); throat whitish, contrasting with light rufous underparts, breast streaked dark brownish; eyes brown; bill dark horn above, paler below; legs pale pink. Distinguished from similar *C. albofasciata* (especially of race *obscurata*) mainly by heavier streaking on breast, smaller size (wing on average 10% shorter). Female is more richly rufous on belly and has fewer, bolder breast streaks. Juvenile has narrower pale feather fringes on upperpart, larger and more diffuse breast streaks, paler (buff)

belly. Voice. Quite high-pitched, slightly nasal chittering call, similar to that of *C. albofasciata*; twanging chirps by adults delivering food to nest.
Habitat. Short-grass plains with no trees or shrubs, at 1400-1550 m. Apparently restricted to two small areas N of Mt Meru, in the rainshadow of Mt Kilimanjaro, where there are tussock-forming grasses with adequate space between tufts (ground cover c. 50%); avoids stony areas.
Food and Feeding. Stomach contents dominated by beetles (of families Curculionidae, Tenebrionidae and Buprestidae), but also contained caterpillars, a large centipede (Diplopoda) and a seed. Fledged young were fed with caterpillars. Forages on the ground; frequently cocks tail, unlike *C. albofasciata*. Occurs in pairs or small groups throughout year, rarely in groups of up to ten individuals.
Breeding. Breeds during long and short rains, Oct-Dec and Mar-Apr. Chicks recorded as fed by at least two adults, but not known if a co-operative breeder. Nest a shallow cup on ground, lined with dry grass and cow dung. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Because of uncertainty about its taxonomic status, conservation status not formally assessed: likely to be Endangered or even Critical. Entire world population confined to two small areas of less than 10 km^2 in extent, situated c. 30-50 km N of Arusha; neither is protected. A reported sighting from Amboseli, in S Kenya, is disputed. The two areas known to be inhabited by this lark are currently grazed by livestock, which may enhance their suitability for the species by maintaining open areas among tussocks; any change in land-use practices, however, could have disastrous effects.
Bibliography. Beesley (1971), Benson (1966), Benson & Forbes-Watson (1966), Keith *et al.* (1992), Lewis & Pomeroy (1989), Moore (1979), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Turner (1985), Zimmerman *et al.* (1996).

Genus *CERTHILAUDA* Swainson, 1827

43. Cape Long-billed Lark
Certhilauda curvirostris

French: Alouette à long bec **German**: Kap-Langschnabellerche **Spanish**: Alondra de El Cabo
Other common names: Long-billed Lark (when all members of genus except *C. chuana* lumped as one species)

Taxonomy. *Alauda curvirostris* Hermann, 1783, Cape of Good Hope, South Africa.
All members of genus with exception of *C. chuana* formerly treated as a single species, but recent research indicates that they are genetically, morphologically and vocally distinct. Present species and *C. brevirostris* appear to be sister-species (ranges apparently separated by Cape fold mountains, but boundary in Gouda-Tulbagh area not well known), and genetic data suggest that they are closely related to *C. semitorquata*. Range overlaps narrowly with that of *C. subcoronata* in N (on E edge of Namaqualand coastal plain N of Port Nolloth). Bill length increases clinally from N to S, probably linked to softer, sandier substrates in N. Two subspecies recognized.
Subspecies and Distribution.
C. c. falcirostris Reichenow, 1916 - coastal plain from extreme SW Namibia S to W South Africa (S to R Olifants).
C. c. curvirostris (Hermann, 1783) - coastal plain from R Olifants S to Cape Town.



Descriptive notes. 20-24 cm (male on average 12-19% larger than female, with greatest difference in bill length); 40-60 g. Largest lark in S Africa, with long decurved bill, long tail, fairly long legs, narrow pale supercilium and eyering. Nominate race is grey-brown, heavily streaked darker brown, above; white to creamy below, heavy dark streaking on breast, streaks extending less boldly down flanks and belly sides; eyes brown; bill blackish-horn; legs dull pink-brown. Differs from *C. brevirostris* in slightly paler and greyer appearance, larger size, appreciably longer and deeper bill and longer tail. Sexes alike in plumage. Juvenile is browner above, with prominent buff-white tips of feathers, breast more diffusely spotted rufous-brown. Race *falcirostris* is larger, longer-billed and slightly greyer than nominate, with larger, darker and more pronounced teardrop-shaped streaks on breast; distinguished from *C. subcoronata* by cold grey-brown (not rufous) upperparts, white (not creamy) underparts with heavy streaking extending to the flanks. Voice. In S (nominate race), male song, in display-flight or from low perch or ground, "whi-peeeooo", first note much shorter, softer and less far-carrying than second, the initial note shorter and less pronounced than in song of *C. brevirostris*; in N (*falcirostris*), a single, descending whistle, "peeeoooo"; much softer version given while walking or foraging. Also a burry contact call, "irrr-errr".
Habitat. Short coastal scrub (strandveld) and dune vegetation, usually where open areas of sandy soil present. In N of range largely confined to a narrow strip of white coastal dunes. In S occurs widely in extensive cereal fields, but favours fallow fields or recently ploughed or planted lands; in areas with tall, dense crops is largely confined to field edges and roadsides.
Food and Feeding. Diet poorly known; mostly insects, e.g. beetles (Coleoptera) and caterpillars, also a few seeds. Forages by walking on ground, searching at bases of plants, turning over stones and digging in sand and soft soil for larvae and insects.
Breeding. Breeds Aug-Oct. Usually in pairs throughout year. Male sings in all months, at peak intensity in late winter-spring in association with breeding; displaying male flies close to ground, rises near-vertically 10-15 m on closed wings, utters song, then stalls and falls vertically, wings still closed until just before reaching ground, and continues horizontal flight; sometimes 2-3 up-down displays on same flight. Few other details known; clutch 3 eggs.
Movements. Resident.
Status and Conservation. Not globally threatened. Locally common. Occurs always at relatively low densities, c. 1 pair/10 ha. Although much of its coastal habitat in N of range has been disturbed by diamond-mining, it remains common there. In S, population has adapted to intensively farmed croplands, but it tends to occur mostly in fallow fields. Relatively poorly known species; fieldwork required in order to ascertain more about its ecology and breeding biology.
Bibliography. Clancey (1957), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Keith *et al.* (1992), MacGregor & Feely (1952), Mackworth-Praed & Grant (1962), Maclean (1993a, 1999), Ryan & Bloomer (1999), Sinclair & Hockey (1996), Sinclair & Ryan (2003), Uys (1984).

44. Agulhas Long-billed Lark
Certhilauda brevirostris

French: Alouette de l'Agulhas **Spanish**: Alondra de Agulhas
German: Agulhas-Langschnabellerche

Taxonomy. *Certhilauda curvirostris brevirostris* Roberts, 1941, Zoetendalsvlei, Bredasdorp, Western Cape, South Africa.
All members of genus with exception of *C. chuana* formerly treated as a single species, but recent research indicates that they are genetically, morphologically and vocally distinct. Present species and *C. curvirostris* appear to be sister-species (ranges apparently separated by Cape fold mountains, but boundary in Gouda-Tulbagh area not well known), and genetic data suggest that they are closely related to *C. semitorquata*. Possibly overlaps in range with *C. subcoronata* in Breede Valley. Monotypic.
Distribution. Agulhas Plain and Breede Valley, in Western Cape, South Africa.

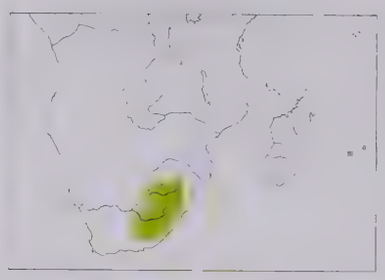


Descriptive notes. 18-21 cm; 35-48 g. Has pale supercilium and eyering; buffish-brown with darker streaks above; pale buffish-white below, dark streaks from breast down to flanks; eyes brown; bill blackish-horn; legs dull pink-brown. Distinguished from *C. curvirostris* by appreciably smaller size, shorter and more slender bill, shorter tail, more buff-brown coloration; from *C. subcoronata* by smaller size, lack of rufous on upperparts, more extensive and uniform streaking, especially on underparts. Sexes alike in plumage, female appreciably smaller. Juvenile has prominent buffy feather tips on upperparts, breast more diffusely spotted. Voice. Male song 2 notes of roughly even duration, "tsuuee peeooo", initial note softer and not so far-carrying as second; sings mostly from dawn until late morning, throughout year. Also burry contact calls.
Habitat. Occurs in fallow fields and recently ploughed fields; appears to avoid areas that are farmed intensively. At edges of range, on less productive soils, occurs also in natural vegetation; favours sandy areas dominated by restios along the coast, and dwarf Karoo shrublands on clay soils in foothills of Breede Valley.
Food and Feeding. Food mostly insects, some seeds. Forages on the ground; sometimes digs with bill, or uses feet to pull at vegetation.
Breeding. Eggs laid in Sept-Oct, young fledge in Oct-Nov. Male aerial display close to ground, then rising and falling vertically 10-15 m on closed wings, calling at peak of ascent; similar to that of *C. curvirostris*. Nest in open cup, usually at base of a small bush or tuft of grass, in some cases rudimentary, with only very thin mat of vegetation lining a depression in ground. Clutch 2-3 eggs (mean 2·7); nothing known about parental duties or incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Fairly common but local. Has very small range, covering maximum of only 15,000 km^2. Much of its range has been transformed for agriculture, to the point where there is ongoing debate as to the nature of original vegetation of area. Although fairly common in pastures and fallow fields, it is patchily distributed across Agulhas Plain; reasons for this unknown. Some concern that changes in land-use practices may adversely affect the population.
Bibliography. Barnes (2000), Harrison *et al.* (1997), Fishpool & Evans (2001), Keith *et al.* (1992), Louw (2000), Macdonald (1952b), MacGregor & Feely (1952), Mackworth-Praed & Grant (1962), Maclean (1993a), Ryan & Bloomer (1999), Sinclair & Ryan (2003), Stattersfield & Capper (2000).

45. Eastern Long-billed Lark
Certhilauda semitorquata

French: Alouette du Transvaal **Spanish**: Alondra de Transvaal
German: Transkei-Langschnabellerche

Taxonomy. *Certhilauda semitorquata* A. Smith, 1836, Orange River (= Colesberg), Northern Cape, South Africa.
All members of genus with exception of *C. chuana* formerly treated as a single species, but recent research indicates that they are genetically, morphologically and vocally distinct. Despite plumage differences, present species most closely related to *C. curvirostris* and *C. brevirostris*; only distantly related to adjacent *C. subcoronata*, ranges abutting over broad distance at karoo-grassland interface (roughly along 24° E longitude). Geographical variation rather clinal. Three subspecies recognized.
Subspecies and Distribution.
C. s. transvaalensis Roberts, 1936 - E South Africa (N Free State, Gauteng, Mpumulanga and N KwaZulu-Natal).
C. s. semitorquata A. Smith, 1836 - E Karoo grasslands of South Africa (Northern Cape, Eastern Cape, Free State, KwaZulu-Natal) and Lesotho.
C. s. algida Quickelberge, 1967 - S part of Eastern Cape.
Descriptive notes. 16-20 cm (male on average 10-14% larger in body measurements, 26% longer bill); 30-48 g. Rather plain plumage, with narrow pale supercilium and eyering; the smallest species in the "*C. curvirostris* complex". Nominate race has crown and upperparts light rufous-brown, only minimally streaked; underparts light buffish, breast faintly streaked and spotted darker; eyes brown; bill blackish-horn; legs dull pink-brown. Differs from *C. subcoronata* in being appreciably smaller and shorter-billed, with less heavy streaking on back and breast. Sexes alike in plumage. Juvenile has prominent buffy feather tips on upperparts, breast more diffusely spotted. Races differ in size, plumage colour and streaking: *transvaalensis* is small, brighter rufous and unstreaked above, only a few small rufous spots on breast, and short, relatively straight bill; *algida* is relatively large, brownish and streaky. Voice. Male song, given throughout year, from favoured rock or in aerial display, a simple, descending "peeoooo", lacking the "inhalation" that precedes song of *C. subcoronata*. Also burry contact calls.



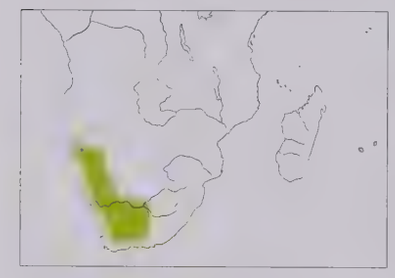
Habitat. Grassland, usually on rocky slopes. **Food and Feeding**. Food primarily insects. Feeds by walking on ground. Most prey apparently detected visually; seldom digs for food, but does probe into bases of grass tufts. **Breeding**. Laying from late Sept to Jan, mainly Oct-Dec. Male aerial display close to ground, then rising and falling vertically 10-15 m on closed wings, calling at peak of ascent. Nest, built solely by female, an open cup lined with dry grass, usually at base of and partially sheltered by a grass tuft or rock; edge of nest often decorated with small stones (15-30 mm diameter), sometimes forming broad "apron" of same size as nest itself. Clutch 2-3 eggs; nestlings fed by both parents; incubation and fledging periods unknown.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Relatively common but patchily distributed. Occurs at low densities even in favoured habitat, as each pair has a large territory. Owing partly to its preference for rocky slopes, which have limited agricultural potential, it remains reasonably common. Nevertheless, its distribution is irregular throughout the grassland biome of South Africa, and this species has probably been adversely affected by widespread habitat transformation.
Bibliography. Clancey (1964b), Harrison *et al.* (1997), Keith *et al.* (1992), MacGregor & Feely (1952), Mackworth-Praed & Grant (1962), Maclean (1993a), Quickelberge (1967), Ryan & Bloomer (1999), Sinclair & Ryan (2003).

46. Karoo Long-billed Lark

Certhilauda subcoronata

French: Alouette du Namaland **Spanish**: Alondra Namaqua
German: Karoo-Langschnabellerche

Taxonomy. *Certhilauda subcoronata* A. Smith, 1843, Deelfontein, Northern Cape, South Africa.
All members of genus with exception of *C. chuana* formerly treated as conspecific, but recent research indicates that they are genetically, morphologically and vocally distinct. Although genetic data suggest that present species has no close relatives within the complex, it is very similar to *C. benguelensis* in morphology and vocalizations. Range overlaps narrowly with that of *C. curvirostris* in NW, and abuts that of *C. semitorquata* at karoo-grassland interface (roughly along 24° E longitude); possible overlap with *C. brevirostris* in S (Breede Valley). Exhibits strong N-S clines in size, colour and streaking. Race *damarensis* possibly belongs with *C. benguelensis*, but plumage and morphology suggest that it represents N end of cline of reduction in size and streaking of present species (by comparison, S race *kaokoensis* of *C. benguelensis* slightly larger, darker and more streaked); this argument supported by a gap in atlas records S of Brandberg, which approximates with geographical boundary between the two taxa. Race *gilli* intergrades with nominate, and *bradshawi* with *damarensis*. Four subspecies recognized.
Subspecies and Distribution.
C. s. damarensis (Sharpe, 1904) - C Namibia.
C. s. bradshawi (Sharpe, 1904) - S Namibia and NW South Africa (Bushmanland).
C. s. subcoronata A. Smith, 1843 - W South Africa (from Kenhardt area S to C Karoo).
C. s. gilli Roberts, 1936 - S Karoo (from Touwsrivier E to Beaufort West).



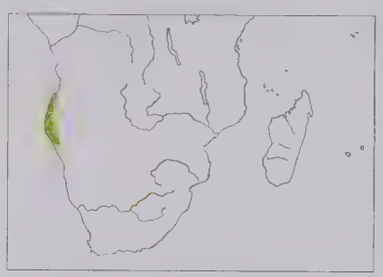
Descriptive notes. 18-22 cm (male on average 12-14% larger in body measurements, 28% longer bill); 31-55 g. Moderately streaked plumage, with narrow pale supercilium and eyering; the second-largest species in the "*C. curvirostris* complex". Nominate race has crown and upperparts rufous, nape paler and greyer, all with rather limited dark streaking; whitish below, breast spotted and streaked dark brown, streaks extending faintly to flanks; eyes brown; bill blackish-horn; legs dull pink-brown. Best distinguished from *C. curvirostris* and *C. brevirostris* by rufous upperparts, contrasting greyish nape, rather limited streaking (especially on flanks); from *C. semitorquata* by larger size, longer bill, more prominent streaking above and below. Sexes alike in plumage. Juvenile has prominent buff-white feather tips above, breast more diffusely spotted. Races differ mainly in size, colour and degree of streaking: *bradshawi* is smaller, less streaked and brighter rufous than nominate; *damarensis* is still smaller, and much paler; *gilli* is largest, darkest and most heavily streaked, with dark rufous-brown upperparts. Voice. Male song, given throughout year, a descending whistle, "peeoooo", in S of range preceded by soft note that sounds at close range like an inhalation, "wi-peeoooo". Also a burry contact call uttered by female, perhaps also by male.
Habitat. Semi-arid Karoo shrublands and fore-Namib mountains; especially abundant in the Nama Karoo. Favours rocky areas, but also found on stony and clayey soils; generally avoids sandy areas.
Food and Feeding. Food includes wide variety of insects and spiders; also seeds, fruits and small corms, but apparently few, if any, grass seeds. Forages on the ground. Searches bases of plants, digs in softer soils, turns over stones; reputed to dig out planted grains in croplands. Also knocks down surface workings of termites (Isoptera) in order to eat termite workers. Takes fruit from dwarf shrubs. Not known to visit watering points to drink.
Breeding. Season varies geographically: breeds after winter rains in SW, eggs Sept-Oct; later, in Nov-Dec, in C Karoo, and even later, Feb-Apr, in C Namibia, in association with late-summer rains (delayed onset of breeding in N mirrored by later post-breeding moult). Male aerial display close to ground, then rising and falling vertically 10-15 m on closed wings, calling at peak of ascent. Monogamous, mostly in pairs throughout year. Nest, reported by some as built by male alone, an open cup, usually at base of a bush, rock or grass tuft, generally without domed roof, although in at least one instance a suggestion of a dome fashioned from overhanging vegetation. Clutch usually 2 eggs, sometimes 3; incubation period unknown; nestlings fed by both parents, fledging period not known; after leaving nest young remain with parents, are fed by them for several weeks.
Movements. Apparently resident. Counts in S Karoo revealed erratic fluctuations in population density, but unclear whether these are real or are artefacts of sampling method.
Status and Conservation. Not globally threatened. Common to very common in most of range; widely distributed in W interior of S Africa. Particularly numerous in C Karoo, where it reaches the highest densities attained by any member of the "*C. curvirostris* complex"; in S Karoo shrublands, attains densities of up to 10 birds/km². Sometimes considered to be a pest in croplands, where alleged to dig out and consume planted grains. Despite its relative abundance, little is known about its breeding biology.
Bibliography. Dean (1997), Dean & Milton (2001), Fishpool & Evans (2001), Harrison *et al.* (1997), Keith *et al.* (1992), Macdonald (1952b), MacGregor & Feely (1952), Mackworth-Praed & Grant (1962), Maclean (1993a), Quickelberge (1967), Ryan & Bloomer (1999), Sinclair & Ryan (2003).

47. Benguela Long-billed Lark

Certhilauda benguelensis

French: Alouette de Benguela **Spanish**: Alondra de Benguela
German: Benguela-Langschnabellerche

Taxonomy. *Alaemon benguelensis* Sharpe, 1904, Benguela, Angola.
All members of genus with exception of *C. chuana* formerly treated as a single species, but recent research indicates that they are genetically, morphologically and vocally distinct. Present species very similar in morphology and vocalizations to N population of *C. subcoronata*, but genetically highly distinct; treated as a separate species, pending further study. Position of taxon *damarensis* somewhat unclear; possibly belongs with present species, but analysis of plumage and morphology suggests better placed with *C. subcoronata*; limited genetic sampling in Namibia of *damarensis* and race *kaokoensis* of present species resulted in uncertainty regarding the taxonomic boundary between them. Two subspecies recognized.
Subspecies and Distribution.
C. b. benguelensis (Sharpe, 1904) - SW Angola and extreme NW Namibia.
C. b. kaokoensis Bradfield, 1944 - NW Namibia S to about Brandberg.



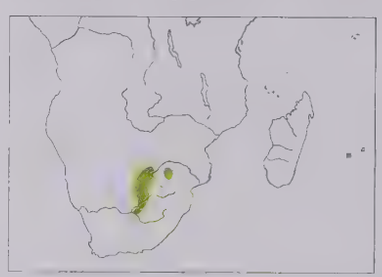
Descriptive notes. 18-20 cm (male on average 12-14% larger in body measurements, 28% longer in bill); 35-53 g. Medium-sized lark with rather pale and only moderately streaked plumage, narrow pale supercilium and eyering. Is more or less grey-brown above, streaked darker; whitish below, breast with dark brownish spots and streaks; eyes dark brown; bill blackish-horn; legs dull pinkish-brown. Sexes alike in plumage. Juvenile has buff-white feather tips above, breast more diffusely spotted. Race *kaokoensis* is smaller and perhaps paler above than nominate. Voice. Male song a slightly quavering, descending whistle, "peeooo", like that of congeners but with perhaps less change in pitch. Also burry contact calls.
Habitat. Arid stony hill slopes and adjacent plains in the fore-Namib; often favours areas with slightly denser scrub.
Food and Feeding. Very little known. Diet includes beetles (Coleoptera) and other insects, and also seeds.
Breeding. Few records, all of nests found in late May: built in shallow cup on ground, usually at base of a rock, grass tuft or small bush; contained 2-3 chicks. No other information.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Locally common in suitable habitat. One of the most common terrestrial bird species on arid coastal plain of SW Angola. Significant populations are conserved in formally protected areas.
Bibliography. Dean (2000), Harrison *et al.* (1997), Keith *et al.* (1992), MacGregor & Feely (1952), Mackworth-Praed & Grant (1962), Ryan & Bloomer (1999), Sinclair & Ryan (2003).

48. Short-clawed Lark

Certhilauda chuana

French: Alouette à ongles courts **Spanish**: Alondra Chuana
German: Akazien-Langschnabellerche
Other common names: Short-clawed Bushlark

Taxonomy. *Alauda chuana* A. Smith, 1836, north of Latakoo, Northern Cape, South Africa.
Closely related to the "*C. curvirostris* complex". Monotypic.
Distribution. SE Botswana and South Africa (adjacent Northwest and Limpopo Provinces, in latter including isolated population on Polokwane Plateau).



Descriptive notes. 17-19 cm; 44 g (male appreciably larger than female). Fairly large, slender lark with prominent pale creamy supercilium, boldly spangled upperparts. Feathers of crown and upperparts are dark blackish-brown with broad buff margins, hindneck paler; throat whitish, rest of underparts pale creamy buff, richer on breast, and variably streaked darker brown on breast; eyes brown; bill dark horn-brown; legs dull pinkish-brown. Distinguished from other members of genus by boldly marked upperparts. More slender and elongate than *Mirafra africanica*, lacking rufous wing panel and rufous crest. Sexes alike, but smaller female much less obtrusive. Juvenile has upperpart feathers tipped white, diffuse spots on breast. Voice. Male song, in aerial display or from perch, a single ascending whistle, "pooooeeee"; also gives series of 1-3 loud, simple whistles, usually descending in pitch, "wheoo wheooo". Variety of burry and harsher contact calls.
Habitat. Rather arid acacia (*Acacia*) savanna on granitic soils; avoids Kalahari sands. Found in areas with fairly short, sparse grass cover and short (2-3 m) scattered acacias; prefers recently fallow land with small *A. tortillis* saplings and heavily grazed areas; absent where less grazing and taller, denser grass cover. On other hand, disappears from areas if excessive grazing results in increased tree and shrub cover (bush encroachment). Occurs in semi-arid *Tarchonanthus* savanna, but at lower densities, in SW of range.
Food and Feeding. Diet includes variety of insects, e.g. grasshoppers (Acrididae), beetles (Coleoptera), caterpillars, termites (Isoptera) and ants, also seeds; chicks fed with insects and other invertebrates. Forages on ground. Most prey located visually, but occasionally uses bill to dig for

items in softer soils. Also gleans insects from low vegetation, and even reported to obtain them by shaking plant stems.
Breeding. Laying Sept-Mar (mostly Oct-Dec), associated with start of summer rains; usually two broods, sometimes more. Monogamous, but some females disperse after breeding, and take new partners in following season; territorial, male defends territory of 2-20 ha. Displaying male flies low, parallel to ground, then swoops straight up for 8-12 m, closing wings while still climbing, whistles at peak, stalls and falls back earthwards, opening wings again just before reaching ground, behaviour very like that of congeners; courts female by strutting around her with tail vertical, or hovering next to her, occasionally presents food to her. Nest built by female, often accompanied by male while collecting material, taking 5-14 days, an open cup placed at base of a grass tuft or shrub, usually on S side of such sheltering vegetation, presumably to maximize amount of shade. Clutch 2-3 eggs (typically 3 in Botswana, 2 in Polokwane area of South Africa), rarely 1, replacement laid if clutch lost; incubation by female only, period 16 days; chicks brooded by female, which often shades them from sun in hot weather, fed by both sexes; young leave nest at c. 11 days, before able to fly, can fly strongly by day 18, fed for at least 1 month, mostly by male; female may start construction of new nest within 1 day of chicks leaving nest, and lay within a week of the last brood fledging. Breeding success in Polokwane Nature Reserve high: 15 chicks fledged from 24 eggs in 12 nests (62%), and in one season one pair made five breeding attempts, three successful (raising six chicks); causes of failure include trampling and apparent predation of eggs, and one chick drowned in severe thunderstorm.
Movements. Resident. Constant dialectal differences in voice in SE Botswana suggest limited dispersal; colour-ringed males, however, could not be relocated more than 2 months after ringing, suggesting considerable turnover in territories.
Status and Conservation. Not globally threatened. Common in Botswana; scarce in South Africa, where classified as "Near-threatened" in Red Data list for that country. Total population estimated at more than 10,000 individuals; possibly this many in SE Botswana alone, where displaying males occur at densities of more than 1/ha. Only 130-300 individuals, however, occur in protected areas. Susceptible to changes in agricultural practices that could cause bush encroachment.
Bibliography. Barnes (2000), Brooke (1984b), Collar & Stuart (1985), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Engelbrecht (2004), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Herremans (1997), Herremans & Herremans (1992), Herremans *et al.* (1994), Hunter (1990, 1991), Hustler (1985), Keith *et al.* (1992), Mackworth-Praed & Grant (1962), Maclean (1993a), Newman (1991), Penry (1994), Robertson (1991), Ryan & Bloomer (1999), Sinclair & Hockey (1996), Tarboton (2001), White (1956), Wilson, J.R. (1984).

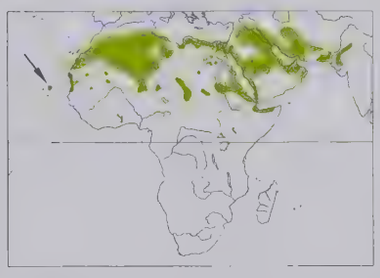
Genus *ALAEMON* Keyserling & J. H. Blasius, 1840

49. **Greater Hoopoe-lark**

Alaemon alaudipes

French: Sirli du désert **German**: Wüstenläuferlerche **Spanish**: Alondra Ibis
Other common names: Hoopoe Lark, Bifasciated Lark, Large Desert Lark

Taxonomy. *Upupa alaudipes* Desfontaines, 1789, between Gafsa and Tozeur, Tunisia.
Affinities uncertain. May form a superspecies with *A. hamertoni*, but differs from that species in nest and display behaviour. Geographical variation rather slight; size increase partially clinal from W to E. Nominate race and *doriae* intergrade in Middle East. Four subspecies recognized.
Subspecies and Distribution.
A. a. boavistae Hartert, 1917 - Cape Verde Is (Boavista, Maio).
A. a. alaudipes (Desfontaines, 1789) - Sahara Desert (from S Morocco S to Mauritania, N & C Mali, C Niger, C & E Chad and N Sudan) E to Syria, Jordan and N Arabia.
A. a. desertorum (Stanley, 1814) - Red Sea coasts from S Sudan (Port Sudan) S to NW Somalia, and from C Saudi Arabia (Jiddah) S to S Yemen (Aden).
A. a. doriae (Salvadori, 1868) - Iraq and E Arabia E to Pakistan and adjacent extreme NW India.



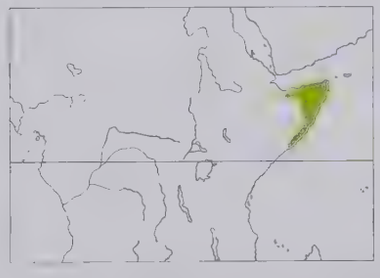
Descriptive notes. 19-23 cm, including bill c. 3-3·5 cm; male 39-47 g (*alaudipes*), 47-51 g (*doriae*), female 30-39 g (*alaudipes*), 46-47 g (*doriae*). Rather large, slim, elongated, long-legged lark with long, thin and decurved bill with very pointed mandibles; long and broad wings, rather long tail; hind claw short (6·2-8·6 mm) and slightly curved. Nominate race has well-marked head pattern, with creamy supercilium, long and narrow dark eyestripe, blackish moustachial stripe; sandy or buffy brown above, grey areas in centre of forehead, central crown, nape and side of head; primaries black with white bases, tipped white (except outers), secondaries white with broad black central band (black-and-white wing pattern striking in flight), long outer primary (extends 1-9 mm beyond primary-covert tips); tail blackish, central rectrices brown with broad paler buffy edges, outer rectrices mainly white; breast cream, blotched with small blackish spots, rest of underparts creamy white; eyes dark brown; bill dark grey; legs and feet pale grey. Rarer grey morph has upperparts uniformly grey; intermediates also occur. Sexes similar. Juvenile is like adult, but head pattern less well marked, upperpart feathers broadly fringed and tipped buffy, outer primary even longer (c. 9-11 mm beyond tips of primary coverts); post-juvenile moult incomplete in late-fledged birds, some retain juvenile feathers in primaries, greater primary coverts and tail. Races differ mainly in size and plumage colour: *boavistae* is smaller, browner and darker than nominate; *desertorum* is as small as previous, greyer; *doriae* is also very grey, small, but larger in W (Iran) than in E (Pakistan, NW India). Voice. Very characteristic song, given in acrobatic flight display, a series of uniform, melodious and rather melancholic piping sounds, starts slowly and accelerates as bird climbs, then a short trill at peak of ascent, then a further series of fluting whistles dropping in speed and tone; song lasts c. 12 seconds, may be repeated after only 5 seconds. Also short, buzzing "zee" or "zrrree" as contact call.
Habitat. Desert or semi-desert, in open plains or rolling terrain, with sandy soils and sparse vegetation cover; also in areas with mixture of gravel and sandy soils. In N Africa highest densities on coastal or sublittoral *regs* (gravel plains with mixed sandy areas) with *Nucularia* bushes and heaps of wind-blown sand. Vegetation height very variable; presence of sand or soft and bare ground appears to be essential. Usually in lowland areas, but to 2000 m in Pakistan.
Food and Feeding. Chiefly invertebrates, some small vertebrates; also some seeds and green material. Main invertebrate groups taken differ regionally, usually dominated by beetle (Coleoptera) larvae, grasshoppers (Acrididae), termites (Isoptera), ant-lion (Myrmeleonidae) larvae, and snails. Small geckos (Gekkonidae) and other lizards also eaten. Normally found singly or in pairs, although small parties have been observed. Digs in sand or soft soil, to depth of 5 cm; when sand patchily distributed, as in heaps around bushes, often flies or runs to it, then walks slowly, stops, and digs purposefully to extract prey. Snails carried into air, then dropped on to hard surface (e.g. a stone) to break the shell; shells also broken by being hammered against stone. Does not require drinking water.
Breeding. Season geographically variable, related to rainfall patterns; Oct-Mar in Cape Verde Is; Feb-Jul, but also Oct (after exceptional rainfall), in N Africa and Saudi Arabia; Mar-Jul, possibly to Sept, in Pakistan and India; one or two broods per season. Territorial; territory size more than 1 km² in Israel. Male song flight highly aerobatic, usually takes off from top of bush, with fluttering wings and spread tail, climbs steeply to c. 2-5 m, twists over, often somersaulting, and dives back to same perch, opening wings just before landing. Nest built by female, from small twigs, lined with soft material, internal diameter 7-8 cm, placed on top of small shrub or grass tussock, more rarely on ground and then sheltered by a tussock or rock; when on ground, is rimmed with stones. Clutch 2-4 eggs (mode 2); incubation by female alone or by both sexes, beginning with last or penultimate egg, period 14 days; nestling period 12-13 days; young remain with parents for at least 1 month. Breeding success determined by rainfall; in Saudi Arabia, only some pairs show nest-building activity and no young reared during dry years, whereas large numbers breed successfully in good rainfall years; annual adult survival rate nearly 60%, higher for males (65%) than for females (34%).
Movements. Usually sedentary; territorial throughout year. Some individuals leave territories in dry years, and erratic movements recorded in N Africa. Recorded as accidental in Canary Is, Senegal, Italy, Malta (often), Greece, Turkey and Lebanon.
Status and Conservation. Not globally threatened. Common and widespread in most countries within its extensive range, as in Cape Verde Is, much of N Africa and Middle East, parts of Saudi Arabia, coastal N Yemen, United Arab Emirates, Oman, Iraq and Kuwait, although very low densities usually reported for large desert interior areas. Present in mountain areas of C Sahara, also in very low densities; frequent in littoral and sublittoral Libya. Fairly scarce in Israel, 100-150 pairs estimated in 1980s, declining; scarce in Pakistan; patchily distributed although locally fairly common in NW India. May have expanded locally in N Algeria and also, perhaps as a result of desertification, in EC Chad. Recorded breeding densities of 0·01 birds/ha in Algeria and 0·04-0·05 birds/ha in suitable habitats in C Arabia.
Bibliography. Ali & Ripley (1987), Allouse (1953), Archer & Godman (1937-1961), Aspinall (1996), Bannerman (1953), Bannerman & Bannerman (1968), Blondel (1962), Borrow & Demey (2001), Brooks, D.J. *et al.* (1987), Brosset (1956, 1961), Browne (1981), Bundy (1976), Bundy & Warr (1980), Butler (1905), Cave & Macdonald (1955), Clapham (1964), Clarke (1980), Cornwallis & Porter (1982), Cowan & Brown (2001), Cramp (1988), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dupuy (1969), Érard & Étchécopar (1970), Étchécopar & Hüe (1964), Gallagher & Woodcock (1980), Giraudoux *et al.* (1988), Goodman *et al.* (1989), Grimmett *et al.* (1998), Hazevoet (1995), van Heezik & Seddon (1999), Hegazi (1981), Heim de Balsac (1936), Heim de Balsac & Mayaud (1962), Henry & Gazave (1998), Hextell (1999), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inbar (1982), Isenmann & Moali (2000), Jennings (1980b, 1981), Keith *et al.* (1992), Kittenberger (1959), Ledant *et al.* (1981), Lees-Smith (1986), Lunais (1984), Mackworth-Praed & Grant (1960, 1970), Marchant (1963), Martín & Lorenzo (2001), Mayaud (1985), Meinertzhagen (1951, 1954a), Moore & Boswell (1956), Morel & Morel (1990), Morel & Ndao (1978), de Naurois (1989), Newby (1980), Newton & Newton (1997), Niethammer (1955b, 1963b), Nikolaus (1987), Paludan (1959), Ramadan-Jaradi & Ramadan-Jaradi (1999), Richardson (1990), Rietkerk & Wacher (1996), Ripley (1982), Roberts (1992), Salvan (1968), Schönwetter (1979), Shelton (1997), Shirihai (1996), Shobrak (1998), Simon (1965), Smith (1965), Snow & Perrins (1998), Sultana & Gauci (1982), Svensson *et al.* (1999), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Tieleman (2002), Tieleman & Williams (2002a, 2002b), Tieleman, Williams & Buschur (2002), Tieleman, Williams, Buschur & Brown (2003), Valverde (1957), Vaurie (1959), Walker (1981b), Wallace (1983, 1984), Welch & Welch (1984), White (1957b, 1961a), Williams & Tieleman (2000), Williams *et al.* (1999).

50. **Lesser Hoopoe-lark**

Alaemon hamertoni

French: Sirli de Witherby **German**: Somaliläuferlerche **Spanish**: Alondra de Hamerton
Other common names: Witherby's Lark

Taxonomy. *Alaemon hamertoni* Witherby, 1905, Obbia, Somalia.
Affinities uncertain in absence of genetic data. May form a superspecies with *A. alaudipes*; differs, however, from that species in nest and display behaviour. Possible link with *Certhilauda* proposed by some authors. Geographical variation limited, and possibly clinal; racial identity of birds in NE corner of Somalia not known, tentatively placed with *altera* but further study needed. Three subspecies recognized.
Subspecies and Distribution.
A. h. tertia S. R. Clarke, 1919 - inland in NW Somalia.
A. h. altera Witherby, 1905 - N & NE Somalia.
A. h. hamertoni Witherby, 1905 - coast of C Somalia, extending inland to Ethiopian border in N.



Descriptive notes. 17-21 cm. Large, slender lark with uniform plumage, long bill and legs. Has plain face apart from faint paler supercilium; virtually plain above, pale grey-brown, with slightly darker brown flight-feathers; underparts whitish or buffy, breast with indistinct mottling; eyes dark brown; bill horn; legs whitish. Differs from *A. alaudipes* in smaller size, plain face and wings, lacking black-and-white wing pattern; distinguished from *Mirafra somalica* (which has almost identical geographical range) by always plainer and generally paler plumage. Sexes alike in plumage, female on average smaller than male. Juvenile unknown. Races differ in upperpart coloration: *tertia* is more rufous tawny-sand than nominate; *altera* is paler and warmer sandy brown. Voice. Undescribed.
Habitat. Open grassland, favouring tussock grass; generally avoids areas with any shrubs or trees. No known range overlap with *A. alaudipes*.
Food and Feeding. Diet likely to consist largely of insects. Feeds on ground, running rapidly and covering large distances. Behaviour and gait like those of a pipit (*Anthus*). Uses the bill to dig vigorously in soft sand for insect larvae. Frequently perches on top of grass tufts.

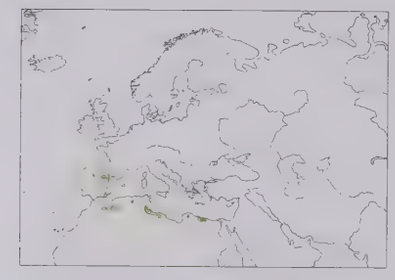
Breeding. Recorded in May-Jun. Probably monogamous; usually observed in pairs. Has distinctive display-flight, parachuting back to ground on open wings from considerable height. Two nests found, each an open cup lined with fibrous grass stems, in shallow depression in loose, sandy soil, one at base of a grass tuft, the other in the open and sheltered only by few short stems. Clutch 2-3 eggs; parental duties and incubation and fledging periods unknown.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Common to locally common. Poorly known species.
Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Clancey (1986b), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Mackworth-Praed & Grant (1960).

Genus *CHERSOPHILUS* Sharpe, 1890

51. Dupont's Lark
Chersophilus duponti

French: Sirli de Dupont **German**: Dupontlerche **Spanish**: Alondra Ricotí

Taxonomy. *Alauda Duponti* Vieillot, 1820, Provence, south France.
Relationships uncertain. Races well differentiated; populations from Morocco E to N Tunisia, however, somewhat intermediate in colour between nominate and *margaritae*, and locally rather variable. Two subspecies recognized.
Subspecies and Distribution.
C. d. duponti (Vieillot, 1820) - Spain (mainly E Castilla y León and Aragón, also W Castilla y León near Portuguese border, E Castilla-La Mancha and SE Andalucía), Morocco (mostly in NE, E of Midelt and R Moulouya, also some recent records from S of Great Atlas) and N Algeria (Hauts Plateaux).
C. d. margaritae (Koenig, 1888) - Algeria (S slopes of Atlas Mts E to Biskra), SE Tunisia, N Libya and coastal W Egypt.



Descriptive notes. 17-18 cm; c. 32-47 g. Medium sized, densely streaked, relatively long-legged lark with long neck, long slender bill with distal half decurved, rather short wings, short tail; toes and claws short and thick, but hind claw long (8-12·5 mm) and straight. Nominate race has thin pale median crown-stripe, buff-white supercilium and eyering, thin dark malar stripe; brown above, densely streaked, feathers of mantle and scapulars with narrow pale fringes; wings with reduced outer primary (4-11 mm short of tips of primary coverts); underparts whitish, breast prominently streaked dark brown; eyes dark brown; bill flesh-coloured with darker culmen, lower mandible paler; legs flesh-brown. Differs from rather similar *Alauda arvensis* in slimmer build, with long neck and long, curved bill. Sexes similar. Juvenile is like adult, but upperpart feathers with broader scaly fringes and white tips, outer primary longer (about equal to longest covert) and broader. Race *margaritae* is much paler and cinnamon reddish, less prominently streaked, has longer bill, shorter hind claw. Voice. Male song, from ground or in flight, mostly at dawn and sunset, a mix of twittering with buzzing notes, like Eurasian Linnet (*Carduelis cannabina*) song, often lasting up to 30 minutes or more. Most common call a very characteristic, ventriloquial, human-like whistle, "hoo hee" or "pu chee", second note rather nasal and drawn out, usually given from ground behind concealing vegetation, sometimes in flight; alarm a shrill "tsii".

Habitat. Open plains with shrub-steppe or feather-grass (*Stipa*) steppe, on flat or rolling terrain. In Spain, shrubs mainly 40-60 cm tall, and medium-high percentage of bare ground; altitudinal range 50-1550 m, most at 1000-1400 m. In N Africa, *Stipa tenacissima* steppes apparently preferred to wormwood (*Artemisia*) shrubs; at 600-1200 m. Also found in cereal fields outside breeding season.
Food and Feeding. Diet insects and seeds. Few details on adult diet, restricted to Spain; few stomachs analysed contained beetles (of families Carabidae, Tenebrionidae, Scarabaeidae, Silphidae, Curculionidae), grasshoppers (Acrididae) and ants, also seeds (mainly of *Asphodelus*); also observed to dig for beetle larvae (probably Tenebrionidae and Elateridae) in spring. Nestlings fed only with invertebrates, mainly spiders, grasshoppers and caterpillars, 6-12 mm in size. Feeding behaviour little known; forages mainly by digging; has been observed to catch spiders (of family Lycosidae) in their holes, and to dig in dung. Apparently does not drink water.
Breeding. Mar-Jul; song from Jan-Feb, pairing in Spain in Mar; often more than one brood. Probably semi-colonial; territorial. Song-flighting male rises to often considerable height (100-150 m), remains aloft, singing continuously, for 30 minutes or more, suddenly descends rapidly and vertically to ground; wing-clapping recorded during song flights at lower levels. Nest a scrape on ground, beside small shrub or tuft or in open, lined with twiglets, vegetable fibres and hair, orientation mainly in NE-NW quarter. Clutch 3-4 eggs (mode 3) in Algeria and Tunisia, 3-5 (mode 4) in Spain; replacement clutch laid if previous one lost; incubation period 12-13 days; hatching of last chick, often also penultimate one, asynchronous; chicks tended and fed by both parents, nestling period 8 days, probably longer if nest not disturbed; period of juvenile dependence unknown. Nestling mortality in Spain very high, up to 84%, in some cases mainly through predation by snakes and foxes. Longevity at least 4 years.
Movements. Resident; probably irregular movements during winter. In Spain, has been observed in winter flocks with other lark species, on extensive cereal cultivations; winter records in N Africa outside known breeding areas. Vagrants recorded E & N to Italy, Malta, Greece (Crete) and Cyprus.
Status and Conservation. Not globally threatened. Sparsely distributed and uncommon in most areas. Range relatively small and fragmented; still imperfectly known owing to the species' secretive habits. In Morocco, common during early 1960s in Hauts Plateaux, extending up upper Moulouya Valley; also scattered sightings S of High Atlas Mts (between Ouarzazate and Taroudant and in Boumalne du Dadès area). Nowhere common in Algeria, where most records in NW, towards Moroccan border; in 1935-1937 bred commonly in Tebessa, near Tunisian border. Probably rare and local in Tunisia, occurring at scattered sites from Feriana region S (through Gafsa, Kebili, Matmata and Tatahouine) to Libya; rarely seen in recent times. In Libya, thinly distributed in Tripolitania and scarce and local in Cyrenaica (Jabel al Akhdar E to Al Adam). Scarce along coast of Egypt (Salum E to Bahig), breeding reported in 1994. In Spain, where breeding status was long overlooked, total area occupied calculated at c. 500 km^2 and population in 1988 at c. 13,000 individuals (although recent work suggests that numbers greatly overestimated owing to inaccurate methodology); 68% of population in high-altitude areas of Iberian System and nearby zones of N Meseta provinces of Guadalajara, Soria and Segovia (0·2-0·4 pairs/ha calculated in Soria), 28% in shrub-steppes of middle Ebro Valley (Huesca, Zaragoza and Teruel), and remainder scattered in small isolated nuclei in other areas of N Meseta (Zamora), S Meseta (Cuenca, Albacete), Murcia region and SE Andalucía (Granada, Almería). Probable former breeding elsewhere in Europe indicated by 19th-century records from Portugal (near Lisbon) and S France (mostly from Crau, where last recorded in 1915). Recently included in "Endangered" category in Spanish Red Data Book on basis of small population size and apparently rapid decline; threatened by habitat loss through reafforestation schemes, agricultural expansion and, perhaps, inappropiate sheep-stock levels leading to either overgrown or overgrazed vegetation; proposed construction of airport at Lleida could exterminate the sole surviving population in Catalonia.
Bibliography. Aragüés & Herranz (1983), Asensio (1998), van den Berg (1984), Bergier & Bergier (1990), Brosset (1956, 1961), Bundy (1976), Bundy & Morgan (1969), Cañadas *et al.* (1988, 1989), Castell (1996a), Charron (1987), Colin (1988), Cramp (1988), Dubois *et al.* (2000), Etchécopar & Hüe (1964), García (1994), Garza & Suárez (1989, 1990), Garza, Suárez & Tella (2003), Garza, Traba & Suárez (2003), Gaston (1970), Goodman *et al.* (1989), Goriup (1988a), Hagemeijer & Blair (1997), Handrinos & Akriotis (1997), Hazevoet (1989b), Heath *et al.* (2000), Heim de Balsac (1936), Heim de Balsac & Mayaud (1962), Herranz, Manrique *et al.* (1994), Herranz, Yanes & Suárez (1993), Hollom *et al.* (1988), Isenmann & Moali (2000), Jansen (2004), Jonsson (1992), de Juana (1980), de Juana *et al.* (1988), Le Fur (1975), Ledant *et al.* (1981), Manrique *et al.* (1990), Martín-Vivaldi *et al.* (1999), Mayaud (1985), Meinertzhagen (1951), van Scheepen & Meijer (1996), Schönwetter (1979), Smith (1965), Snow & Perrins (1998), Suárez & Garza (1989), Suárez & Oñate (1994), Suárez, Fernández & de Lope (1989), Suárez, Garza *et al.* (2003), Suárez, Santos & Tellería (1982), Svensson *et al.* (1999), Tellería *et al.* (1999), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Vaurie (1959), White (1957b), Wunderlich (1987), Yanes *et al.* (1997).

PLATE 57 ➤


inches 3
cm 8
PLATE 57
ssp leucotis
ssp smithi
52
ssp melanocephalus
53
ssp hoeschi
ssp nigriceps
ssp verticalis
ssp albifrons
54
ssp melanauchen
55
ssp khama
variants
57
56
58

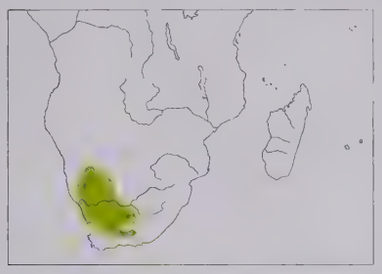
Genus *EREMOPTERIX* Kaup, 1836

52. Black-eared Sparrow-lark

Eremopterix australis

French: Moinelette à oreillons noirs **Spanish**: Terrera Orejinegra
German: Schwarzwangenlerche
Other common names: Black-eared Finch-lark, Grey-backed Sparrow-lark(!)

Taxonomy. *Megalotis australis* A. Smith, 1836, Colesberg, Orange River, Northern Cape, South Africa. Typically considered to be an outlier within *Eremopterix*, because of its unusual plumage; whether this reflects a basal position within the genus is unclear. Monotypic.
Distribution. S Namibia (S from N Namaqualand), extreme SW Botswana (Kalahari-Gemsbok National Park) and W half of South Africa (Great Karoo).



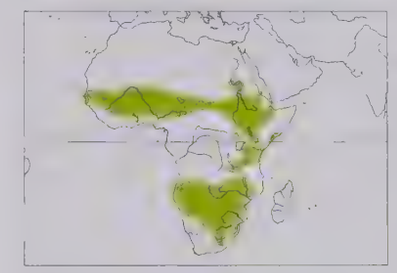
Descriptive notes. 12-13 cm; 12-16 g. Small, sexually dimorphic lark resembling a finch (Fringillidae). Adult male is highly distinctive; has black head, neck and underparts; rest of upperparts chestnut with darker feather centres, wing-coverts and tertials blackish with broad chestnut fringes; flight-feathers dark blackish-brown; black underwing, which is distinctive in flight; eyes brown-red; bill bluish-white to pale steel-grey; legs greyish-white to dull flesh. Female is warm brown, streaked darker brown, above, tertials and wing-coverts with broad rufous fringes, face mottled brown with rather weak, pale supercilium, underparts whitish with quite dense dark streaks becoming thinner and fainter towards belly and flanks, underwing-coverts and most of underside of secondaries blackish, bill pale straw to whitish-flesh with darker, greyer culmen, legs pale pinkish-flesh; lacks dark belly patch of females of other members of genus, and differs from *E. leucotis* in having uniform rump and back, from *E. verticalis* in darker brown coloration above, from both in having more extensive black on underwing. Juvenile resembles female, but upperpart feathers have pale tips and dark subterminal bars, giving more spotted or scaly appearance, breast streaks more diffuse, appearing mottled; immature male plumage (acquired in post-juvenile moult, several months after fledging) similar to female, but with variable amount of black feathering on face and breast, adult plumage acquired after first complete moult at c. 1 year old. Voice. Male song a short twitter, given mostly from ground; usual song in aerial display a simple series of buzzy notes. Chorus of calls from flushed flock deeper and less sharp than that of *E. verticalis*. Greeting call a trilled "preee"; alarm a sharp "dreee"; distress call of male a soft "tik-tik-tik", of female a raspy "chee-chee-chee". Adult feeding call to chicks a soft "preep".
Habitat. Shrubland and grassland, often in association with *Rhigozum* shrub patches, in the Karoo and S Kalahari. Largely confined to red sands in the Kalahari and W Namaqualand, but common on clays and stony soils in the Karoo. Often found in areas of denser vegetation along shallow drainage lines, but avoids riparian systems with acacias (*Acacia*); appears to prefer taller and denser vegetation than that inhabited by *E. verticalis*.
Food and Feeding. Primarily grass seeds, but also some forbs and *Lycium* fruits; also insects, including termites (Isoptera), beetles (Coleoptera), ants, bugs (Homoptera). Forages on the ground, in bare areas among denser vegetation, usually in flocks; typically shuffles along in crouched posture, but stands erect when alarmed. Picks food items from ground or directly from plants. Very seldom drinks water.
Breeding. Nesting recorded in all months; breeds opportunistically after rain, requires at least 40 mm of rain to stimulate widespread breeding; in N & NW Karoo, abundance of *Stipagrostis* awns, used for lining nest, may be indicator of suitable breeding conditions. Monogamous. Nests singly, normally in small pockets with conspecifics (sometimes within 20 m of another pair) alongside large numbers of other nomadic seed-eaters, notably *E. verticalis*, *Spizocorys starki* and Lark-like Bunting (*Emberiza impetuani*). Male butterfly-like display-flight 5-15 m above ground, with deep, exaggerated wingbeats showing off black underwings, then lands, with head erect and tail cocked, next to female; displaying may occur for several weeks before nesting commences, although interval between rains and breeding shorter in austral summer (1-3 weeks) than in winter (up to 11 weeks), linked to lag in seed-set by grasses. Nest built by female, taking 4-5 days, in shallow scrape in ground against base of a bush (normally on E or SE side, where shaded from afternoon sun, although often in the open in winter months), foundation of sticks, lined with fine grass leaves and awns, rim characteristically decorated with dry twigs and sand-encrusted webs of *Seothyra* spiders, the webs occasionally delivered by male but placed in position by female. Clutch 2-3 eggs, rarely 1 or 4 (mean 2·5), laid at 1-day intervals, clutch size increases with increasing rainfall; incubation usually from first egg, both sexes contributing roughly equal effort during day; male often alerts sitting partner to danger by flying over territory, then diving down over nest; incubation period 8-12 days (average 10·2 days); newly hatched chicks brooded and fed by both parents, male more time than female; when nest approached, both sexes may attempt to lure intruder away by fluttering along ground and calling (feigning injury), male also has low aerial display, with exaggerated wingbeats or occasionally loud wing-snaps, which may also serve to distract intruders; chicks leave nest, typically at instigation of female, after 6-11 days, usually 9 days, before able to fly, initially crouch when threatened but within few days can run rapidly; able to fly after 15-20 days. Breeding success generally low owing to high rate of nest predation, primarily by small mammalian predators such as mongooses (Herpestidae); most losses occur during egg stage, only 50% of clutches survive to due hatch day, 87% of eggs reaching that date hatch, and 74% of broods survive to fledging; overall breeding success 31%, with 0·86 young fledged per attempt, and in the Kalahari only 25% of nests successful; clutch size had no impact on risk of nest predation; in one case, a chick killed and eaten and another badly injured by a large spider (burrow of which opened into the nest-chamber); heavy rain can also cause severe chick mortality, with 77 mm of rain over 2 days killing 43% of chicks. Maturity usually at 1 year; some males breed in immature plumage.
Movements. Nomadic, moving in response to rainfall events. Occurrence, however, quite predictable in certain areas (e.g. Tankwa Karoo), despite limited rainfall; atlas-survey records suggest general movement S in summer months, perhaps to avoid excessive heat in S Kalahari.
Status and Conservation. Not globally threatened. Common, even locally abundant when conditions favourable. Most abundant in Nama Karoo and on Namaqualand coastal plain; patchily distributed in S & C Karoo; generally less common in Namibia and Botswana. Average flock size in the Karoo 40 birds, but highly variable, and flocks not very cohesive. Historical breeding records from the former Transvaal (where last recorded 1870) suggest possible range contraction. The species' core range is poorly represented in formal conservation areas. In view of its wide-ranging nomadic behaviour and apparent preference for taller, denser vegetation, which makes it perhaps the most susceptible of the Karoo nomadic seed-eaters to poor grazing practices, its status should be monitored.
Bibliography. Cooper & Donnelly (1983), Dean (1997), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Keith *et al.* (1992), Lloyd (1998, 1999, 2004), Lloyd *et al.* (2000), Mackworth-Praed & Grant (1962), Maclean (1970a, 1970b, 1993a), Sinclair & Hockey (1996), Sinclair & Ryan (2003), Tarboton (2001).

53. Chestnut-backed Sparrow-lark

Eremopterix leucotis

French: Moinelette à oreillons blancs **Spanish**: Terrera Orejiblanca
German: Weißwangenlerche
Other common names: Chestnut-backed Finch-lark, White-cheeked Sparrow-lark/Finch-lark

Taxonomy. *Loxia leucotis* Stanley, 1814, coast of Eritrea.
Relationships uncertain; has been considered to form a superspecies with *E. nigriceps* on basis of male plumage patterns. Five subspecies recognized.
Subspecies and Distribution.
E. l. melanocephalus (M. H. K. Lichtenstein, 1823) - Senegal E to C Sudan.
E. l. leucotis (Stanley, 1814) - SE Sudan, Ethiopia, Eritrea and NW Somalia.
E. l. madaraszi (Reichenow, 1902) - NE Uganda, Kenya, coastal S Somalia, Tanzania and N Mozambique.
E. l. hoeschi C. M. N. White, 1959 - S Angola, W Zambia, N Namibia, N Botswana and NW Zimbabwe.
E. l. smithi (Bonaparte, 1850) - E Zambia, S Malawi, W & C Mozambique, E Zimbabwe, E Botswana and E South Africa.



Descriptive notes. 12-14 cm; 12-21 g. Small, sexually dimorphic lark with appearance like that of a finch (Fringillidae). Adult male nominate race has head mostly black, with large white ear-covert patch and variable white nape; upperparts rich chestnut, rump and uppertail-coverts paler greyish-buff; wing-coverts mostly chestnut, outer lesser coverts whitish, median coverts blackish; flight-feathers brown, broad chestnut margins of secondaries and tertials; tail brown, central feathers broadly edged chestnut, outer feathers edged whitish; mostly black below, variable whitish rear flanks and vent, underwing-coverts blackish (prominent in flight); eyes brown; bill whitish; legs pale flesh-grey. Distinguished from all congeners by combination of fully black crown, white ear patch and rich chestnut upperparts. Female is duller than male, has brown crown and grey-brown ear-coverts, duller chestnut upperparts streaked dark brown and with narrow pale margins, variable whitish collar, creamy-buff underparts with variable dark brown streaks on breast and throat, blackish-brown central belly (often extending up central breast to throat), slightly duller horn-coloured bill; differs from females of most congeners in chestnut upperparts with contrasting paler rump, from *E. australis* by blackish belly patch and less extensive black on underwing, from *E. signatus* by more streaked face and no rufous supercilium. Juvenile resembles female, but has white fringes on crown and back feathers; plumage retained for only a few weeks or months, male moults into mottled immature plumage. Races vary mostly in plumage colour, also size (larger in S): *madaraszi* male is redder-tinged above, bill larger, female duller with throat to belly blackish; *hoeschi* male is more tawny above, female paler and greyer with pale underparts; *smithi* male resembles previous, female has dull chestnut ground colour above, black patch on lower breast and belly; *melanocephalus* is more distinctive, male brighter and redder above, mostly white outer wing-coverts, female brighter chestnut above, breast pale buff with dark brown mottling, dark brown on central belly. Voice. Male song rather monotonous "shrimp zzt zzt zrit", final note higher-pitched; also gives sweet, high-pitched whistles. Flight call a sharp, high-pitched "chip", typically in chorus by many birds when flock rises.
Habitat. Short, open grassland, and semi-arid savanna. Favours bare ground, burnt areas, fallow fields and recently ploughed lands.
Food and Feeding. Food mostly grass seeds; grasshoppers (Acrididae) and other insects taken primarily when feeding chicks. Usually occurs in small flocks of up to 50 individuals, sometimes among flocks of others of genus, especially *E. signatus*. Feeds on the ground, typically shuffling along in crouched posture. Uses elevated perches, including termitaria, trees and wires, to reduce heat stress. Drinks frequently.
Breeding. Mostly Oct-Mar in N; during dry season, Mar-Sept, in Zambia, Zimbabwe and Malawi; in South Africa often earlier, mostly Mar-Apr (at end of summer rains), although nesting recorded throughout year; some pairs double-brooded. Monogamous. Nests singly or in small groups, with inter-nests distance as little as 3 m. Male performs display-flight, circling 10 m above ground, also displays to female on ground, with drooped wings and raised plumage; pugnacious, chases off other males and even other species. Nest built by both sexes, material added even after eggs laid, an open cup lined with grass and rootlets, in shallow depression usually at base of a small grass tuft; in S most nests are on S to E side of sheltering vegetation, presumably to provide afternoon shade. Clutch 1-2 eggs, rarely 3, varying regionally, usually 1 in W Africa but 2 (mean 1·9) in S Africa, laying interval 1 day; incubation by both sexes, apparently solely by female at night, shifts generally fairly short (maximum 1-3 hours), female when being relieved often solicits food from male, fed by regurgitation; in one case an offspring from the previous

On following pages: 54. Black-crowned Sparrow-lark (*Eremopterix nigriceps*); 55. Grey-backed Sparrow-lark (*Eremopterix verticalis*); 56. Chestnut-headed Sparrow-lark (*Eremopterix signatus*); 57. Fischer's Sparrow-lark (*Eremopterix leucopareia*); 58. Ashy-crowned Sparrow-lark (*Eremopterix griseus*).

brood incubated when female left nest, was fed by latter on her return to resume incubation, then chased off by female when male returned; incubation period 11 days; chicks hatch within hours of each other (suggesting that incubation starts only when clutch complete), eggshell fragments removed by parents, both sexes brood and feed chicks, female probably undertaking greater part of provisioning, chicks fed with regurgitated seeds or single seeds collected close to nest; adults fly over intruders, calling agitatedly; chicks leave nest with only half-grown flight-feathers, follow the foraging female, fledging period 10-12 days. Maturity 1 year; some males breed before attaining adult plumage.

Movements. Mostly nomadic; some populations resident, others perhaps fully migratory. In W Africa, post-breeding movement from N margin of range in the Sahel (where breeding during rains) S into more mesic areas, but other W populations resident. Movements erratic and poorly understood in Kenya; most Tanzanian records are of non-breeding birds moving S in dry season. In S Africa, resident in some areas (e.g. Zambezi Valley, Springbok flats) but nomadic elsewhere; irrupts W into more arid areas during summer rains and E into more mesic areas in dry season, but movements not well understood, with breeding in both wet and dry seasons.

Status and Conservation. Not globally threatened. Fairly common to common throughout much of its range, but scarce and erratic at the periphery. Risk of potential threat from habitat loss minimized by fact that it favours agricultural lands and disturbed areas.

Bibliography. Ash & Miskell (1998), Bannerman (1953), Barlow *et al.* (1997), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Butler (1905), Byaruhanga *et al.* (2001), Chittenden & Batchelor (1977), Clancey (1964b), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Ginn *et al.* (1989), Gore (1990), Grimes (1987), Harrison *et al.* (1997), Irwin (1982), Irwin & Lorber (1983), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1962, 1970), Maclean (1993a), Morel & Morel (1984), Nikolaus (1987), Penry (1994), Salvan (1968), Short *et al.* (1990), Sinclair & Hockey (1996), Stevenson & Fanshawe (2002), Steyn (1964), Tarboton (2001), Vincent (1946), Zimmerman *et al.* (1996).

54. Black-crowned Sparrow-lark

Eremopterix nigriceps

French: Moinelette à front blanc **German**: Weißstirnlerche **Spanish**: Terrera Negrita
Other common names: Black-crowned Finch-lark, White-fronted/White-crested Sparrow-lark/Finch-lark

Taxonomy. *Pyrrhalauda* [sic] *nigriceps* Gould, 1839, São Tiago, Cape Verde Islands.

Relationships obscure. Sometimes placed in a superspecies with *E. verticalis*, *E. signatus* and *E. leucopareia*, but has also been considered to form a superspecies with *E. leucotis* on basis of male plumage patterns; alternatively, often regarded as closest to *E. griseus*. Geographical variation largely clinal, size increasing from W to E. Birds from Socotra described as race *forbeswatsoni*, but considered indistinguishable from *melanauchen*. Four subspecies recognized.

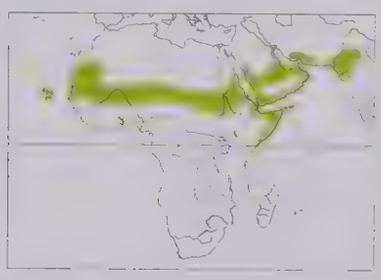
Subspecies and Distribution.

E. n. nigriceps (Gould, 1839) - Cape Verde Is.

E. n. albifrons (Sundevall, 1850) - Mauritania and Senegal E to Sudan (E to R Nile).

E. n. melanauchen (Cabanis, 1851) - E Sudan E to extreme S Iraq, Kuwait and C & S Arabian Peninsula, and S to Somalia and Socotra.

E. n. affinis (Blyth, 1867) - SE Iran E to Pakistan and NW India.



Descriptive notes. 10-11 cm; 12-16 g. Small, sexually dimorphic lark resembling a finch (Fringillidae); diagnostic white forehead, rarely absent (one bird from Sudan). Adult male nominate race has distinctive black-and-white head pattern (variable, rarely black replaced by dark brown); upperparts sandy-brown with reddish tinge, paler and greyer in worn plumage (often appearing silvery in harsh desert light); wings darker brown, wing-coverts with pale fringes, median coverts form darker bar on folded wing; tail dark brown, central feather pair with broad pale greyish margins, outer rectrices with narrower whitish edges; chin and entire underparts black, except for white thighs and narrow white stripe down side of breast; underwing-coverts and undertail black, underside of flight-feathers sooty grey-brown; eyes dark brown; bill bluish-white; legs pale flesh. Differs from *E. signatus* in blacker head markings, white forehead, no white crownstripe, much narrower white on breast side; from *E. griseus* in head pattern, less grey upperparts. Female lacks male's distinctive head pattern, is rather nondescript at rest, greyish-rufous above, whitish below, brownish with variable streaking on breast, dark underwing with black underwing-coverts, bill duller horny steel-grey; distinguished from somewhat similar *Eremalauda dunni* and *Ammomanes* and *Calandrella* species mainly by small size, short tail, stubby bill, usually dark median-covert bar, in flight also distinctive dark underwing; from female *E. signatus* by paler coloration, no rufous supercilium or dark belly patch, from female *E. griseus* by sandier general coloration with paler, plainer wings. Juvenile resembles adult female, but with buff margins of contour feathers above, looking slightly scaled; at least some juvenile males moult into intermediate plumage 2-3 months after fledging, others acquire almost complete adult plumage at first moult but typically with cheeks greyer and some paler tips in black breast feathers. Races differ chiefly in extent of male's white forehead patch, also in upperpart colour (but varies individually with degree of wear), and size: *albifrons* is larger than nominate, with more white on forehead, longer wing and tail, female less reddish; *melanauchen* is slightly bigger and greyer than previous, male with smaller white frontal patch, black on lower hindneck; *affinis* is like previous but bigger. Voice. Male song, in aerial display or from low vantage such as bush or rock on ground, considerably variable in structure, typically a short series of simple, sweet, plaintive notes, "tsoo-wee-tsuit", repeated every 1 second; songs similar at a single site, but regional variation over relatively small distances in Yemen. Both sexes also give "tchip" or "cherp" contact call, usually in flight, also softly on ground; also "zree" as alarm, mostly by male, when nestlings approached by intruder. Chicks out of nest frequently call "cheoop".

Habitat. Arid and semi-arid plains with scattered grass and other low-lying vegetation; prefers sandy soils rather than rocky substrates. Also occurs around saline pans.

Food and Feeding. Primarily seeds of grasses and other plants; also insects and other invertebrates, including grasshoppers (Acrididae), beetles (Coleoptera), bugs (Homoptera) and spiders. Chicks fed mainly with insects, including lepidopterans (both adult moths and caterpillars), and other insect larvae. Forages in flocks, usually of 20-50 individuals, occasionally more (to several thousands), when not breeding. Feeds on the ground, stance rather erect compared with that of congeners; takes items from ground surface or from plants, also gleans items from cattle dung; occasionally flutters up to grasp prey out of reach, and will also hawk for insects, showing surprising agility in air. Can be remarkably tame; feeds on spilled grain inside shops in Somalia. Most foraging takes place in early morning and evening. In hot weather seeks shade under bushes, or occasionally in large lizard burrows during heat of day, greatly reducing water loss; loses heat by flying with legs dangling, or by perching with drooped wings, facing into wind, on elevated site. Apparently requires little water, but drinks regularly when water available; tolerates brackish water, observed drinking along seashore and from tidal lagoons in Somalia (albeit in areas where possibly some freshwater seepages).

Breeding. Nesting mostly in association with rainfall, typically in summer in most of range, but also opportunistically, whenever conditions suitable, with records in virtually all months; season short, Apr-Sept, in NE Saudi Arabia (apparently single-brooded); Feb-Sept in Pakistan and India. Monogamous; nests singly or in loose aggregations. Male performs aerial display over territory, rises steeply from ground to 5-10 m, circles while calling for up to 1 minute, then descends in a series of shallow swoops; members of established pair also frequently display together, male chasing female in rapid, twisting low flight; also variety of displays by male to female on ground, including rushing at female with crest raised, head angled down and wings drooped ("charging"), strutting with raised head, vertical tail and drooped wings ("tail-cocking"), approaching female in near-prostrate creeping posture ("sidling"), and apparently less intense form of last with crest raised ("horizontal rigid"). Female apparently selects nest-site, also builds nest, in 2-3 days, shallow depression excavated with the breast, by turning around with wings spread, or natural hollow used where substrate hard, lined with 6-20 large twigs, then with finer grass stems, leaves and awns, also wool, paper and other litter, rim usually decorated with small stones or clods of earth; site typically at base of a grass tuft or shrub, normally on N or E side and thus shaded from hot afternoon sun; in one case, late in season, a pair nested 1 m above ground in hollow under a slab of cement in a pile of rubble, nest barely lined; male, and occasionally female, defend nest-site against other bird species and lizards, as well as conspecifics. Clutch 2-3 eggs, in Somalia occasionally 4, usually 2 in N Africa and India, more frequently 3 (mean 2·6) in NE Saudi Arabia; laying starts 2-3 days after nest completed, laying interval 1 day; incubation apparently from second egg, by both sexes, female doing more (c. 75%), period 11-12 days; in 3-egg clutches, last chick hatches 20-35 hours after other two, is appreciably smaller; chicks brooded and fed by both parents, female doing greater part of brooding, male provisioning more, brooding most intense in hot weather, involves standing over chicks to shade them; feeding mostly in early morning and evening (30% before 08:00 hours, 37% after 16:00); faecal sacs removed by both parents or, rarely, swallowed at nest; male, occasionally also female, distracts intruders by feigning injury or scuttling away from nest; chicks start to leave nest for short periods from day 6, typically leave entirely by day 8, long before able to fly; within a day after nest left, each parent takes sole responsibility for one chick, and chicks separate, possibly to reduce risk of predation; young can run strongly by day 12, flutter weakly by day 14, although wings fully grown only by day 21-22, when tail still barely developed. Breeding success fairly low, c. 20%, with 50% of nests surviving to hatch date and 40% of hatchlings surviving to leave nest (day 8); third egg in 3-egg clutches appears to be for "insurance", as, of six sets of three chicks, only one chick survived to nest departure and that one died within a day (apparently because each parent feeds only a single chick). Maturity normally at 1 year; presumed immature males (in female-like plumage) occasionally recorded as singing and displaying.

Movements. Most populations, even small island ones, subject to some local movements, following favourable conditions; apparently resident in some areas, breeding in same sites in successive years. Some appear to undertake regular migrations, e.g. moves N in summer rainy season to breed in the Sahel (Aug-Oct) and N Arabia (Apr-Sept). Occasionally loose flocks of several thousand individuals in E Saudi Arabia, possibly on migration.

Status and Conservation. Not globally threatened. Locally common throughout much of range. Breeding density up to 1 pair/3 ha in favourable conditions. Desertification in W Africa has led to extension of range to S, resulting in regular occurrence in N Nigeria, where formerly absent. Tolerates moderate levels of grazing pressure.

Bibliography. Ali & Ripley (1987), Archer & Godman (1937-1961), Ash & Miskell (1998), Aspinall (1996), Balança (1996), Bannerman (1953), Barlow *et al.* (1997), Bergier & Horner (1990), Borrow & Demey (2001), Cramp (1988), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Étchécopar & Hüe (1964), Fishpool & Evans (2001), Goodman *et al.* (1989), Grimmett *et al.* (1998), Hazevoet (1995), Heim de Balsac (1936), Hüe & Étchécopar (1970), Jennings (1995), Keith *et al.* (1992), Lees-Smith (1986), Mackworth-Praed & Grant (1960, 1970), Morel & Morel (1984), Morgan & Palfery (1986), Mukherjee (1995), Newton & Newton (1997), Nikolaus (1987), Porter *et al.* (1996), Ramadan-Jaradi (1988), Rietkerk & Wacher (1996), Ripley (1982), Roberts (1992), Shirihai (1996), Snow & Perrins (1998), Vaurie (1959), Williams *et al.* (1999).

55. Grey-backed Sparrow-lark

Eremopterix verticalis

French: Moinelette à dos gris **German**: Graurückenlerche **Spanish**: Terrera Dorsigrís
Other common names: Grey-backed Finch-lark

Taxonomy. *Megalotis verticalis* A. Smith, 1836, Colesberg, Orange River, Northern Cape, South Africa.

Relationships uncertain; suggested as forming a superspecies with *E. signatus*, sometimes expanded to include also *E. nigriceps* and *E. leucopareia*. Precise breeding ranges of races inadequately understood; birds breeding in SW Zambia of uncertain racial identity; presumably include *harti*, but all four races recorded in that country. Four subspecies recognized.

Subspecies and Distribution.

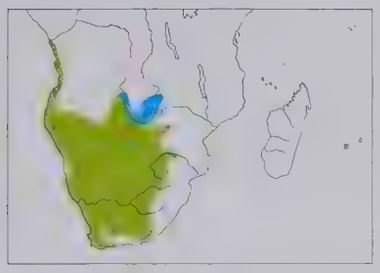
E. v. damarensis Roberts, 1931 - coastal Angola (including Cabinda), Namibia, W Botswana and NW South Africa; periodic eruptions E to W Zambia and W Zimbabwe.

E. v. harti Benson & Irwin, 1965 - W Zambia.

E. v. khama Irwin, 1957 - NE Botswana and W Zimbabwe; periodic eruptions NE to W Zambia.

E. v. verticalis (A. Smith, 1836) - SW Zimbabwe, SE Botswana and South Africa (except NW); periodic eruptions N to W Zambia.

Descriptive notes. 12-13 cm; 13-21 g. Small, sexually dimorphic lark with appearance like that of a finch (Fringillidae). Adult male nominate race has black head, large white ear patch extending to nape, variable white patch on hindcrown; upperparts dark grey with paler feather margins (general colour varies with wear), wing-coverts and tertials with broad pale margins, appearing scalloped in fresh plumage; tail dark brown, central feathers broadly fringed paler and pattern matching that of upperparts, outer feathers edged and tipped white; chin and entire underparts black, except for narrow white stripe extending from neck down breast side; blackish underwing; eyes brown; bill pale whitish-grey, sometimes with bluish tint; legs pale grey. Female is much duller, browner, rather nondescript, but with blackish belly patch and underwing-coverts, duller, more horn-coloured bill, legs fleshy grey to dull flesh; distinguished from females of congeners by generally paler plumage combined with dark belly patch. Juvenile is browner above than female, with pale feather fringes, face buffish-chestnut, throat and breast buff, mottled darker, belly patch smaller



and browner; male acquires mottled immature plumage in post-juvenile moult 1-2 months after fledging, adult plumage acquired after first complete moult at c. 1 year. Races differ chiefly in upperpart colour and width of pale fringes of wing-coverts and tertials, but variable (general colour changes according to degree of wear): *damarensis* is paler than nominate, male upperparts sandy grey, buffish margins, female more buffish overall, reddish-brown edgings above; *khama* male is pale greyish-white above, whitish margins indistinct, wing-coverts and secondaries with broad white margins, female very pale grey-brown above, whitish below; *harti* is somewhat darker than previous, less greyish above, wing-covert margins less obvious. Voice. Male song, typically in aerial display, a series of simple notes, "shreep shreep shrup-up shreep-eep". Flight call a soft "pink", cleaner and higher-pitched than that of *E. australis*; "prink" when flushed from nest; soft "tsee-ree" feeding call to chicks.

Habitat. Grassy plains in semi-arid regions; also sparse shrublands, fallow fields and cereal croplands in Western Cape (South Africa). In the Kalahari prefers pale calcrete flats and riverbeds to redder sands. Also occurs in variety of more mesic grasslands during irruptions outside its core range. Mostly open lowland plains; scarce in hilly areas.

Food and Feeding. Food mostly seeds; also small amounts of green vegetation (grass shoots, sprouting grass seeds) and insects, including termites (Isoptera), grasshoppers (Acrididae), ants, beetles (Coleoptera). In one study, stomach contents 91% seeds, with grass seeds predominating, lesser amounts of forb seeds. Stomachs of specimens obtained immediately after a rain event contained large numbers of *Hodotermes* harvester termites, this presumably linked to an emergence of winged alates. One pair observed to feed on large number of brown locust hoppers. Chicks fed mostly with insects, especially harvester termites. Forages on ground, mostly by picking seeds from surface, occasionally digging with bill; in loose flocks of up to 100 individuals, sometimes also including other members of genus, as well as *Spizocorys starki*. Seeks shade during heat of day; faces into breeze, with wings drooped, on elevated perch to reduce heat stress, may also fly with dangling legs as cooling mechanism. Regularly drinks water, but some flocks apparently survive without access to water. Metabolic rate typical for species' size, but rate of evaporative water loss significantly lower than expected. Captive individuals maintained constant mass on a diet of dry millet seeds, without water (or with only 0·3 M salt solution) to drink; water-deprived birds produced faecal pellets with 52% water.

Breeding. Associated with rains; laying 2-4 weeks after sufficient rainfall, but interval between rain and onset of breeding varies seasonally (shortest in summer months, longest in winter), related to period needed for grass seeds to mature, also inversely related to amount of rain falling in the first shower; duration of breeding (3-27 weeks) is a function of total amount of rainfall over a few weeks, at least 20-30 mm of rain needed to stimulate some breeding in the Karoo and Kalahari, less than 40 mm to stimulate widespread breeding, rain required also varies seasonally (more needed in summer than in winter, when evaporative losses are reduced); abundance of *Stipagrostis* awns (for lining nests) may be indicator of suitable breeding conditions in N & NW Karoo; breeding more seasonal in SW. Monogamous; solitary, but in favourable areas adjacent nests may be only a few metres apart. Male performs aerial display 10-20 m above ground, circling and calling, sometimes with dangling legs, then drops steeply to ground; also displays on ground with head erect, tail cocked, to mate; during breeding season male fairly often perches on fence wires (female seldom does), suggesting that this behaviour possibly linked to territorial behaviour. Nest built by female, taking 4-5 days, accompanied on some material-gathering trips by male, a shallow scrape in ground with foundation of small stones or hard clods of soil, lined with fine grass leaves, stems and awns, sometimes also wool; where ground hard the foundation is extensive, allowing cup to be sunk into it, in one extreme case nest contained 235 stones with total weight 454 g (largest stone 8 g); site usually on SE or E side of a bush or grass tuft, providing shade from afternoon sun, although winter nests may be in exposed situation. Clutch 2-3 eggs, rarely 1 or up to 5; clutch size changes rapidly with environmental conditions, e.g. mean increased from 2·3 in week before a heavy downpour to 3·2 in week after; laying interval 1 day; incubation usually from first egg, by both sexes roughly equally, male more in afternoons, period 9-13 days (average 9·6 days); eggshells apparently removed by parents, both of which brood and feed chicks, female spends roughly twice as much time in brooding; after feeding, parents wait for chicks to deposit faecal pellet on nest rim, remove this and drop it 3-4 m away; chicks leave nest from day 7, most after 8-10 days, duration of nestling period longer (mean 10·5 days) when heavy rain, typically incited to leave by female, often in response to approach of an intruder; no specific distraction displays, but adults often hover near nest if prevented from returning to it by an observer; young able to fly after 15-20 days. Breeding success generally low owing to high rate of nest predation, primarily by mammals such as mongooses (Herpestidae), sometimes also severe chick mortality caused by heavy rain (77 mm of rain over 2 days killed 59% of chicks); only 47% of clutches survive to due hatch date, 86% of eggs reaching that date hatch, and 60% of broods survive to fledging, giving overall breeding success of 23% and mean of 0·54 young fledged per attempt; predation rates were greater for nests with 2-egg or 3-egg clutches than for those with either 1 or 4 eggs; success in the Kalahari was even lower, only 14% of nests producing fledged young. Maturity probably at 1 year; some males breed in immature plumage.

Movements. Nomadic within core range, with regular dry-season movement to more mesic areas on periphery of range. Mostly a summer breeding visitor in agricultural lands of Western Cape (South Africa). Rainfall seems to be significant trigger for movement within core range, but unclear whether there is regular E-W movement linked to differences in seasonal rainfall between the Kalahari and the Karoo. In areas with relatively little grass, irruptions not solely linked to local rainfall, and may be mediated by absence of suitable conditions in other areas; massive irruption into SW Zambia in 1964 apparently resulted from exceptionally cold conditions farther S. All four races recorded in Zambia, where periodic irruptions of nominate from S, *khama* from SW and *damarensis* from W; last race also reaches W Zimbabwe in some years.

Status and Conservation. Not globally threatened. Common in much of range; locally superabundant after good rains. Breeding densities reach 2-6 pairs/ha in the Namib and 10-15 pairs/ha in the Karoo. Occurs in loose flocks, each seldom containing more than 100 birds, but often many thousands of individuals within one general area; average flock size in the Karoo 35 birds, with average density in open shrubland up to 28 birds/km^2.

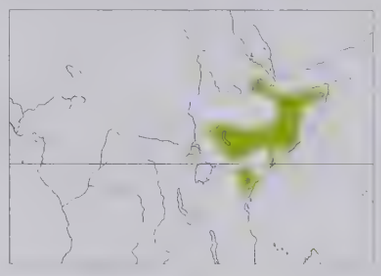
Bibliography. Bannerman (1953), Benson & Irwin (1965), Benson *et al.* (1971), Clancey (1969b), Dean (1997, 2000), Dean & Milton (2001), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), James & Brooke (1971), Keith *et al.* (1992), Lloyd (1998, 1999, 2004), Lloyd *et al.* (2000), Mackworth-Praed & Grant (1962, 1970), Maclean (1970a, 1970b, 1993a), Macmillen (1990), Penry (1994), Sinclair & Hockey (1996), de Swardt (1996), Tarboton (2001), Willoughby (1968, 1971).

56. Chestnut-headed Sparrow-lark

Eremopterix signatus

French: Moinelette d'Oustalet **German**: Harlekinlerche **Spanish**: Terrera Señalada
Other common names: Chestnut-headed Finch-lark

Taxonomy. *Pyrrhulauda signata* Oustalet, 1886, Somalia.
Relationships uncertain; suggested as forming a a superspecies with *E. verticalis*, sometimes expanded to include also *E. nigriceps* and *E. leucopareia*. Race *harrisoni* weakly differentiated, perhaps indistinguishable from nominate. Two subspecies tentatively recognized.
Subspecies and Distribution.
E. s. signatus (Oustalet, 1886) - E & S Ethiopia, N, C & S Somalia and E Kenya.
E. s. harrisoni (Ogilvie-Grant, 1900) - extreme SE Sudan and NW Kenya.



Descriptive notes. 11-12 cm; 16 g. Small, sexually dimorphic lark resembling a finch (Fringillidae). Adult male is strikingly marked, head and breast boldly patterned black and white, hindcrown dark chestnut (appearing blackish in poor light); black areas of face, upper breast and collar sometimes washed chestnut; white nape bordered black below; upperparts sandy brown, wing-coverts with pale fringes, secondaries, tertials and central tail feathers wth buffy margins, base and outer web of outer rectrix white; breast side and flanks white, rest of underparts black; underwing dark brown (appearing blackish in flight); eyes brown; bill greyish-white; legs pale flesh-brown. Female is much duller, mostly dull brown above, rufous-buff supercilium, dirty buff underparts variably mottled on breast, has dark stripe along central belly (often concealed or hard to observe in field); distinguished from female *E. nigriceps* by generally darker upperparts, from female *E. leucopareia* by buffier upperparts, heavier bill, white in outer tail. Juvenile resembles female but paler, with buff margins of upperpart feathers, appearing scaly, face more buffy, breast washed buffy with darker brown streaks; juvenile male moults into an intermediate immature plumage, similar to female *E. leucopareia* but paler above, with heavier bill and usually whitish cheek patches. Race *harrisoni* is colder grey-brown above than nominate. Voice. Male has short twittering song; also reported as giving series of rising, mournful notes as well as piping notes, similar to those of Lesser Striped Swallow (*Hirundo abyssinica*). Flight call a sharp "chip" or "chip-up".

Habitat. Semi-arid and arid plains with grassland, savanna, and clearings in open woodland, from sea-level to 1500 m; in areas with with annual rainfall 75-500 mm.

Food and Feeding. Mostly grass seeds; chicks fed with at least some insects. Forages on the ground. In flocks of up to 40 individuals outside breeding season, sometimes in flocks with *E. nigriceps* and *E. leucotis*; seldom with *E. leucopareia*.

Breeding. Apr-Jul. Probably monogamous; nests singly. Male performs aerial display 6-10 m above territory. Nest an open cup built from dry, fibrous grass in shallow scrape in ground, usually at base of a grass tuft; one nest in Somalia was within 20 m of a nest of *E. nigriceps*. Clutch 3-5 eggs; nothing known about parental duties or incubation and fledging periods.

Movements. Resident and locally nomadic. Apparently largely sedentary in core of range, but subject to occasional irruptions at periphery (e.g. in coastal dunes in S Kenya).

Status and Conservation. Not globally threatened. Generally fairly common, but usually outnumbered by *E. nigriceps*. Can be locally abundant when conditions are favourable. Irruptions into Tsavo East National Park, in S Kenya, during 1970s resulted in establishment of a small resident population.

Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Bennun & Njoroge (1999), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Lack (1985), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Nikolaus (1987), Shirihai (1996, 1999), Short *et al.* (1990), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

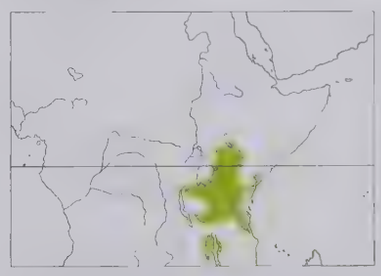
57. Fischer's Sparrow-lark

Eremopterix leucopareia

French: Moinelette de Fischer **German**: Braunscheitellerche **Spanish**: Terrera Cariblanca
Other common names: Fischer's Finch-lark

Taxonomy. *Coraphites leucopareia* G. A. Fischer and Reichenow, 1884, Little Arusha, Tanzania.
Relationships uncertain. Sometimes considered to form a superspecies with *E. griseus*, but range is largely parapatric with that of *E. signatus*; has also been considered to form a superspecies with latter, *E. nigriceps* and *E. verticalis*. Plumage varies clinally, on average darker in S, but insufficient to warrant naming of geographical races. Monotypic.

Distribution. NE Uganda and Kenya S to extreme NE Zambia, N Malawi and extreme NW Mozambique.



Descriptive notes. 11-12 cm. Small, sexually dimorphic lark with appearance like that of a finch (Fringillidae); bill slightly more slender compared with those of congeners. Adult male is distinctive, has tawny-rufous (rarely greyish) crown and nape contrasting with white ear-coverts, and black eyestripe, face, throat, neck side and stripe down centre of breast and belly; upperparts grey-brown with paler feather margins, these especially obvious on wing-coverts; flight-feathers darker brown, tertials and outer tail edged rufous; underparts (except central black band) whitish, with variable rufous wash on side of breast; eyes brown; bill pale grey, slightly darker tip; legs pale grey-brown to pinkish-flesh. Female is much duller, crown and cheeks brownish with darker streaks, supercilium and side of neck buffy rufous, distinctive narrow black stripe down centre of breast and belly; distinguished from females of congeners mainly by black stripe below, from immature male *E. signatus* by darker cheeks and less heavy bill. Juvenile is like female, but with pale buff nape patch, pale feather tips on upperparts and wing-coverts, smaller belly stripe often barely visible; juvenile male moults into an intermediate, mottled immature plumage.

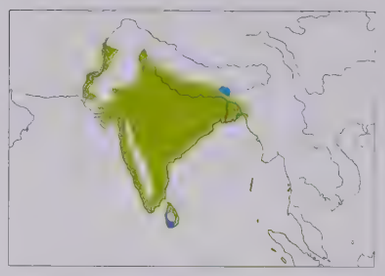
Voice. Typical call a rather sharp "tsee tsit"; song has added notes, resulting in rather tuneless warble not unlike that of a sparrow (*Passer*).
Habitat. Semi-arid grassland and bare areas, including bare fields, roads and airstrips.
Food and Feeding. Mostly grass seeds, with a few insects; survives well in captivity on a diet of seeds. Birds breeding at Magadi, in S Kenya, take large numbers of adult and larval flies (Diptera) associated with soda streams. Forages on the ground, in small flocks; picks food items from the soil or directly from plants. Nesting birds often join feeding flocks in late afternoon.
Breeding. Season protracted, nesting mostly during Feb-Jul rainy season in N and during Apr-Aug dry season in C & S. Monogamous; breeds singly or in loose "colonies". Male performs high aerial display, also sings from ground; approaches female while holding chestnut crest erect. Nest an open cup, lined with dry grass and rootlets, built in shallow scrape in ground, usually at base of a grass tuft or other feature (including shrub, rock or even a post) but fully exposed to midday sun; where ground hard, builds a foundation of pebbles or clods of earth in which to make a depression. Clutch 2-3 eggs, rarely 4; incubation by both parents, contributing roughly equal shares, and changing over regularly during heat of day, then standing over eggs to shade them, also regularly turning eggs, apparently to prevent them from overheating; nest often left unattended in early morning and evening; incubation period c. 12 days; incubating and brooding birds raise the feathers to shed heat; fledging period c. 15 days, although chicks probably leave nest before this time.
Movements. Resident or local nomad; perhaps regular migration in S of range, where it visits Malawi and adjacent Zambia in winter dry season.
Status and Conservation. Not globally threatened. Fairly common to common. Up to 20 breeding pairs in 0·5 ha in areas where conditions favourable; usually occurs in flocks, even when breeding. Range may have contracted in NE; in Kenya, occurred in Tsavo East National Park until 1960s, but now replaced there by *E. signatus*. In contrast, possibly expanding its range in S, becoming more common in Malawi; first recorded in NE Zambia in 1970s, despite frequent searches prior to this time.
Bibliography. Aspinwall (1977a), Benson & Benson (1977), Byaruhanga *et al.* (2001), Dowsett (1983), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Karcher & Medland (1989), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1962), Medland (1995), Reynolds (1977), Short *et al.* (1990), van Someren (1956), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

58. Ashy-crowned Sparrow-lark

Eremopterix griseus

French: Moinelette croisée **German**: Grauscheitellerche **Spanish**: Terrera Coronigrís
Other common names: Ashy-crowned Finch-lark, Black-bellied Sparrow-lark/Finch-lark, Ceylon Finch-lark

Taxonomy. *Alauda grisea* Scopoli, 1786, no locality = Gingee, South Arcot district, Tamil Nadu, India. Relationships uncertain. Sometimes considered to form a superspecies with *E. leucopareia*, but often regarded as close to *E. nigriceps*. Monotypic.
Distribution. Pakistan (R Indus plains), and from S Himalayan foothills E to E Bangladesh and S to S tip of India, also Sri Lanka.
Descriptive notes. 11-12 cm. Small, sexually dimorphic lark with appearance superficially like that of a finch (Fringillidae). Adult male has pale greyish-brown forehead and crown (forehead often slightly paler, crown indistinctly streaked), black lores and eyeband, pale greyish-brown or pale buffish ear-coverts, grey-brown nape; upperparts grey-brown, lightly streaked, upperwing-coverts, tertials and flight-feathers darker with pale edges, pale tips of especially median coverts; underwing-coverts blackish; tail blackish-brown or dark grey-brown, central feather pair paler, outermost pair dusky grey-brown, outer two pairs with off-white outer web; throat, neck side and underparts blackish, narrow whitish band on breast side and flank; bill grey; legs pinkish. Differs from *E. nigriceps* in less black on head, duskier ear-coverts. Adult female lacks black on the head and underparts (but has blackish-brown underwing-coverts), is grey-brown and faintly streaked above, with indistinct buffish supercilium, pale crescent behind grey-brown ear-coverts, buffish below, breast indistinctly streaked dark; distinguished from very similar female *E. nigriceps* (of race *melanauchen*) by marginally darker, browner and more distinctly streaked upperparts, darker and more buffish underparts, on average diffuser and broader streaks below (often also on flanks), generally slightly more contrasting head pattern. Juvenile resembles female, but with whitish fringes of scapulars and upperwing-coverts; some first-adult males show reduced black on head and underparts. Voice. Song, mainly in high flight, also from ground or low perch, strophes of quickly repeated short notes, e.g. "plü-plü-plü-plü-plü-plü-plü-plü-plü-plü-plü-plüü" or "drrü-drrü-drrü-drrü-drree-drree-drree", strophes interspersed with somewhat melancholy, drawn-out, whistled "eeeeeeeee" (given also during descent from flight, also from ground); alternatively, short strophes of slightly more varied, often quickly repeated, whistles, e.g. "eee-peee, pee-pee-pee". Commonest call rather faint, soft, rolling "djürr(i)t".



Habitat. Dry open habitats with scattered low vegetation, from sea-level to c. 1000 m. Generally completely segregated by habitat from *E. nigriceps* (of race *melanauchen*) where their ranges overlap.
Food and Feeding. Poorly studied; diet seeds, e.g. of grasses and forbs (Chenopodiaceae), and insects, e.g. small beetles (Coleoptera). Forages on ground.
Breeding. Little studied. Breeds more or less throughout year, but mainly Feb-Sept in peninsular India and May-Jun in Sri Lanka; probably at least sometimes two broods. Male song flight high up, intermittently dropping down and rising in deep undulation, final descent very deeply undulating. Nest, built mainly or entirely by female, a depression on ground, lined with fine grass, rootlets, hair or feathers, and frequently surrounded by gravel, generally sheltered by stone, clod of earth or small bush. Clutch 2-3 eggs; incubation by female, or possibly by both parents; chicks fed by both sexes, leave nest before capable of flying.
Movements. Sedentary or slightly nomadic.
Status and Conservation. Not globally threatened. Locally common. No population estimates. Present in numerous protected areas, e.g. Ranthambhore Sanctuary (India) and Kosi Tappu Wildlife Reserve (Nepal).
Bibliography. Ali (1969, 1996), Ali & Ripley (1987), Alström (2002), Alström *et al.* (2004), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Khan (1988), Law (1924), Mukherjee (1995), Pätzold (1994, 2003), Rasmussen & Anderton (2004), Ripley (1982), Roberts (1992), Santharam (1980), Shukla & Shrivastava (1985), Stuart Baker (1926, 1935), Vaurie (1951a).

PLATE 58 ➤


59
ssp arenicolor
ssp zarudnyi
ssp cinctura
60
ssp mya
61
ssp annae
ssp kollmanspergeri
ssp deserti
ssp iranica
ssp insularis
62
ssp calandra
63
64
typical morph
ssp psammochroa
rufous morph
65
66
67
68
PLATE 58
inches 4
cm 10

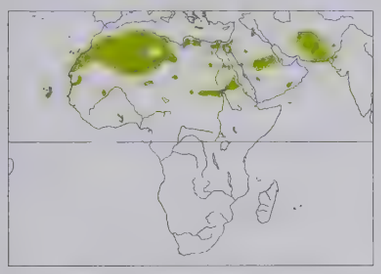
Genus *AMMOMANES* Cabanis, 1851

59. Bar-tailed Lark

Ammomanes cinctura

French: Ammomane élégante **German**: Sandlerche **Spanish**: Terrera Colinegra
Other common names: Bar-tailed Desert Lark/Sand Lark, Black-tailed Lark/Desert Lark/Finch-lark

Taxonomy. *Melanocorypha cinctura* Gould, 1839, São Tiago, Cape Verde Islands.
Has been thought to form a superspecies with *A. phoenicura*, and in the past considered conspecific. Paler and smaller birds from Chad (Ennedi) and Sudan sometimes separated as race *pallens*, but appear indistinguishable from *arenicolor*. Three subspecies recognized.
Subspecies and Distribution.
A. c. cinctura (Gould, 1839) - Cape Verde Is (São Tiago, Maio, Boavista, Sal).
A. c. arenicolor (Sundevall, 1850) - Sahara Desert from S & E Morocco E to Libya (Cyrenaica) and Egypt (including Sinai Peninsula) and S, discontinuously, to W & SE Mauritania, WC Mali, C Niger, N & E Chad and C & NE Sudan; also Middle East (S Israel, Jordan, Iraq) and Arabian Peninsula.
A. c. zarudnyi Hartert, 1902 - E Iran E to S Afghanistan and S Pakistan.



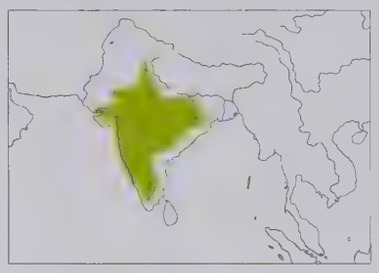
Descriptive notes. 14 cm; 14-23 g. Small, neat, rather plain lark with relatively small and rounded head, short bill, long primary projection (about half length of tertials), relatively long outer primary (1 mm less to 5 mm more than primary coverts), rather short and slender tarsus; hind claw short (5·3-6·8 mm), slightly curved. Nominate race is mostly tawny rufous above, faint buffish supercilium; flight-feathers and tail orange-rufous, broad blackish tips of primaries (contrast with tertials when wings folded), well-demarcated black terminal tailband; pale whitish-buff below, breast washed orange; bill sandy pink; legs sandy horn to pale brown. Sexes alike. Juvenile is similar to adult, but black on tail and primaries less defined (sometimes lacking on primaries), outer primary broader-tipped and longer (extends 6-9 mm beyond tips of primary coverts). Race *arenicolor* is paler than nominate, more sandy pinkish, black on tail and primaries less extensive; *zarudnyi* is much greyer above, less white below, with broader black tailband. Voice. Male song, often in aerial display, short whistles, "see-oo-lee" or "cher-ho-hee", first notes lower in pitch and often audible only at short distance, the last one high, pure and squeaky; repeated rhythmically at intervals of c. 1·5 seconds. Calls include dry, purring "prrit" or "cherr" and thin, descending "peeyu" or "see-oo".
Habitat. Most desert-adapted lark of Palearctic. Inhabits mainly deserts with less than 100 mm annual rainfall, also semi-deserts, in flat or gently undulating terrain, stone or sandy soils, and very sparse or almost no vegetation cover. In W part of Sahara prefers stone-clay *regs* (gravel plains with mixed sandy areas) with grasses, and small depressions in the terrain; common in semi-arid savanna. Generally lowlands; may reach 1700 m in Pakistan after breeding season.
Food and Feeding. Seeds, to lesser extent other plant material, and insects. In Cape Verde Is mostly small seeds and grasshoppers (Acrididae); in Western Sahara during breeding season small seeds (mainly of *Aizoon*) and insects; in Algeria seeds. Diet of chicks insects. Forages on ground; in small flocks when not breeding. Searches ground, walks and runs sequentially; also digs for items.
Breeding. Season determined by rainfall; lays Jan-Apr in N Africa, Sept-Jun in Cape Verde Is, depending on dry period; mostly mid-Mar to mid-Apr in Middle East; some pairs double-brooded. Male song flight steeply undulating, notes uttered in phase with undulations, flightpath meandering but roughly circular, ending with steep descent to ground. Nest built by female, unknown if male helps, a shallow depression on ground beneath a rock or beside a stone, lined with some vegetation, rampart of small pebbles, interior diameter 7-8 cm, oriented to N. Clutch 2-4 eggs, rarely 5 (mode 2 in Cape Verde Is, 3 in Algeria and Tunisia); incubation by both sexes, 12-14 days; chicks cared for and fed by both parents, leave nest at c. 11 days, fledging 13-15 days.
Movements. Resident; dispersive winter movements in search of less arid areas recorded in N Africa, especially during drought periods; nomadic over short distances in Middle East and Arabian Peninsula. Occasional longer dispersal indicated by records of vagrants in Canary Is, Balearic Is (Mallorca), Italy (both peninsula and Sicily), Malta and Cyprus.
Status and Conservation. Not globally threatened. Abundance varies widely within rather large but fragmented range. In Cape Verde Is abundant on Sal, Boavista and Maio, rare on Fogo; in Mauritania local in N and widespread and fairly common in S; common in S Morocco and S Tunisia; abundant in sublittoral zone of Western Sahara, becoming progressively scarce inland; in Libya widespread in Tripolitania and common in Cyrenaica; locally common in Egypt; frequent in WC Mali and in N Niger (Ténéré); fairly common in N Sudan. Fairly common in parts of Israel, mainly W Negev and Arava Valley, estimated total for whole country in 1980s 400-500 pairs, but declining; widely distributed but uncommon in Jordan (commonest lark in hammada areas of Azraq); widespread and often common in Saudi Arabia, where common to very common in C deserts and Gulf area); locally common and widespread in S Baluchistan. Elsewhere, only few records from Syria, scarce and irregular in Kuwait (first confirmed breeding 1996), and recorded in Abu Dhabi (1992); reported from S Turkey (but records possibly relate to *A. deserti*) and once from N Yemen.
Bibliography. Allouse (1953), Aspinall (1996), Bannerman (1953), Bannerman & Bannerman (1968), Blondel (1962), Borrow & Demey (2001), Bourne (1955), Brosset (1956, 1961), Bundy (1976), Bundy & Warr (1980), Castell (2000), Cave & Macdonald (1955), Clarke (1980), Cowan & Brown (2001), Cowan & Newman (1998), Cramp (1988), Dean (1980), Dickinson & Dekker (2001a), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dupuy (1969), Étchécopar & Hüe (1964), Fairon (1975), Gallagher & Woodcock (1980), Gilet (1960), Giraudoux *et al.* (1988), Goodman *et al.* (1989), Grimmett *et al.* (1998), Hall & Moreau (1970), Hazevoet (1995), van Heezik & Seddon (1999), Heim de Balsac (1936), Heim de Balsac & Mayaud (1962), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Iapichino & Massa (1989), Isenmann & Moali (2000), Jennings (1980b, 1981, 1995), Keith *et al.* (1992), Ledant *et al.* (1981), Lees-Smith (1986), Lunais (1984), Mackworth-Praed & Grant (1960, 1970), Martín & Lorenzo (2001), Mayaud (1985), Meinertzhagen (1951, 1954a), Morris (1992), de Naurois (1987), Newton & Newton (1997), Niethammer (1955b, 1963b), Nikolaus (1987), Paz (1987), Rietkerk & Wacher (1996), Ripley (1982), Roberts (1992), Roselaar (1995), Schönwetter (1979), Shirihai (1994, 1996), Shirihai *et al.* (1990), Snow & Perrins (1998), Sultana & Gauci (1982), Svensson *et al.* (1999), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Valverde (1957), Vaurie (1951a, 1959), Walker (1981b), Wallace (1983, 1984), White (1961a), Williams *et al.* (1999).

60. Rufous-tailed Lark

Ammomanes phoenicura

French: Ammomane à queue rouge **German**: Rotschwanzlerche **Spanish**: Terrera Colirroja
Other common names: Rufous-tailed Desert Lark/Finch-Lark

Taxonomy. *Mirafra phoenicura* Franklin, 1831, Vindhya Hills between Benares and Gurrah Mundela on the Narbudda, India.
Has been thought to form a superspecies with *A. cinctura*, and in the past considered conspecific. Is, however, more similar morphologically, vocally and in habitat choice to *A. deserti*, and likely to be more closely related to that species. Birds from S India often separated as race *testacea*, but appear indistinguishable from other populations. Monotypic.
Distribution. NE Pakistan (probably irregular) and most of India (except NW, N & NE).



Descriptive notes. c. 16 cm. Rather robust and quite strong-billed, fairly dark and featureless lark. Adult is plain dark brown-grey above, faint paler supercilium; wings dark grey-brown with indistinct paler edges; uppertail-coverts and tail rufous, tail with broad dark terminal bar; throat and upper breast rufous-buff, rest of underparts rufous, dark streaking on breast, underwing mostly deep rufous; iris dark brown; bill mainly dark grey above, pale greyish-pink below with dark tip; legs pinkish to dull fleshy brown, often duskier on toes. Sexes similar, female on average smaller than male. Juvenile differs from fresh-plumaged adult in having slightly more distinct pale buffish-rufous fringes above. Voice. Song, from ground or low perch such as rock, or in low flight, 2-3 simple notes, given one at a time in seemingly random order with short pauses in between, e.g. "juu, juuh, tchérrrwe, tchérrrwe, tchérrre ... juuh ... tchérrrwe ...": sometimes short warbling strophes intermixed. Commonest call a subdued, soft "djup". Vocalizations resemble those of *A. deserti*.
Habitat. Dry, open habitats with sparse vegetation; often found together with other species, such as *Eremopterix griseus*.
Food and Feeding. Food poorly studied: seeds, for instance of grasses and cereals, and invertebrates, e.g. beetles (Coleoptera). Forages on ground.
Breeding. Feb-May, chiefly Mar and Apr. Male song flight of brief duration, at low level, undulating on horizontal flightpath, similar to that of *A. deserti*. Nest, built by both sexes, a depression on ground, generally sheltered by clod of earth, tuft of grass or other plant, lined with fine grass and often surrounded by pebbles, small sticks, etc. Clutch 2-4 eggs; uncertain whether incubation by female alone, but both sexes feed young; incubation and fledging periods not documented.
Movements. Mostly sedentary; apparently somewhat nomadic in non-breeding season.
Status and Conservation. Not globally threatened. Locally common; common in N part of Indian range. No population estimates. Status in Pakistan uncertain; possibly only erratic visitor during monsoon season. Recorded in W terai of S Nepal, where apparently very rare and local; breeding status requires confirmation.
Bibliography. Ali (1996), Ali & Ripley (1987), Alström *et al.* (2004), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Gokula & Vijayan (1997), Grimmett *et al.* (1998), Kalsi (1998), Mukherjee (1995), Pätzold (1994, 2003), Rasmussen & Anderton (2004), Ripley (1982), Roberts (1992), Srinivasulu & Srinivasulu (1997), Stuart Baker (1926, 1935), Vaurie (1951a).

61. Desert Lark

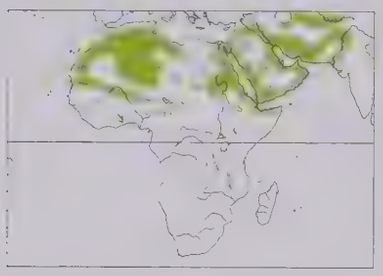
Ammomanes deserti

French: Ammomane isabelline **German**: Steinlerche **Spanish**: Terrera Sahariana
Other common names: Desert Finch-lark, Sand Lark(!)

Taxonomy. *Alauda deserti* M. H. K. Lichtenstein, 1823, Aswan, upper Egypt.
Was in the past thought to form a superspecies with *Ammomanopsis grayi*, but apparent similarities now attributed to convergence. Similar morphologically, vocally and in habitat choice to *A. phoenicura*, and likely to be more closely related to that species. Geographical variation complex, and numerous races named mainly on basis of plumage coloration, which in turn seems strongly related to predominant soil colours; pale and dark birds live side by side in some areas, e.g. Algeria (Hoggar Mts), Nile Valley and Jordan. Although over 30 races have been described, many now usually merged with others, often in rather arbitrary way, for example: *bensoni* (grey-coloured) and *janeti* (brown) from Hoggar Mts have been included variously in *geyri* or *whitakeri*; *intermedia* (from El Golea area of Algeria) in *mya* or *algeriensis*; *mirei* (from Tibesti Mts, in Chad) in nominate race, *whitakeri* or *algeriensis*; *monodi* (from the Iriji, in Mauritania) in *payni* or *geyri*; *katharinae* (from Sinai Peninsula) in nominate or *isabellina*; *hijazensis* (from Arabian W coast) in *samharensis* or *isabellina*. In addition, *fratercula* (described from Dead Sea region) and *borosi* (from lower Nile Valley in EC Egypt) considered inseparable from *isabellina*. Races *iranica* and *phoenicuroides* said to intergrade widely in Afghanistan and Pakistan (in region from Kandahar E to Quetta). Thorough review of taxonomy required. Twenty-four subspecies tentatively recognized.
Subspecies and Distribution.
A. d. payni Hartert, 1924 - Morocco (S of High Atlas Mts) and nearby SW Algeria.
A. d. algeriensis Sharpe, 1890 - N Algeria (N of 31° N), Tunisia and NW Libya (W Tripolitania).
A. d. mya Hartert, 1912 - C Algeria (Sahara between 30° N and 27° N).
A. d. geyri Hartert, 1924 - Mauritania E to S Algeria and NW Niger (Aïr Massif).
A. d. whitakeri Hartert, 1911 - SE Algeria (including Hoggar Mts) and SW Libya, perhaps also NW Chad (Tibesti Mts).

On following pages: 62. Thick-billed Lark (*Ramphocoris clotbey*); 63. Calandra Lark (*Melanocorypha calandra*); 64. Bimaculated Lark (*Melanocorypha bimaculata*); 65. Tibetan Lark (*Melanocorypha maxima*); 66. Mongolian Lark (*Melanocorypha mongolica*); 67. White-winged Lark (*Melanocorypha leucoptera*); 68. Black Lark (*Melanocorypha yeltoniensis*).

A. d. kollmanspergeri Niethammer, 1955 - NE Chad (Ennedi Mts) and W Sudan (Darfur).
A. d. isabellina (Temminck, 1823) - N Egypt (from W of Nile Valley and Dakhla Oasis) E to S & E Israel, S Jordan, NW Saudi Arabia and S Iraq (E to R Tigris).
A. d. deserti (M. H. K. Lichtenstein, 1823) - E Egypt (E of R Nile to Red Sea) S to Sudan.
A. d. erythrochroa Reichenow, 1904 - W Chad (Ndjamena) E to N Sudan (Dongola S to Kordofan).
A. d. samharensis Shelley, 1902 - Red Sea coasts of Sudan, Eritrea (S to Mits`iwa) and Arabian Peninsula (S to Yemen border).
A. d. assabensis Salvadori, 1902 - Ethiopia and NW Somalia.
A. d. akeleyi Elliot, 1897 - highlands of N Somalia.
A. d. coxi Meinertzhagen, 1923 - S Turkey (Birecik), Syria and N Iraq (E to Samarra and Al Fallujah).
A. d. annae Meinertzhagen, 1923 - black lava deserts of Jordan (Azraq area), probably also extreme S Syria.
A. d. azizi Ticehurst & Cheesman, 1924 - NE Saudi Arabia (Al Hufuf area).
A. d. saturata Ogilvie-Grant, 1900 - black lava deserts of S Arabia (N Hijaz S to Aden).
A. d. insularis Ripley, 1951 - Bahrain, in Persian Gulf.
A. d. taimuri Meyer de Schauensee & Ripley, 1953 - Oman (Muscat area).
A. d. cheesmani Meinertzhagen, 1923 - E Iraq (E of R Tigres) to W Iran (S, W of Zagros Mts, to Persian Gulf near Bandar e Bushehr).
A. d. darica Koelz, 1951 - SW Iran (S Zagros Mts).
A. d. parvirostris Hartert, 1890 - W Turkmenistan (Kara-Bogaz-Gol S to Kopet Dagh and Atrak Basin).
A. d. orientalis Zarudny & Loudon, 1904 - NE Iran (N Khorasan), Turkestan (S Turkmenistan, S Uzbekistan, S Tadjikistan) and N Afghanistan.
A. d. iranica Zarudny, 1911 - E Iran (E of Tehran) E to SW Afghanistan and W Pakistan (Baluchistan).
A. d. phoenicuroides (Blyth, 1853) - SE Afghanistan, E Pakistan and adjacent NW India (extreme W Rajasthan).



Descriptive notes. 15-17 cm; c. 20-30 g. Medium-sized, robust lark with relatively large head, rather heavy bill (size changes geographically), longish wings with long primary projection, rather short tail; hind claw short (5-8 mm), slightly curved. Nominate race has short, indistinct buff supercilium, faint pale eyering, faint dark loral stripe; plain dark grey-brown to isabelline-brown above, rump tinged rufous; primaries with rufous outer webs, relatively long and broad outer primary (extends 4-15 mm beyond tips of primary coverts), tertials brownish; rufous-tinged tail feathers becoming blackish-centred towards tips, forming diffuse, triangular-shaped terminal band; throat whitish, underparts buffish, chest with diffuse streaking; iris dark brown; bill pale brown to yellowish, with darker grey-horn culmen and tip; legs dull flesh to greyish or yellowish-brown, often duller on toes. Sexes similar. Juvenile has narrow pale tips on wings and underparts, no blackish band on tail, outer primary longer than adult (11-18 mm beyond tips of primary coverts). Races vary markedly, especially in coloration, which often matches closely that of local soils (tending to be isabelline on sands, reddish to grey on rocks, and blackish in races living in black lava deserts), also in size, with comparatively long wing and long bill in C Sahara, long wing but shorter bill in E of range, and around them races of intermediate measurements, the others being comparatively small: *payni* is dark pinkish-grey to greyish-cinnamon above, darkish pink-buff below; *algeriensis* is much paler above and below than previous; *mya* is slightly paler and more sandy than last, lower back and rump less reddish, also larger in size, bill longer and stouter; *geyri* has generally darker, less sandy (more greyish-brown) plumage than last; *whitakeri* is darker than previous races, darker grey-brown above (only slight vinous tinge in fresh plumage), rump contrastingly rufous-cinnamon, buffish-brown with strong grey-brown streaks below, resembles nominate but much larger; *kollmanspergeri* is dark reddish-brown above, rufous below; *isabellina* is small and pale, generally light sandy to pale buff-brown with greyish or pale olive-grey tinge above, buff or creamy buff below, tail rufous with triangular black area at tip; *coxi* resembles previous but larger; *erythrochroa* is much paler than nominate, like previous but somewhat more reddish-yellow; *samharensis* is much darker, dark grey-brown above, sandy buff below, like nominate but darker throughout; *assabensis* closely resembles last, but marginally darker; *saturata* is very like previous two, but bill longer and stouter; *annae* is darkest race, very dark sooty grey to almost blackish; *akeleyi* is small, rather pale sandy grey above, rump dark pinkish-buff, pinkish-buff below; *azizi* is palest race, plumage creamy to pale isabelline; *insularis* is pale vinaceous grey above; *taimuri* resembles nominate; *cheesmani* is dark sandy brown with strong pink tinge above, pinkish-brown below; *iranica* is rather large, dark grey above, rump dull rufous, greyish-tinged buff-brown below, extensive grey spots and streaks from chin to breast, bill rather short but heavy; *darica* is slightly paler than last; *parvirostris* resembles previous but bill smaller; *phoenicuroides* is slightly browner than last, bill thinner; *orientalis* is large, rather pale, greyish sandy. VOICE. Male song, usually in flight, also from ground, far-carrying, melodious trilled whistles, "trreooee". Calls variable, including "chu" while foraging and "chee-lu" or "chee-wu" in flight, rapidly repeated when excited.

Habitat. Throughout range occurs in desert or semi-desert, mainly in lowlands. Found on rocky or stony hill slopes and flanking escarpments; avoids flat and sandy landscapes, although sometimes seen in undulating terrain with rocks and stones. Occurs along roadsides in some areas. Mostly lowlands, but to at least 2000 m in mountains, e.g. to above 2250 m in Egypt (Sinai); to 3000 m in Chad (Tibesti).

Food and Feeding. Mixed diet; small seeds and insects taken in highly variable proportions, according to areas and seasons. In Western Sahara during spring mainly seeds, but also small locusts (Orthoptera) and beetles (Coleoptera); in Algeria in spring, seeds; in Turkmenistan in spring and summer, approximately same frequency of seeds and invertebrates, the latter mainly caterpillars, grasshoppers (Acrididae) and beetles. Chicks fed mainly with insects, although some seeds recorded. Forages singly or in small groups, by walking on ground or among stones; frequently picks in dung; also recorded as feeding in shrubs, also as capturing flying insects. Hard food items broken against rock or other solid surface before swallowing. Drinks water, and large numbers may gather at water sources in summer; also able to survive without water.

Breeding. Lays Mar-May in N of range, Feb-Apr in S; Apr-Jun in Somalia; 1-2 broods per year. Monogamous; territorial. Male song flight rather brief, either horizontal between two eminences, with deep undulations, or steep ascent from and return to ground, with or without horizontal phase. Nest built by both sexes, on ground beside rock, grass tuft or small shrub, or in exposed site, made from grass stems and other fine plant material, lined with softer material, with rampart of small stones on exposed side, or surrounded by small stones when in open site. Clutch 1-5 eggs, smaller (2-3 eggs) in desert areas (mode 4 in Algeria and Tunisia, 3-4 in Israel); incubation by female alone, period 10-11 days, in Israel 13-14 days; chicks cared for and fed by both parents, nestling period c. 9-11 days, fledging 14-15 days. High rate of nest predation, c. 65 % in some areas.

Movements. Resident. Mainly sedentary, although some irregular movements recorded; altitudinal movements in mountain areas, with post-breeding descent to lower elevations. Accidental in Lebanon and Cyprus.

Status and Conservation. Not globally threatened. Widespread and common to locally common in many parts of extensive range. Common in much of African range, but apparently rather uncommon in Mauritania; some expansion to N recorded in E Morocco, and recently recorded also in Burkina Faso. Common in Arabia and most of Middle East; numerous in Israel (at least 10,000 pairs in 1980s) and Jordan, breeds in many places in interior Syria (with marked annual fluctuations), widespread in Iraq; small numbers in W Kuwait, breeding only in years of good winter rainfall; first found in Turkey in 1983, restricted to Birecik area. Common in Pakistan; uncommon in India.

Bibliography. Afik *et al.* (1991), Ali & Ripley (1987), Archer & Godman (1937-1961), Ash & Miskell (1998), Aspinall (1996), Bannerman (1953), Blondel (1962), Borrow & Demey (2001), Brooks, D.J. *et al.* (1987), Bundy (1976), Bundy & Warr (1980), Cave & Macdonald (1955), Clarke (1980), Cornwallis & Porter (1982), Cramp (1988), Dean (1980), Dementiev *et al.* (1970), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dupuy (1969), Elgood *et al.* (1994), Étchécopar & Hüe (1964), Fairon (1975), Fishpool *et al.* (2000), Flint & Stewart (1992), Gaston (1970), Gilet (1960), Goodman *et al.* (1989), Grimmett *et al.* (1998), Guichard (1955), Hall & Moreau (1970), Heath *et al.* (2000), van Heezik & Seddon (1999), Heim de Balsac (1936), Heim de Balsac & Mayaud (1962), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Isenmann & Moali (2000), Jennings (1980b, 1981), Keith *et al.* (1992), Ledant *et al.* (1981), Loskot (1989), Mackworth-Praed & Grant (1960, 1970), Mayaud (1985), Meinertzhagen (1951, 1954a), Nelson (1973), Newton & Newton (1997), Niethammer (1955b, 1963b), Nikolaus (1987), Orr (1970), Paludan (1959), Pasteur (1958), Pätzold (1993), Paz (1987), Ramadan-Jaradi & Ramadan-Jaradi (1999), Richardson (1990), Rietkerk & Wacher (1996), Ripley (1982), Roberts (1992), Roselaar (1995), Salvan (1968), Sharrock *et al.* (1989), Shirihai (1994, 1996), Shirihai *et al.* (1990), Shkedy & Safriel (1991, 1992a, 1992b), Snow & Perrins (1998), Svensson *et al.* (1999), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Tieleman *et al.* (1999), Urban & Brown (1971), Valverde (1957), Vaurie (1951a, 1955, 1959), Walker (1981a, 1981b), Wallace (1983, 1984), Welch & Welch (1984), White (1961a).

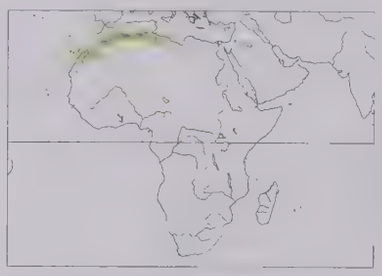
Genus *RAMPHOCORIS* Bonaparte, 1850

62. Thick-billed Lark
Ramphocoris clotbey

French: Alouette de Clot-bey **German**: Knackerlerche **Spanish**: Calandria Picogorda
Other common names: Clotbey(`s) Lark

Taxonomy. *Melanocorypha clot-bey* Bonaparte, 1850, Egyptian Desert.
Spelling of genus name often emended to *Rhamphocorys*. Monotypic.

Distribution. Deserts of NW Africa (Western Sahara, extreme N Mauritania, S & SE Morocco, W & interior N Algeria, C & S Tunisia, NW Libya), C Jordan and N Saudi Arabia.



Descriptive notes. 17-18 cm; male c. 52-55 g, female c. 45 g. Rather large lark with heavy head, huge deep-based bill laterally compressed distally (with small tooth in lower mandible that fits in notch in upper one), rather long and broad-based wings with narrow and pointed outer primary reduced (falls 4-12 mm short of primary-covert tips), shortish tail slightly forked; legs long, claws rather short (hind claw 6·7-8·5 mm) and slightly curved. Adult male has black face with distinct white patch on lower side, white chin; crown and upperparts pink-isabelline with grey tones, greater and median coverts with blackish centres and broad pinkish-brown edges, tertials blackish-brown with broad buff fringes; remiges mostly black, broad white tips of secondaries and inner primaries (striking wing pattern in flight, with broad white trailing edge); blackish subterminal tailband (more noticeable from below); pale buffish underparts strongly blotched black, black underwing with broad white trailing edge; iris dark brown; bill pale bluish-grey with darker tip; legs dull bluish-grey to pale straw. Female differs from male in having black areas of head less intense, more greyish, underparts less heavily blotched, bill pale horn with darker tip. Juvenile has only faint markings on head and underparts, bill less heavy, outer primary rounded at tip and longer (from 1 mm short of to 2 mm beyond tips of primary coverts). VOICE. Male song, from ground or in flight, a jingling series described both as soft and rather quiet medley of tinkling and warbling notes and as rapid stanza of twittering notes. Calls include sharp "prit", given commonly in flight, also "coo-ee", "co-ep", "wick-wick", "wheet-wheet-wheet", "sree", and similar; alarm a long, plaintive whistle, "tsu-ee".

Habitat. Borders of deserts, including true desert, with annual rainfall less than 200 mm; prefers flat or undulating terrain, but sometimes occurs on slight slopes. Mostly on stony or compact soils, as in hammada areas; also wadi beds. Habitats occupied in N Africa range from open *Stipa* or *Lygeum* steppes to arid areas with widely variable vegetation types, including wormwood (*Artemisia*) shrubs or succulent *Aizoon*, and to very barren areas.

Food and Feeding. Seeds, invertebrates and green plant material. In Western Sahara takes ants, other insects, and some seeds; in W Algeria and NC Sahara mostly green material, insects and seeds, also a small lizard; in Jordan diet includes small fruits of *Euphorbia kahirensis*. Locusts (Orthoptera) reported as fed to chicks. Forages singly or in small flocks. Searches on ground, sometimes hopping; pulls branches down to ground to reach seeds; also digs. Not clear if it needs water, but flocks recorded at watering points.

Breeding. Lays Feb-May. Song-flighting male apparently rises to considerable height, and descends by parachuting in zigzag. Nest a shallow scrape lined with vegetation, on ground beneath or beside bush or stone, with rampart of pebbles on exposed side; occasionally built in open site. Clutch 3-5 eggs (mode 4); female recorded as incubating, chicks fed by both parents; no information on incubation and nestling periods, nor on fledging period of chick.

Movements. Resident; mostly nomadic in non-breeding season, normally in small parties, although flocks of up to 50 individuals recorded in Morocco. Rare and irregular visitor to Egypt; uncommon winter visitor to C & S Saudi Arabia, and small numbers seen occasionally in W Kuwait and nearby regions. Sporadic visitor to S Israel; vagrant in S Yemen.

Status and Conservation. Not globally threatened. Relatively small breeding range highly discontinuous and imperfectly known. Widespread and frequent to sparse in NW Africa, where rather scarce in sublittoral zone of Western Sahara, and rare, perhaps scarce, breeder in Tunisia; uncommon to abundant in S & SE Morocco, found in flocks of up to several dozen, with a winter record of "thousands" at Jerada Pass. Two old records from NE Libya (El Mechili, in Cyrenaica). In Saudi Arabia probably uncommon resident in N deserts, with small numbers breeding in Harrat Al Harrah Reserve; scarce in Jordan, breeding not confirmed until 1990. Has bred Egypt (1995) and Israel (1999), and old breeding record from "Syrian desert" (1930s).

Bibliography. Bergier & Bergier (1990), Borrow & Demey (2001), Brosset (1956, 1961), Bundy (1976), Bundy & Morgan (1969), Bundy & Warr (1980), Clancey (1993a), Clarke (1980), Cramp (1988), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dupuy (1969), Étchécopar (1975), Étchécopar & Hüe (1964), Fishpool & Evans (2001), Goodman & Watson (1983), Goodman *et al.* (1989), Granit (1999), van Heezik & Seddon (1999), Heim de Balsac (1936), Heim de Balsac & Mayaud (1962), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Isenmann & Moali (2000), Jennings (1981, 1995), Keith *et al.* (1992), Ledant *et al.* (1981), Mayaud (1985), Meinertzhagen (1951, 1954a), Shirihai (1996), Smith (1965), Snow & Perrins (1998), Svensson *et al.* (1999), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Valverde (1957), Wallace (1983).

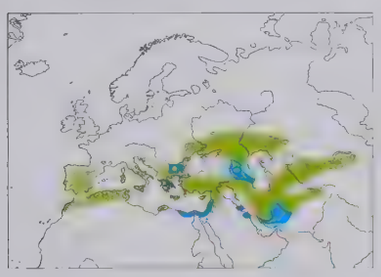
Genus *MELANOCORYPHA* Boie, 1828

63. Calandra Lark

Melanocorypha calandra

French: Alouette calandre **German**: Kalanderlerche **Spanish**: Calandria Común
Other common names: European Calandra Lark

Taxonomy. *Alauda calandra* Linnaeus, 1766, Pyrenees, Spain-France border.
Geographical variation rather slight, and small clinal increase in size from W to E. Described race *dathei* (from SE Turkey) considered synonymous with *gaza*. Four subspecies recognized.
Subspecies and Distribution.
M. c. calandra (Linnaeus, 1766) - Iberia and S France E to S Russia and NW Kazakhstan, S (including Mediterranean islands of Sardinia, Sicily, Crete, Cyprus) to NW Africa (N Morocco E to NW Libya), Turkey (except SC & SE), Transcaucasia and NW Iran.
M. c. hebraica Meinertzhagen, 1920 - SC Turkey and adjacent NW Syria S to Israel, Palestine and W Jordan.
M. c. gaza Meinertzhagen, 1919 - SE Turkey, E Syria, Iraq and SW Iran.
M. c. psammochroa Hartert, 1904 - N Iraq and N Iran (Zagros Mts E to Khorasan) E to Turkmenistan and E Kazakhstan.



Descriptive notes. 18-20 cm; male c. 54-73 g, female 44-66 g. Large, quite robust lark with deep-based heavy bill markedly downcurved on culmen, rather long broad-based wings with strongly reduced outer primary (falls 12-18 mm short of primary-covert tips), primary projection at least half length of tertials, shortish tail; hind claw long (11-16 mm) and straight. Nominate race has fairly obvious pale supercilium and area around eye; greyish-brown and well streaked above, large dark feather centres; secondaries and inner primaries white distally (broad white trailing edge in flight); outer rectrices white; underparts off-white, chest spotted and streaked black, characteristic large black patch on side of upper breast, tawny brown tinge to rear flanks; underwing blackish (striking in flight); iris dark brown; bill pale, dark culmen and tip; legs pinkish to orange-flesh. Sexes similar, female sometimes with breast-side patch less marked. Juvenile is paler, with white feather tips on upperparts and less apparent breast patches, outer primary longer (1 mm short of to 2 mm beyond tips of primary coverts). Race *psammochroa* is paler than nominate, tinged cinnamon in fresh plumage, dark centres on upperparts rather narrow, breast spots very small; *hebraica* is more or less intermediate, although chest spots rather large; *gaza* differs from previous in being paler grey above, with dark centres narrower. Voice. Song, usually in flight but sometimes from ground, an extended medley of rolling trills mixed with harsh chirping sounds (e.g. "schreee", "khitra"), with frequent mimicry of other bird species; similar to that of *Alauda arvensis*, but broken by short pauses and with more harsh chirps, overall less musical, but more varied and powerful. Flight calls typically dry, sharp trills.
Habitat. Open plains, from steppes and pastures to extensive dry cereal cultivations; true steppe, with dense grass cover, probably the original habitat, but in Mediterranean Basin mainly dry pastures and dry cultivations used. In cultivated areas prefers fallows, long-fallows and field edges; to lesser extent sown fields, selecting unirrigated legumes and barley fields. Avoids deserts and semi-deserts, as well as rocky areas. Mainly lowlands, but reported at up to 1400 m in Spain; locally to at least 2000 m in Turkey and C Asia.
Food and Feeding. Mainly insects during spring, and seeds and shoots in winter. Wide variety of invertebrates, dominated by grasshoppers (Acrididae) and caterpillars; seeds mostly of cereals and weeds. Energy consumption of free-living individuals estimated at 320 kJ per day. Needs to drink water. Forages on ground, singly or in small flocks; often in large flocks, sometimes mixed with Corn Buntings (*Miliaria calandra*), outside breeding season. Runs on ground, picks items from surface; digs with the bill. Occasionally hovers to inspect tops of small bushes.
Breeding. Laying from early Apr to Jul (groups of males arrive in breeding areas in Feb-Mar); two broods per season. Monogamous. Solitary and territorial, but semi-colonial where density high. Male song flight may reach great heights and last many minutes (up to c. 30 minutes recorded). Nest built by female, sometimes assisted by male, in shallow depression on ground, often under tussock, made from grass stems and small leaves, lined with softer material, internal diameter 8 cm. Clutch 3-6 eggs (mode 4-5), largest clutch size in middle of laying season; replacement laid if first clutch lost; incubation by female alone, from last or penultimate egg, period 11-13 days, occasionally longer; chicks brooded by female during first 1-3 days, then cared for and fed by both parents, nestling period 8-10 days, fledging period 19-22 days. Nestling mortality rate relatively low, 34%.
Movements. Mediterranean populations chiefly resident, but outside breeding season wandering in flocks. E populations migratory or partially migratory, wintering from S Russia S to N Africa (scarce visitor in Egypt), S Iraq and S Iran; passage in Russia mainly Oct and Mar. Vagrants recorded N to Britain, Netherlands, Germany, Poland, Norway, Sweden, Finland, also W to Madeira and S to E Arabia.
Status and Conservation. Not globally threatened. Common to very common in many parts of range; rare, and declining, in others. In Europe, populations concentrated mainly in Iberia and Russia; estimated 10,000-100,000 pairs in Portugal; very common and widespread in Spain (except in N humid belt, littoral regions and mountain areas), 1,030,000-3,400,000 pairs, with densities of up to 2-3 birds/ha in favoured areas; 5000-15,000 pairs in Italy, recorded densities 1-3 pairs/ha; 100-150 pairs in Croatia, 300-800 in Albania, 3000-5000 in Greece, 1000-5000 in Romania, 3000-5000 in Moldova; up to 10,000,000 pairs in Russia, densities 1-2 pairs/ha. Breeds on major Mediterranean islands, i.e. Sardinia, Sicily (fairly common), Crete and Cyprus (common, 10,000-25,000 pairs, post-breeding flocks of up to c. 1000). In N Africa, common in Morocco (especially N of Marrakech and in E), widespread in Tell and Hauts Plateaux of Algeria (flocks of up to several thousands in Oran region), and common in N Tunisia (locally in large numbers); in Libya scarce on Tripoli coast (breeding not proved) and common breeder in NE coastal plains (Barce cornlands). Estimated 100,000-1,000,000 pairs in Turkey (common on plains and fields of W & C, but scarce or absent at higher altitudes in E). Reported as very rare in Armenia, common in Azerbaijan, and scarce and local in Lebanon (Beqaa Valley); c. 4000-6000 pairs in Israel in 1980s. In former USSR said to be occasionally very common, and in some places abundant (up to 2 pairs/ha). Recent range contractions and declines in many countries, especially France, where perhaps over 400 pairs in 1980 but fewer than 50 in 1997 (was common in 19th century in all Mediterranean climate regions, also scarce breeder in Corsica, but strong decline since early 20th century and now absent from most areas); in Italy has disappeared from NE coastal belt and Tuscany region of Italy, and reductions noted also in Spain, Greece and Israel; declines recorded in Ukraine and also in Kazakhstan (between R Volga and R Ural), but said to have spread N during 1970s in intervening part of S Russia (Voronezh region). Negative trends usually associated with agricultural intensification and resultant land-use changes (loss of fallows, change from cereal crops to vineyards or olive groves, new irrigations, etc.), also with decline in extensive sheep-rearing, and with afforestation schemes. Species is reported as causing some damage in cereal cultivations in Iraq in winter.

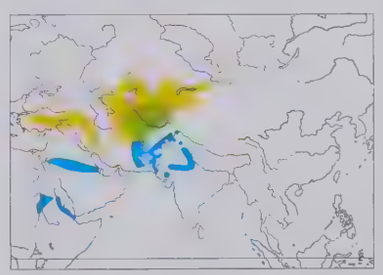
Bibliography. Adamian & Klem (1999), Ash (1962), Averin & Ganya (1970), Beaman *et al.* (1975), Belik (2000), Berezovikov & Kovshar (1994), Bergmann & Helb (1982), Bernis (1971), Brosset (1956, 1961), Bub & Herroelen (1981), Bundy (1976), Bundy & Warr (1980), Cheylan (1999), Cheylan *et al.* (1983), Christen & Jenny (1983), Cramp (1988), Dementiev *et al.* (1970), Deng Heli *et al.* (1991a), Díaz (1994a), Dubois *et al.* (2000), Estrada (2003), Étchécopar & Hüe (1964), Flint & Stewart (1992), Germain (1965), Glutz von Blotzheim & Bauer (1985), Goodman *et al.* (1989), Goriup (1988a), Guerrieri *et al.* (1997), Hagemeijer & Blair (1997), Halse & Trevenen (1986), Handrinos & Akriotis (1997), Heath *et al.* (2000), Heim de Balsac (1936), Heim de Balsac & Mayaud (1962), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Iapichino & Massa (1989), Isenmann & Moali (2000), Jennings (1981), de Juana *et al.* (1988), Keith *et al.* (1992), Korelov (1970), Kostin (1983), Le Berre & Rostan (1977), Ledant *et al.* (1981), Lindroos & Tenovuo (2000a), Magyar *et al.* (1998), Makatsch (1976), Martín & Lorenzo (2001), Mautsch (1981), Mayaud (1985), Meinertzhagen (1951, 1954a), Meschini & Frugis (1993), Mountfort (1954), Popenko (1979), Ramadan-Jaradi & Ramadan-Jaradi (1999), Roselaar (1995), Rufino (1989), Schönwetter (1979), Shirihai (1996), Shishkin (1980), Simms (1992), Snow & Perrins (1998), Sultana & Gauci (1982), Svensson *et al.* (1999), Szenek (1986), Tellería *et al.* (1999), Thévenot *et al.* (2003), Thibault (1983), Thomsen & Jacobsen (1979), Ullman (1990), Vaurie (1951a, 1959), Vinicombe & Cottridge (1996), Vittery *et al.* (1972), Wagstaff (1987), Wallace (1984), van der Wolf (1989), Yesilevskaya & Pivneva (1996), Zink (1973-1985).

64. Bimaculated Lark

Melanocorypha bimaculata

French: Alouette monticole **German**: Bergkalanderlerche **Spanish**: Calandria Bimaculada
Other common names: Eastern Calandra Lark

Taxonomy. *Alauda bimaculata* Ménétriés, 1832, mountains near Talysh (= Talyshskiye Goro), on Azerbaijan-Iran border.
Geographical variation slight; rufous-tinged birds from Asia Minor described as race *rufescens* and paler ones from E Iran and Afghanistan as *torquata*, but considered insufficiently distinct to merit subspecific separation. Monotypic.
Distribution. Breeds from WC Turkey E to Armenia, S Azerbaijan and W & S Iran and, E of Caspian Sea, to SE Kazakhstan, Kyrgyzstan, NE Iran and N Afghanistan; also isolated populations in Lebanon, N Israel, S Syria and N Iraq. Winters in NE Africa, S Middle East and N Arabia E to NW India.



Descriptive notes. 17-18 cm; 47-62 g. Large, fairly robust lark with deep-based heavy bill, rather long wings, short tail. Has prominent whitish supercilium, distinct dark loral stripe, rufous-tinged ear-coverts; above, buffy grey-brown or more rufescent grey-brown, heavily streaked blackish; wings and tail dark grey-brown, upperwing-coverts and tertials with pale buffish tips and edges, rectrices with broad white tips (except central pair); whitish or pale buffish below, breast side tinged more buffish, with fine dark streaks, prominent blackish patch on side of lower neck/upper breast (patches often meeting thinly in centre); underwing brown-grey; bill yellowish or pinkish, dark culmen and tip of lower mandible; legs pinkish to yellowish. Distinguished from *M. calandra* by more contrasting head pattern, shorter tail and, in flight, shorter and more triangular wings (characteristic silhouette, somewhat like that of a *Sturnus* starling), less contrastingly dark primaries above, no white trailing edge of wing, more prominent white tip of tail but no white outer rectrices, paler underwings. Sexes similar, female on average smaller. Juvenile has distinct whitish fringes and dark submarginal bands above (scaly impression), breast patches lacking or less obvious. Voice. Song, in flight, less often from ground or low perch, a protracted fast twittering, like that of *M. calandra* but simpler, more monotonous, harsher and more grating, and includes less mimicry. Most calls harsh, rolling and drawn out, can be very like those of *M. calandra* but frequently deeper and more throaty.
Habitat. Open habitats; generally stonier and less grassy terrain and, when breeding, in more mountainous or hilly country (to c. 2700 m) than areas preferred by *M. calandra*, but both species sometimes breed together in flat, dry grassy areas in plains.
Food and Feeding. Invertebrates and seeds. Invertebrates include adults and non-adults (eggs, larvae, pupae) of orthopterans, termites (Isoptera), bugs (Hemiptera), lepidopterans, flies (Diptera), hymenopterans, beetles (Coleoptera), arachnids; seeds include those of e.g. *Sorghum*, *Amaranthus*,

Leguminosae, *Hypericum*, *Galium*, *Heliotropium*, Gramineae. Adults in breeding season apparently feed mainly on invertebrates, and these also form main or sole diet of nestlings. Forages on ground, singly or in flocks.

Breeding. Season late Mar/early Apr to mid-Aug; sometimes two broods. Male song flight in irregular "circles" at low height, with rather slow, somewhat jerky wingbeats and closed tail, or hanging rather still, or drifting about high up and with usually rather quick, continuous wingbeats and spread tail. Nest, built by female alone, a loose cup of grass and rootlets, with thinner material internally than externally (outer walls may also contain pieces of paper, rags and dung), in depression on ground, usually sheltered by tussock or small bush. Clutch 3-6 eggs, generally 4 or 5; incubation by female only, period repeorted variously as 12-13 or 14-15 days; young leave nest at 9-12 days, but not capable of flying until c. 15-16 days, fed by both parents for up to 30 days.

Movements. Migratory; possible resident in parts of extreme S of range. Winters mainly in CE Sudan, N & NE Ethiopia and Eritrea, also through N Saudi Arabia and in S Iran, and S Turkmenistan, Uzbekistan and W Tadjikistan S through W & S Afghanistan and E Iran to S Pakistan and NW India; scarce or irregular winterer in Israel, Jordan, Arabian Gulf coasts, and Oman. Spring migration in Feb to late Apr; autumn migration in Sept-Nov, chiefly Oct to early Nov. Rare but regular on passage in most Middle East countries and in Cyprus. Vagrants recorded in several European countries, also in Namibia and Japan.

Status and Conservation. Not globally threatened. Locally common; scarce to rare in parts of range. Widespread and locally common to very common in Armenia; in Azerbaijan, uncommon to common generally but very common in N (Nakhichevan region). Bred in Kuwait in 1978. Estimated 5000-50,000 breeding pairs in Turkey; c. 40 pairs in Israel, at two sites. No obvious threats but, as with most Asian larks, land-use changes could potentially have an adverse impact.

Bibliography. Adamian (1963), Adamian & Klem (1999), Ali & Ripley (1987), Alström *et al.* (2004), Andersson & Larsson (1985), Baglieri & Iapichino (1979), Beaman & Madge (1998), van den Berg (1987), Bergmann & Helb (1982), Beshir (1978), Brazil (1991), Brooke (1988), Bub & Herroelen (1981), Castell (1996b), Cramp (1988), Dementiev *et al.* (1970), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Étchécopar & Hüe (1964, 1983b), Flumm (1977), Gavrilov (1999), Glutz von Blotzheim & Bauer (1985), Grimmett *et al.* (1998), Harris *et al.* (1996), Heath *et al.* (2000), van Heezik & Seddon (1999), Holtom *et al.* (1988), Hüe & Étchécopar (1970), Jennings (1995), Jones (1965), Jonsson (1992), Keith *et al.* (1992), Korelov (1970), Lewington *et al.* (1991), Lindroos & Tenovuo (2000a), Mackworth-Praed & Grant (1960), Mild (1990), Pätzold (1994, 2003), Porter *et al.* (1996), Ripley (1982), Roberts (1992), Roselaar (1995), Shirihai (1996), Simms (1992), Snow & Perrins (1998), Stepanyan (1990), Svensson (1992), Ullman (1990), Vaurie (1951a, 1959), Whitehouse (1978).

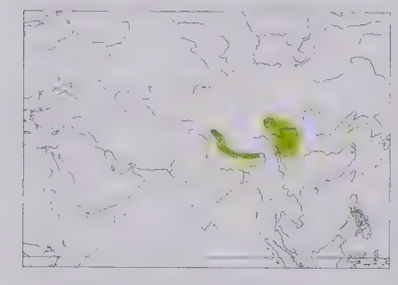
65. Tibetan Lark

Melanocorypha maxima

French: Alouette du Tibet **German**: Sumpflerche **Spanish**: Calandria Tibetana
Other common names: Asiatic/Long-billed (Calandra) Lark

Taxonomy. *Melanocorypha maxima* Blyth, 1867, borders of Sikkim.
Geographical variation relatively insignificant. Several races described, including *kashmirica* (E Kashmir), *flavescens* (W Nan Shan, Gansu), *holdereri* (Gansu, later interpreted as SW Tibetan Plateau NE to E Qinghai and Gansu) and *subgrisea* (NE Qinghai), but considered insufficiently distinct to merit recognition. Monotypic.

Distribution. Tibetan Plateau from NW India E to C China (NE Qinghai, Gansu, extreme W Inner Mongolia & NW Sichuan).



Descriptive notes. c. 21-22 cm; up to 75 g. Distinctive; the largest and most bulky Eurasian lark, with rather long, comparatively slender, slightly decurved bill, broad longish wings, fairly short tail. Has poorly marked head, heavily dark-streaked brownish upperparts, dark grey-brown upperwing-coverts and tertials with pale tips and edges; remiges and rectrices blackish-brown, secondaries and inner primaries with broad white tips (white trailing edge in flight), most rectrices with whitish tips (width increasing outwards), outermost pair extensively white; mainly whitish below, blackish patch on side of lower neck/upper breast, pale underwing-coverts; iris dark brown; bill pale pinkish basally, turning greyer and darker towards tip; legs dark grey with pinkish tinge. Sexes alike in plumage, female smaller than male. Juvenile has distinct pale buffish or whitish fringes and dark subterminal bands above, including wing-coverts and tertials, lacks dark breast-side patch but shows indistinct dark spots on side of breast. Voice. Song, from ground or in flight, rich and varied, rather slow-flowing, often includes mimicry of other birds and characteristic call-like grating notes, may be continuous for long periods or split into shorter strophes. Calls rather low-pitched and grating.

Habitat. Usually found in grassy, somewhat wet areas, such as marshlands by lakes and rivers. Generally between 4300 m and 4600 m in NW India; at or above 3200 m in NE part of range.

Food and Feeding. Diet poorly known: seeds, tender leaves, berries and invertebrates taken. Forages on ground.

Breeding. Little studied. Season Apr-Jul/early Aug; two broods. Male song flight at low or high altitude, with rather slow wingbeats, often gliding on V-held wings low over ground before landing. Nest built by female, a cup of grass on ground. Clutch 2 or 3 eggs, rarely 4; incubation and fledging periods not known; young fed by both parents.

Movements. Sedentary or dispersive.

Status and Conservation. Not globally threatened. Locally common. A relatively poorly known species; no population estimates.

Bibliography. Ali & Ripley (1987), Alström *et al.* (2004), Cheng Tsohsin (1987), Deng Heli & Zhang Xiaoai (1988), Deng Heli *et al.* (1991b), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Étchécopar & Hüe (1983b), Grimmett *et al.* (1998), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Nadler (1991), Pätzold (1994, 2003), Rasmussen & Anderton (2004), Ripley (1982), Vaurie (1951a, 1959, 1972), Wang Xiangting (1991), Zhao Zhengjie (2001), Zheng Baolai (1985).

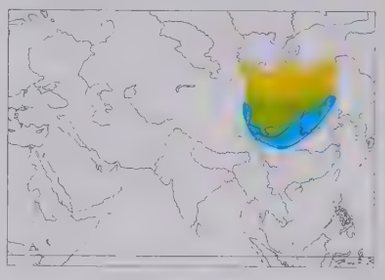
66. Mongolian Lark

Melanocorypha mongolica

French: Alouette de Mongolie **German**: Mongolenlerche **Spanish**: Calandria de Mongolia
Other common names: Mongolian Sand Lark, Mongolian Skylark

Taxonomy. *Alauda mongolica* Pallas, 1776, northern Mongolia.
Monotypic.

Distribution. Breeds Mongolia and neighbouring parts of S Russia and NE China.



Descriptive notes. c. 19 cm. Rather large, quite large-billed, fairly long-winged lark with distinctive pattern. Has long whitish supercilia joining across nape, latter bordered below by rufous band, unstreaked rufous crown with pale centre, grey-brown upperparts streaked blackish; lesser and median wing-coverts rufous, greater coverts and tertials dark grey-brown with pale tips and edges; remiges blackish, distal ends of secondaries and inner primaries white (very broad white trailing edge in flight), blackish or dark grey-brown primary coverts; tail blackish, central feather pair browner, outermost pair white; white below, large black patch on side of lower neck/upper breast, white underwing-coverts; iris dark brown; bill pale pinkish or yellowish, tip grey, culmen often grey; legs pale pinkish. Distinguished from *M. leucoptera* mainly by different head pattern, black patch on neck/breast side, dark grey-brown primary coverts, even more white on rear wing. Sexes similar in plumage, female on average smaller. Juvenile lacks rufous colours and prominent black neck patch (but has dark spots on breast, mainly on sides), has distinct pale buffish or whitish fringes and dark submarginal bands above. Voice. Song, from ground or low perch or in flight, a sustained twittering with interspersed dry notes, reminiscent of that of congeners, especially *M. bimaculata*. Various harsh, rolling and high-pitched calls.

Habitat. Favours rather dry grassland, preferentially with patches of denser, taller grass, but also in damper areas with lush grass. Sometimes also in more rocky uplands.

Food and Feeding. Little information. Diet seeds and invertebrates.

Breeding. Little studied. Season mainly Apr-Aug; two broods. Male song flight with rather slow wingbeats, sometimes quivering on bowed wings. Nest not fully documented, said to be similar to that of congeners. Clutch 3-5 eggs; incubation period 15 days; no information on nestling period.

Movements. Sedentary or short-distance migrant; N parts of breeding range mainly or completely vacated in winter. Spring migration Mar to early May, mainly in second half of Apr; autumn migration late Aug to Oct or early Nov. In severe winters, may reach well S of breeding range.

Status and Conservation. Not globally threatened. Uncommon to locally common. Rather poorly known species; no population estimates.

Bibliography. Alström *et al.* (2004), Belik (1990), Cheng Tsohsin (1987), Dementiev *et al.* (1970), Étchécopar & Hüe (1983b), Hsu Weishu (1988), Liu (1998), MacKinnon & Phillipps (2000), Madge (1988), Mauersberger (1982), Pätzold (1994, 2003), Rozendaal & Kortekaas (1980), Stepanyan (1990), Vaurie (1959, 1972), Wang Xiangting (1991), Zhao Zhengjie (2001), Zheng Baolai (1985), Zheng Guangmei & Zhang Cizu (2002).

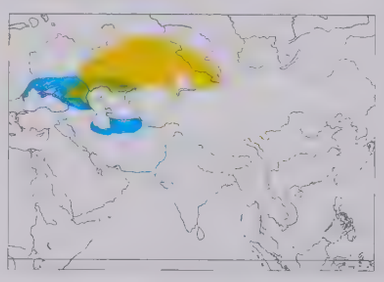
67. White-winged Lark

Melanocorypha leucoptera

French: Alouette leucoptère **German**: Weißflügellerche **Spanish**: Calandria Aliblanca

Taxonomy. *Alauda leucoptera* Pallas, 1811, Baraba Steppes, south-central Russia.
Monotypic.

Distribution. Breeds SW Russia (S to NW Caspian Sea) E to L Balkhash. Winters S to Black Sea region and N Iran.



Descriptive notes. c. 18 cm; male 40-52 g, female 36-48 g. Rather well-proportioned lark with moderately large bill, long wings, distinctive wing pattern. Male has rufous forehead, crown and rear ear-coverts with little or no dark streaking, whitish supercilium and anterior ear-coverts; in fresh plumage (autumn) head less rufous and more streaked; upperparts grey-brown with moderately prominent dark streaks, lesser wing-coverts and primary coverts rufous, median and greater coverts and tertials dark grey-brown (often some rufous on at least median coverts) with paler tips and edges; remiges blackish, secondaries and inner primaries with extensive white distally (very broad white trailing edge in flight); tail blackish, central feather pair browner, outermost pair white; whitish below, breast side rufous-tinged and very finely streaked dark (less rufous and more streaked in fresh plumage); white underwing-coverts; iris dark; bill pale grey to pinkish, culmen and tip of lower mandible dark grey; legs dark grey or pale pinkish. Distinguished from *M. mongolica* mainly by different head pattern, no black patch on neck/breast side. Female has little or no rufous on head and breast, breast finely streaked. Juvenile lacks rufous, has distinct whitish fringes and dark subterminal bands above. Voice. Song, from ground or low perch or in flight, a protracted mix of twittering and trills with interspersed harsher notes and mimicry, reminiscent of that of e.g. *M. calandra* but higher-pitched and less coarse. Calls with various short, harsh or high-pitched, often multisyllabic, notes.

Habitat. Breeds mainly on flat or slightly undulating, dry grass steppe (e.g. *Stipa* and *Festuca*) or wormwood (*Artemisia*) steppe, less often in cultivated fields. In non-breeding season found in wider range of grassy habitats, including stubble fields.

Food and Feeding. Invertebrates and seeds. In summer, apparently mainly insects; in one study, beetles (Coleoptera) formed up to 50% of diet, orthopterans 32% and lepidopterans (including caterpillars) 16%, with Hymenoptera, bugs (Hemiptera) and spiders (Araneae) infrequent. Seeds of e.g. Chenopodiaceae eaten in summer, while in non-breeding season those of *Setaria viridis* and *Carex stenophylla* as well as cereal shoots have been noted in diet; seeds apparently main food in winter. Forages on ground, in pairs or in small groups, but outside breeding season sometimes in large flocks.

Breeding. Season late Apr/early May to early Aug; number of broods uncertain, conflicting reports of one or two (two more likely in view of drawn-out season). Male low song flight with stiff, slightly downward-bent, angled, quivering wingbeats, may glide on V-held wings when low over ground; high song flight with somewhat quivering beats, now and then interspersed by short glides on outstretched wings. Nest built by female alone, in depression on ground, generally behind tussock or other plant, made from dry grass and *Artemisia*, lined with finer grass. Clutch 3-6 eggs, generally 4 or 5, exceptionally up to 8 recorded; incubation by female, probably assisted by male, period 12-15 days; chicks fed by both parents, leave nest at c. 10 days, fledging period not known.

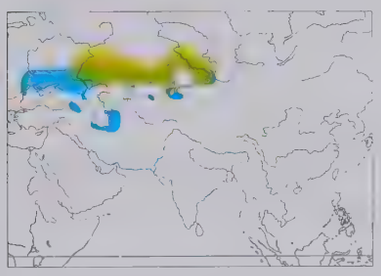
Movements. Largely migratory. Winters mainly in SW part of breeding range, and from N of Black Sea S through Transcaspia to N Iran. Autumn migration in late Aug to early Nov, mainly Sept-Oct; arrival back on breeding grounds from mid-Mar to late Mar or early Apr, but not until early May in extreme N of range. Vagrants recorded W to Turkey and several European countries (W to Norway and Britain).
Status and Conservation. Not globally threatened. Uncommon to locally common. No reliable population estimates; generally less numerous than other larks occurring in same region. Apparent decrease in numbers and contraction of range recorded in some areas as a result of cultivation of steppe. Was a regular winter visitor to Turkey in 19th century.
Bibliography. Alström *et al.* (2004), Bub & Herroelen (1981), Cramp (1988), Dementiev *et al.* (1970), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Étchécopar & Hüe (1983b), Filipek (1995), Gavrilov (1999), Glutz von Blotzheim & Bauer (1985), Hagemeijer & Blair (1997), Heath & Evans (2000), Heath *et al.* (2000), Hüe & Étchécopar (1970), Koshelev (1980), Lewington *et al.* (1991), Lindroos & Tenovuo (2000b), Lines & Moyes (1996), MacKinnon & Phillipps (2000), Madge (1988), Marr & Porter (1995), Meinertzhagen (1951), Pätzold (1994, 2003), Robertson (1986), Roselaar (1995), Ryabov & Mosalova (1967), Simms (1992), Snow & Perrins (1998), Stepanyan (1990), Vaurie (1959).

68. Black Lark

Melanocorypha yeltoniensis

French: Alouette nègre **German**: Mohrenlerche **Spanish**: Calandria Negra

Taxonomy. *Alauda yeltoniensis* J. R. Forster, 1767, Lake El'ton, south-west Russia.
Monotypic.
Distribution. Breeds in SW Russia and N Kazakhstan from just W of R Volga E to L Zaysan, and S to N shores of Caspian Sea, Aral Sea and just N of L Balkhash. Winters S to Black Sea region, Caucasus, N Iran, Uzbekistan, Turkmenistan and S Kazakhstan.



Descriptive notes. Male c. 20 cm, 56-76 g; female c. 19 cm, 51-68 g. Heavy-bodied lark with rather large bill, quite short tail and fairly broad wings. Adult male is unmistakable: in fresh plumage (autumn) black, with broad buffish feather tips, especially above; pale tips abraded by spring, plumage practically all black in summer; iris dark; bill pale grey, with or without dark culmen or tip of upper mandible, in winter probably more yellowish-tinged; legs dark grey. Adult female in fresh plumage (autumn) is rather pale buffy brownish-grey above with indistinct dark markings, whitish below with buffish breast indistinctly dark-spotted, has diagnostic tertial pattern of rather broad whitish fringe, blackish subterminal band, and broad buffish submarginal area with blackish anterior border; in worn plumage, heavily streaked above and below (including belly), looking very dark overall; throughout year, head pattern rather indistinct, and no prominent pale patterns in wings and tail in flight. Juvenile is similar to moderately worn adult female, but has distinct pale buffish or whitish feather fringes and dark subterminal bands above. Voice. Song, from ground or, preferably, low perch such as bush, or in flight, a sustained rapid twittering and chirping with interspersed softer, more plaintive notes, like that of e.g. *M. calandra* but strophes shorter and vary more in tempo, strength, pitch, type of notes etc. Calls with various short, harsh notes, reminiscent of e.g. *M. calandra*.
Habitat. Steppe (with e.g. *Artemisia*, *Stipa*, *Festuca*), preferably with some bushes, often in wet patches. Also on patches of such habitat in saline semi-desert.
Food and Feeding. Invertebrates and seeds. Diet in summer reported as mainly invertebrates, especially orthopterans and adult and larval beetles (Coleoptera), but also e.g. bugs (Hemiptera), lepidopterans, flies (Diptera), hymenopterans (chiefly ants), spiders (Araneae) and myriapods, also some seeds and other plant material (e.g. *Festuca*, *Stipa*, Chenopodiaceae, Polygonaceae); according to other reports, more seeds (especially of *Polygonum* and *Rumex*) than invertebrates taken in summer. In winter, feeds exclusively on seeds. Forages on ground, in flocks outside breeding season. In winter, when ground snow-covered, seeks seeds by digging down to c. 8 cm, also by creating channels and tunnels up to 20 cm long in snow; also said to follow horses and to take food items exposed by them.
Breeding. Season late Mar to Aug, starting at least one month earlier in S than in N; number of broods uncertain, but length of season suggests that two more likely. Male aerial display spectacular, in high song-flight flies as if slowly "rowing", with fully extended and raised wings and fanned tail, or alternates between normal wingbeats and short or longer glides on spread wings and tail; in low-level display, ordinary flight interchanging with spells of slow, large-amplitude beats (may then clap wings) and short glides on raised, often trembling, or depressed wings. Nest built by female, in depression on ground, usually under tuft of grass or other plant, made from *Artemisia* or grass, lined with finer grass, site often surrounded by animal dung. Clutch 2-8 eggs, most often 4 or 5; incubation by female alone, period 15-16 days; chicks fed by both parents, leave nest at 9-11 days, fledging period not documented.
Movements. Resident or short-distance migrant; probably also to some extent nomadic. Some move S or SW, beginning in Sept and Oct, reaching Ukraine, Black Sea region and extreme S parts of European Russia, and S to Caucasus region, N Iran, Turkmenistan and Uzbekistan; a few also move N, NE and NW. Adults usually form single-sex flocks in non-breeding season. Recorded as accidental in several European countries (W to Britain, N to Sweden and Finland), also Turkey, Lebanon and Mongolia.
Status and Conservation. Not globally threatened. Locally common. No accurate figures for population; possibly 6000-10,000 pairs estimated in Russia. Has apparently decreased locally in Kazakhstan, possibly also in Russia, as a result of cultivation of dry steppes; steppe habitat elsewhere in range also threatened by intensification of stock-farming. Sex ratio of this species exceptionally skewed, males outnumbering females (e.g. 68% of fledged juveniles in one study were males); in non-breeding season, male flocks often large but those of females much smaller; flocks consisting solely of males often encountered also at peak of breeding season.
Bibliography. Alström *et al.* (2004), Anon. (2004), Bazhanov (1928), Bub & Herroelen (1981), Cramp (1988), Croft (2003), Dementiev *et al.* (1970), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Filip (1996), Galushin *et al.* (1994), Gavrilov (1999), Glutz von Blotzheim & Bauer (1985), Heath & Evans (2000), Heath *et al.* (2000), Hordowski (1989), Hüe & Étchécopar (1970), Jiang *et al.* (1991), Korelov (1970), Krivitsky (1962), Larsson (1993, 1994), Lewington *et al.* (1991), Lindroos & Tenovuo (2002), Moiseev (1980), Pätzold (1994, 2003), Piechocki *et al.* (1982), Rowlands (2004), Ryabov (1967), Snow & Perrins (1998), Stepanyan (1990), Vaurie (1959).

PLATE 59

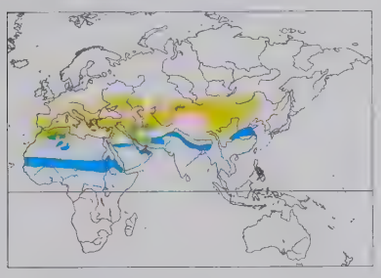

inches 3
cm 8
ssp brachydactyla
ssp cinerea
ssp saturatior
70
ssp spleniata
69
ssp millardi
ssp woltersi
ssp blanfordi
71
ssp daaroodensis
72
73
ssp somalica
74
ssp rufescens
ssp cheleensis
ssp athensis
75
ssp heinei
ssp apetzii
ssp adamsi
ssp raytal
ssp niethammeri
ssp seebohmi
76
ssp krishnakumarsinhji

Genus *CALANDRELLA* Kaup, 1829

69. Greater Short-toed Lark
Calandrella brachydactyla

French: Alouette calandrelle **German**: Kurzzehenlerche **Spanish**: Terrera Común
Other common names: (European) Short-toed Lark

Taxonomy. *Alauda brachydactila* [sic] Leisler, 1814, Montpellier, France.
May form a superspecies with *C. cinerea*, with which often merged, and with *C. blanfordi*, *C. erlangeri* and *C. acutirostris*. Geographical variation slight and clinal, generally becoming paler and greyer to E, more rufous and streaked above to W, but greatly complicated by strong influence of wear on plumage, considerable individual variation and lack of natural boundaries; described ranges of listed taxa somewhat arbitrary. Further, races *artemisiana*, *hermonensis* and *woltersi* all intergrade in S Turkey; birds from Ukraine are intermediate between nominate race and *longipennis*, and those from Ural-Volga steppes, the Caucasus, E Iran and N Afghanistan between latter race and *artemisiana*. In addition, populations from E Altai and S Siberia have been separated as race *orientalis* and those from NW Manchuria as *puii*, but differences from typical *longipennis* seem to be minor. Validity of race *hungarica* sometimes disputed, mainly on grounds that tiny population is apparently boosted by periodic influxes from elsewhere. Eight subspecies currently recognized.
Subspecies and Distribution.
C. b. brachydactyla (Leisler, 1814) - breeds Europe from W, NC & S France and Iberia E (including many Mediterranean islands) to Italy, the Balkans and Romania (possibly to Ukraine and S Russia), apparently also in some parts of Mediterranean coast of NW Africa; winters Africa.
C. b. hungarica Horváth, 1956 - breeds Hungary and N Serbia (Vojvodina), possibly also S Slovakia.
C. b. rubiginosa Fromholz, 1913 - breeds NW Africa from Morocco and N Western Sahara E to NW Libya (W Tripolitania); also Malta.
C. b. hermonensis Tristram, 1865 - S Turkey and Syria S to NE Egypt (Sinai Peninsula).
C. b. woltersi Kumerloeve, 1969 - S Turkey (Amik Gölü, Gaziantep, Birecik) and adjacent extreme NW Syria.
C. b. artemisiana Banjkowski, 1913 - breeds Asia Minor, the Caucasus, Transcaucasia and Iran; winters mainly SW Asia.
C. b. longipennis (Eversmann, 1848) - breeds Ukraine and S Russia E to N Mongolia and NW Manchuria; winters mainly S Asia.
C. b. dukhunensis (Sykes, 1832) - breeds Tibet and C China; winters S Asia.



Descriptive notes. 14-15 cm; c. 20-26 g. Small, neat, pale, short-billed lark with long tertials almost cloaking tips of folded wings, narrow and pointed outer primary strongly reduced (7-11 mm short of primary-covert tips), shortish tail; straight hind claw 7-9 mm long. Nominate race has broad whitish supercilium, grey-brown cheeks; warm brown to grey-brown and heavily streaked blackish above, top of head usually densely streaked and often rufous-tinged, with erectile feathers; median coverts with dark centres and buff fringes, contrast with rest of upperwing; tail blackish-brown, centre brown, white outer feathers; throat and underparts whitish, small blackish patch on lower neck side (often obscured in fresh autumn plumage), breast side with faint buff tinge and fine dark streaks (variable, often whitish and unstreaked); undertail blackish (noticeable in flight); bill pale horn-coloured, darker culmen and tip, yellowish on lower mandible; legs pale brownish-flesh to light brown. Sexes similar. Juvenile resembles adult, but upperpart feathers dark brown with buff fringes and whitish tips, outer primary longer (1-6 mm short of primary coverts) and tip more rounded. Races differ mainly in plumage tone above, but greatly affected by influence of wear, and following is only a general guide: *hungarica* is buffer and greyer than nominate; *rubiginosa* is more rufous, especially on crown, also more finely streaked; *hermonensis* is less rufous, more buff, than previous, with crown less contrasting; *woltersi* resembles last, but paler and greyer; *artemisiana* is slightly darker than last, more buffish-grey, also more heavily streaked; *longipennis* is greyish-sandy and finely streaked above, bill relatively small; *dukhunensis* is distinctive, larger, longer-winged and slightly smaller-billed than other races, dark brown and heavily streaked above, buff-washed below, legs dark. Voice. Song, in aerial display, less often from ground, clear and musical but rather monotonous, with accelerating simple notes, then several hesitant notes, and finally a long series of persistently repeated phrases each c. 2 seconds long and consisting of 8-10 bubbling notes, pauses of 2-3 seconds between phrases (coinciding with undulations in flight); imitations of other bird species often incorporated. Commonest call a dry "chirrup" or "dreet", often repeated; also "teeoo" or "trilp".
Habitat. Dry areas with sparse and low vegetation cover, on level or undulating terrain, with sandy or stony soils. Breeds mostly in fallow lands in Mediterranean Basin, but also dry pastures, tobacco fields, dirt tracks and olive groves; in Russia also more densely covered pastures, but absent in true steppe; sometimes in semi-arid areas, but avoids true desert. Mainly lowlands; to 1500 m in Tunisia. Occurs in semi-arid areas and farmland in non-breeding areas.
Food and Feeding. Mainly invertebrates during spring, also seeds and green parts of plants in other seasons. Invertebrate food very diverse, variable among areas, chiefly beetles (Coleoptera), ants, bugs (Hemiptera) and snails; seeds mostly of weedy forbs (*Polygonum*, *Amaranthus*), also cereal grain. Nestlings fed solely with invertebrates; fledglings take more green material than do adults. Forages on ground, singly or in small or large flocks. Searches slowly, picks items from ground surface.
Breeding. Lays in May-Jul in SW Europe and from mid-Apr in SE Europe; from early Apr in N Africa and Israel; two broods per season. Male song flight typically at heights of c. 30-50 m, undulating and bouncing in a circling but rather meandering path, lasting on average 3-5 minutes. Nest built by female, of grasses, rootlets and similar vegetation, lined with softer material, internal diameter 6 cm, placed in shallow scrape on ground, usually beside shrub or grass tuft, often with small rampart of sticks or stones; orientation in Spain mainly to N. Clutch 2-5 eggs, rarely 6 (mode 3 in N Africa, 4 in Spain, 5 in Hungary), clutch size in Spain larger in middle of season; replacement laid if first clutch lost; incubation by female alone, beginning with last or penultimate egg, period 11-13 days; chicks fed and cared for by both sexes, nestling period 9-12 days, mostly 8-10 days, fledging 12-15 days; dependence period of fledglings 1-3 weeks, shorter for first broods. Nest losses often very high, up to c. 80%; snakes a major predator, and some nests also destroyed by trampling by livestock. First breeding at 1 year.
Movements. Mostly migratory; only partially migratory in S of Palearctic range, and sedentary in Transcaucasia. Those from W & C parts of range winter mainly in sub-Saharan Africa (S Sahel zone) and Red Sea Basin, also in SW Asia; E populations migrate mostly to S & SE parts of Asia; highly gregarious on wintering grounds, occurring in flocks of hundreds or thousands. Autumn departure from mid-Aug through to Sept/Oct, passage on broad front; return begins late Jan, but migration later in E, and arrival on breeding grounds in N of range not until Apr-May; generally common on passage in N Africa, abundant in Egypt, and common to fairly common in Middle East and Arabian Peninsula; in S Israel, up to 14,000 per day recorded in autumn (Sept-Oct) and flock of c. 4000 in Apr. Vagrants regularly W to Scandinavia and British Is, and recorded on Madeira and Canary Is, also N to Iceland and regularly Finland; rare but annual in Japan; in S, recorded to Cameroon, DRCongo and Kenya.
Status and Conservation. Not globally threatened. Common to locally abundant in many parts of very extensive range. Estimated European population 2,500,000-3,500,000 pairs, vast majority concentrated in Iberia; widespread and numerous in Spain (in early 1990s 2,200,000-2,600,000 pairs, most in Ebro Valley, S Meseta and Andalucia, but absent in N humid belt), with up to 2-5 pairs/ha in best habitats, and common in Portugal (100,000-1,000,000 pairs, mainly in S); much smaller populations in France (1000-5000 pairs), Italy (15,000-30,000), Croatia (1000-1500), Albania (1000-3000), Greece (20,000-50,000), Bulgaria (5000-10,000), Romania (6000-8000), Hungary (8-10), Ukraine (7000-11,000 pairs); on Mediterranean islands, widespread but not abundant in Balearics, scarce Corsica (tens of pairs), common to fairly common Sardinia, Sicily and Crete, very common to common Malta (2000-3000 birds) and Cyprus (perhaps 5000-20,000 pairs); has bred Switzerland (1989) and E Austria (1966), and regularly S Slovakia since 1992. Estimated Russian population 100,000-1,000,000 pairs, with 2-3 pairs/ha on Russian steppes. In C parts of range, 10,000-100,000 pairs in Turkey (widespread and locally common in W, scarce in E), common in Azerbaijan, scarce in Lebanon, fairly common in Israel (a few thousand pairs), local in Jordan (where relatively dense colonization at Azraq in early 1980s, but no recent evidence of breeding); fairly common in China. In N Africa, common in Morocco, widespread in N Algeria, very common and widely distributed in Tunisia, rather scarce in Libya; scarce in NE Egypt, bred in Wadi El Arish area in 1989 and 1990 (breeding formerly suspected only for Wadi El Natrun, in early 19th century). In African non-breeding quarters widespread in Sahel belt, where locally abundant in Mali, widespread in Niger, and common in extreme NE Nigeria, Sudan (abundant on short-grass plains) and NE Ethiopia; common winter visitor in at least Saudi Arabia, Pakistan and parts of India. Declining, and considered "vulnerable", in Europe, where strong decline and range contraction in France (especially in W); over 20% decrease in numbers in 1970-1990 and perhaps over 30% in 1990-2000 in Spain; main threats from agricultural intensification (leading to loss of fallows, increased number of irrigation schemes, increase in surface area covered by crops, etc.) and afforestation of wastelands. Race *hungarica* threatened with extinction; only 8-10 pairs in Hungary, where numbers in traditional area, the Hortobágy steppe, have declined sharply since early 1980s, although sudden increases in certain years (attributed to influxes from neighbouring populations, hence casting doubts on validity of this race). Reported as causing damage to cultivations of pearl millet (*Pannisetum typhoides*) on wintering grounds in NW India (Rajasthan).
Bibliography. Adamian & Klem (1999), Ali (1996), Ali & Ripley (1987), Alström *et al.* (1992), Barlow *et al.* (1997), Bergmann & Helb (1982), Bindi *et al.* (1990), Brazil (1991), Brinkman (1987), Brooks, D.J. *et al.* (1987), Bundy (1976), Bundy & Warr (1980), Cave & Macdonald (1955), Cheng Tsohsin (1987), Cheylan *et al.* (1983), Christen (1983), Clarke (1980), Colston & Sirihai (1986), Cornwallis & Porter (1982), Cramp (1988), Curchod *et al.* (1990), Dathe (1952), Dementiev *et al.* (1970), Dennis & Wallace (1975), Díaz (1994b), Dickinson & Dekker (2001a), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dubois *et al.* (2000), Elgood *et al.* (1994), Endes (1970), Endes *et al.* (1967), Étchécopar & Hüe (1964), Flint & Stewart (1992), Fraticelli & Sorace (1988), Glutz von Blotzheim & Bauer (1985), Godlinsky (1996b), Goodman *et al.* (1989), Goriup (1988a), Grimmett *et al.* (1998), Guichard (1960), Hagemeijer & Blair (1997), Handrinos & Akriotis (1997), Heath *et al.* (2000), van Heezik & Seddon (1999), Heim de Balsac (1936), Heim de Balsac & Mayaud (1962), Hollom *et al.* (1988), Horváth (1956), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Isenmann & Moali (2000), Jennings (1981), de Juana & Suárez (2003), de Juana *et al.* (1988), Karnas (1986), Keith *et al.* (1992), Kumerloeve (1967, 1969), Lang (1987), Lardelli (1986), Ledant *et al.* (1981), Mackworth-Praed & Grant (1960, 1970), Magyar *et al.* (1998), Makatsch (1976), Marchant (1963), Mayaud (1985), Meinertzhagen (1951, 1954a), Meschini & Frugis (1993), Meyer de Schauensee (1984), Mihaly (1980), Moore & Boswell (1956), Muselet (1979, 1981, 1983), Nadler (1974), Niethammer (1963b), Olioso & Cheylan (1999), Olioso *et al.* (1983), Pesente (1991), Popenko (1979), Ramadan-Jaradi & Ramadan-Jaradi (1999), Richardson (1990), Ripley (1982), Roberts (1992), Roselaar (1995), Rufino (1989), Salvan (1968), Schönwetter (1979), Shirihai (1996), Simms (1992), Smith (1965), Smythies (1986), Snow & Perrins (1998), Suárez *et al.* (2002), Sultana (1991), Sultana & Gauci (1982), Svensson *et al.* (1999), Symens & Suhaibani (1993), Tellería (1981), Tellería *et al.* (1999), Tellini (1987), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Vaurie (1951a, 1959), Vinicombe & Cottridge (1996), Vittery *et al.* (1972), Walker (1981b), Wallace (1983, 1984), Whistler (1941), White (1961a), Zimmerman *et al.* (1996), Zink (1973-1985).

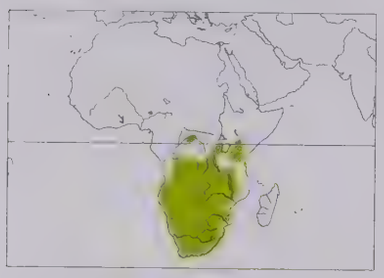
70. Red-capped Lark
Calandrella cinerea

French: Alouette cendrille **German**: Rotkappenlerche **Spanish**: Terrera Capirotada
Other common names: African Short-toed/Rufous Short-toed Lark

Taxonomy. *Alauda cinerea* J. F. Gmelin, 1789, no locality = Cape Town, South Africa.
May form a superspecies with *C. brachydactyla*, *C. blanfordi*, *C. erlangeri* and *C. acutirostris*; often considered conspecific with first three (especially *C. blanfordi* and *C. erlangeri*). Geographical variation among many contiguous races limited and broadly clinal; further study may demonstrate that several taxa are not sustainable. Additional named races are *ongumaensis* (N Namibia), synonymized with *spleniata*, *witputzi* (S Namibia), included in nominate, and *vagilans* (E Botswana and NE South Africa), included in *niveni*; also, description of *anderssoni* (C Namibia) apparently based on worn non-breeding specimen of nominate. Eight subspecies tentatively recognized.
Subspecies and Distribution.
C. c. saturatior Reichenow, 1904 - Nigeria (Jos Plateau), and DRCongo E to Uganda and W & SW Tanzania, S to Angola (except NW & S), N Zambia and Malawi.
C. c. williamsi Clancey, 1952 - S Kenya and N Tanzania.

On following pages: 71. Blanford's Lark (*Calandrella blanfordi*); 72. Erlanger's Lark (*Calandrella erlangeri*); 73. Hume's Lark (*Calandrella acutirostris*); 74. Somali Short-toed Lark (*Calandrella somalica*); 75. Lesser Short-toed Lark (*Calandrella rufescens*); 76. Sand Lark (*Calandrella raytal*).

C. c. spleniata (Strickland, 1853) - SW Angola and NW Namibia.
C. c. fulvida Clancey, 1978 - S Angola, S Zambia and Zimbabwe.
C. c. alluvia Clancey, 1971 - breeds coastal S Mozambique; disperses inland to N Botswana.
C. c. millardi Paterson, 1958 - S Botswana.
C. c. cinerea (J. F. Gmelin, 1789) - S Namibia and W South Africa.
C. c. niveni (Macdonald, 1952) - E South Africa.

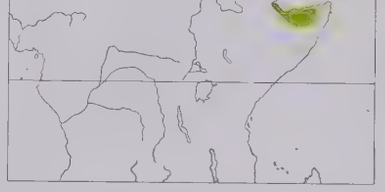


Descriptive notes. 14-15 cm; 20-26 g. Medium-sized lark with short, rather weak bill, adult with distinctive brick-red crown and breast-side patch, crown feathers sometimes raised to form prominent short crest; wing shape rather distinctive, with elongate outer primaries and inner secondaries and tertials. Nominate race has white supercilium contrasting with crown, plain brown or buffy face, slightly darker on ear-coverts; upperparts brown with slightly darker feather centres, rump rufous; flight-feathers and tail dark brown with paler buff-brown margins, outer primary and outer tail feathers with buffish-white outer webs, central tail with broad buffy margins (in flight, dark tail and flight-feathers contrast with paler wing-coverts and back); throat, partial collar beneath ear-coverts and underparts whitish, red patch on breast side, flanks variably washed buffy; eyes brown; bill blackish, with paler base; legs flesh-brown to dark brown. Easily distinguished from other larks by entirely red pectoral patches. Sexes alike. Juvenile is darker than adult, back and crown feathers with broad whitish margins and blackish-brown subterminal bars (appearing spotted or scaled above), breast diffusely spotted dark brown, pectoral patches mottled blackish, bill paler. Races differ mostly in upperpart coloration, varying from rather pale sandy-brown or grey-brown to warmer rufous-brown (paler and plainer in more arid areas): e.g. *spleniata* is much paler, pale yellow-sandy, and only lightly streaked; *millardi* is more whitish-grey above; *fulvida* is generally darker; *saturatior* is distinctly brighter, more rufous; *williamsi* is greyer overall, crown and breast patches duller rufous, upperparts darker and more heavily streaked than nominate. Voice. Male song, in flight, a series of simple, rather unmelodic whistles and short trills, may include mimicry of other birds' songs; also subsong with mimicry while foraging on ground, one bird recorded as mimicking in 5-minute period elements from 11 other species, including canaries (*Serinus*) and other finches, sparrows (*Passer*), barbets (Capitonidae), shrikes (Laniidae), weavers (Ploceidae) and starlings (Sturnidae). Loud, sparrow-like "chwerp" often uttered in flight or when flushed.
Habitat. Open grassland and bare ground, including recently harvested or ploughed fields, and edges of wetlands; common in short saltmarsh vegetation at coastal lagoons. Often nests in areas of poorly drained, clayey soils, frequently around wetland margins. In montane grasslands of E South Africa occurs at significantly higher densities on annually burned fields, and slightly more abundant in heavily grazed grasslands; often moves into burned areas immediately after a fire. Mainly short grassland in E Africa, to 3000 m. Frequently encountered on roads and road margins, especially after rain. Apparently flies to bare areas after sunset to roost.
Food and Feeding. Seeds, insects and snails. Stomach contents mostly seeds of grasses and sedges; relatively few insects, e.g. caterpillars, bugs (Hemiptera), grasshoppers (Acrididae), beetles (Coleoptera) and wasps (Hymenoptera), and only *Margarodes* scale insects (which feed on roots but emerge after rains) were frequent. In contrast, only 2% of seeds consumed in the Karoo were of grasses. Takes winged termites (Isoptera) at emergences; also larvae of flies (Diptera) and beetles. Stomachs often contain grit, apparently to aid digestion. Identifiable prey items fed to chicks were invariably insects, including caterpillars and moths (Lepidoptera), grasshoppers, mantids, beetles, fly larvae, ants and termites; roughly half of food brought to chicks is collected outside territory. Forages on ground, singly or in groups, sometimes large flocks outside breeding season. Searches ground for items; often forages in areas with plentiful game, breaking open dung with the bill to obtain larvae. Occasionally undertakes brief aerial pursuits after flying moths or termites. In arid areas, regularly visits water to drink.
Breeding. Associated with rains or just before onset of rains (possibly to avoid nest flooding in poorly drained soils) in most areas, although after rains (Sept-Oct) in SW South Africa; peak in Aug-Oct in E South Africa, extending through to May in NW South Africa and Namibia; Aug-Sept in Zimbabwe and Zambia; Jul-Aug in Tanzania, and Mar-May and Nov-Dec in rest of E Africa; at least some pairs double-brooded, in one case laying in newly built nest 21 days after brood had left first nest. Monogamous and territorial; breeds singly, but often at high densities, inter-nest distance usually at least 50 m, sometimes only 20-25 m. Male vigorously proclaims territory with undulating aerial display like that of a pipit (*Anthus*), rising steeply up to 50 m from ground, then alternately fluttering and diving, singing almost continuously, for up to 10 minutes; sometimes resorts to fights on ground, with threat displays including crouched posture with fanned tail and raised, quivering wings; occasionally chases other species away from nest-site. Nest built mainly by female, in 4-5 days, an open cup, lined with grass and other vegetation, in shallow hollow on ground, usually at base of a shrub or grass tuft, often with "apron" of coarse material (soil, dung, pebbles) on exposed side; in hot, arid areas nests situated predominantly on E or SE side of sheltering vegetation, apparently for shading from afternoon sun. Clutch 2-3 eggs, rarely 4 (mean 2·2), laid one per day; incubation by female alone, fed on nest by male, period lasts 12-15 days; hatching synchronous, suggesting that incubation starts with final egg, parents remove eggshell fragments after hatching; chicks cared for by both parents, female probably doing majority of brooding and provisioning, brooded for up to 7 days, shaded on hot, still days by parent standing over them; during middle of day chicks fed 2-23 times (average 8 times) per hour, average hourly rate of feeds increased with brood size, 4·4 for single-chick nests, 10·8 for two chicks and 13 for three chicks; male tends to make fewer visits but delivers more food on each visit; parents remove faecal pellets from nest rim; adults occasionally feign injury to distract predators, but this rare; chicks remain in nest for 9-18 days, mean 12 days. In South Africa, crude breeding success in one study was 61%, with hatching success 81% and fledging success 76% (but hatching success overestimated owing to failure to include eggs lost before nests found), and in another study, in E grasslands, success much lower, less than 10%; in both studies, predation major cause of nest failure, other causes including starvation of chicks, nest desertion, egg damage by parent, fire, and nest burial by mole-rat (*Bathyergus*) diggings; in one study 2-egg clutches tended to produce greater relative success (1·5 chicks fledged per nest) than 3-egg clutches (2 chicks per nest).
Movements. Poorly understood. Some populations resident; others move extensively, usually in response to local conditions, and some apparently undertake regular migrations. Race *saturatior* is a dry-season (Jul-Oct) breeding visitor to Zambia and Malawi; unclear where this population goes at other times, but may migrate N, perhaps even crossing the equator. Vagrants recorded in N Gabon and PRCongo.
Status and Conservation. Not globally threatened. Common to locally abundant in S, becoming more local and uncommon in N; common but patchily distributed in E Africa; uncommon and very local in Nigeria. Breeding densities of up to 2-4 pairs/ha in South Africa. In non-breeding season, average flock size in the Karoo (South Africa) of 8 individuals, but flocks of up to 100 birds are regular, and rarely even gatherings of thousands. Has probably benefited from human activities in many areas, as often prefers agricultural lands and heavily grazed areas for foraging.
Bibliography. Benson & Benson (1977), Benson *et al.* (1971), Borrett & Wilson (1971b), Byaruhanga *et al.* (2001), Clancey (1952b, 1964b, 1971, 1977a, 1978a, 1978b), Dean (1997, 2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Keith *et al.* (1992), Kleynhans (1996), Konigsstedt & Robel (1985), Lewis & Pomeroy (1989), MacGregor & Feely (1952), Mackworth-Praed & Grant (1960, 1962, 1970), Maclean (1993a), Muchai (2002), Penry (1994), Peters (1999), Sangha (1999), Short *et al.* (1990), Sinclair & Hockey (1996), van Someren (1956), Stevenson & Fanshawe (2002), Tarboton (2001), White (1959a), Winterbottom & Wilson (1959), Zhang Wenguang (1982), Zimmerman *et al.* (1996).

71. Blanford's Lark
Calandrella blanfordi

French: Alouette de Blanford **German**: Blanfordlerche **Spanish**: Terrera de Blanford
Other common names: Blanford's Short-toed Lark

Taxonomy. *Tephrocorys blanfordi* Shelley, 1902, Senafé, Tigré, Eritrea.
May form a superspecies with *C. brachydactyla*, *C. cinerea*, *C. erlangeri* and *C. acutirostris*; often considered conspecific with first three (especially *C. cinerea* and *C. erlangeri*). Three subspecies recognized.
Subspecies and Distribution.
C. b. eremica (Reichenow & J. L. Peters, 1932) - SW Saudi Arabia and Yemen.
C. b. blanfordi (Shelley, 1902) - N Eritrea.
C. b. daaroodensis C. M. N. White, 1960 - N Somalia.

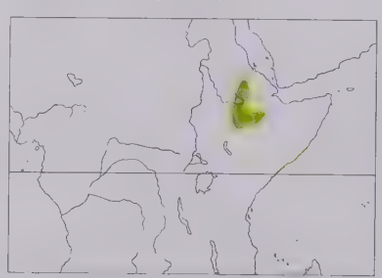


Descriptive notes. 13-14 cm. Medium-sized lark, adult with rufous crown feathers sometimes erected to form prominent short crest. Nominate race has relatively plain face, with whitish supercilium and lores; upperparts rather pale, sandy brown, with darker brown feather centres; rump and uppertail-coverts more uniform tawny-sand; flight-feathers dusky brown, paler buffish-brown margins (broader on inner secondaries and tertials); tail dark brown, central feathers with broad buffy margins, outer feathers with white tips and outer webs; white below, breast and flanks washed pinkish-buff, black patch on breast side surrounded by rich rufous (on some individuals black extends across breast to form almost complete pectoral band); eyes, bill and legs dark brown. Distinguished from very similar *C. cinerea* by black-centred pectoral patches; from *C. erlangeri* by distinctly paler and less streaked upperparts, paler rufous crown without black streaking, typically smaller pectoral patches. Sexes alike. Juvenile undescribed, probably similar to juvenile *C. cinerea*. Race *daaroodensis* is smaller and paler than nominate; *eremica* has darker rufous crown with blackish lateral streak anteriorly, blackish loral streak, yellower bill. Voice. Song (race *eremica*), in flight, described as repeated "chew" notes mixed with call-like notes and more liquid phrases; calls include dry "grlit-drlit" in flight, also "pit-wit-pit" twitter, also "peeeep" and softer "tsru".
Habitat. Open grassland and bare ground, including stony areas. Generally avoids bushed areas in Africa, but found in wadis with occasional bushes and scattered trees in Arabia. Occurs at 600-1800 m in Somalia; in Arabia mostly above 900 m, mainly 1800-2500 m, lower in winter.
Food and Feeding. Mostly small seeds; also a few insects, including grasshoppers (Acrididae) and beetles (Coleoptera). Feeds on the ground.
Breeding. No documented information; nest and eggs unknown. A nest possibly of this species found in N Somalia in Jun, held 6 eggs, but identity of female unconfirmed. In Arabia (*eremica*), male performs circular, slightly undulating song flight.
Movements. Resident, probably subject to local movements. Vagrant reported in Oman.
Status and Conservation. Not globally threatened. Locally common. Often in flocks when not breeding, but no information on size of such gatherings. Poorly known species.
Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Friedmann (1937), Keith *et al.* (1992), Mackworth-Praed & Grant (1960), Meinertzhagen (1954a), Sinclair & Ryan (2003), Smith (1957), Urban & Brown (1971), White (1960b), Zinner (2001).

72. Erlanger's Lark
Calandrella erlangeri

French: Alouette d'Erlanger **German**: Erlangerlerche **Spanish**: Terrera de Erlanger
Other common names: Erlanger's Short-toed/Ethiopian Short-toed Lark

Taxonomy. *Tephrocorys cinerea erlangeri* Neumann, 1906, Sheikh Mehamed, Webi River, Ethiopia.
May form a superspecies with *C. brachydactyla*, *C. cinerea*, *C. blanfordi* and *C. acutirostris*; often considered conspecific with first three (especially *C. cinerea* and *C. blanfordi*). N populations on average slightly paler and are less streaked above, sometimes separated as race *asmaraensis*. Monotypic.
Distribution. Ethiopian Highlands.



Descriptive notes. 13-14 cm. Medium-sized lark, adult with reddish crown feathers that can be raised into prominent short crest. Has plain face, with whitish supercilium and lores; crown rufous, often blackish on forecrown and streaked blackish on hindcrown; upperparts sandy brown, blackish feather centres forming prominent streaks, rump and uppertail-coverts more uniform tawny-sand (in worn plumage appears darker above); flight-feathers and tail dark brown with paler buff-brown margins, broader on inner secondaries, tertials and central rectrices, outer rectrices with white outer webs; white below, breast and flanks washed rufous, becoming darker towards breast side and merging with large black pectoral patch;

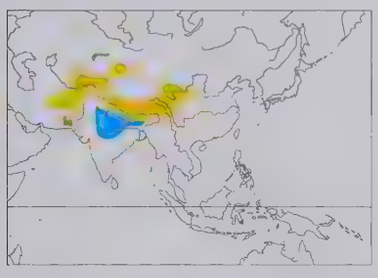
eyes, bill and legs dark brown. Differs from *C. cinerea* and *C. blanfordi* in generally darker appearance, large black pectoral patches, darker crown. Sexes alike. Juvenile undescribed, probably similar to dark juvenile of *C. cinerea*. Voice. Male song, in flight, a series of whistles and short trills, may include mimicry of other birds; flight call a loud "chwerp", like call of sparrow (*Passer*); vocalizations similar to those of *C. cinerea*.
Habitat. Open grassland and fields; often occurs in large numbers on recently ploughed land.
Food and Feeding. Diet unknown; feeds on the ground.
Breeding. Breeds May-Jun. Male has undulating aerial display, rising steeply up to 50 m and then alternately fluttering and diving, while singing almost continuously, for up to 10 minutes; similar to *C. cinerea* display. Nest and eggs undescribed.
Movements. Probably largely resident, but subject to local movements.
Status and Conservation. Not globally threatened. Common. Often in flocks when not breeding, but no information on flock sizes. Relatively poorly known species.
Bibliography. Desfayes (1975), Francis & Shirihai (1999), Friedmann (1937), Keith *et al.* (1992), Mackworth-Praed & Grant (1960), Sinclair & Ryan (2003), Urban & Brown (1971), White (1960b).

73. Hume's Lark

Calandrella acutirostris

French: Alouette de Hume **German**: Tibetlerche **Spanish**: Terrera de Hume
Other common names: Hume's Short-toed Lark, Slender-billed Lark

Taxonomy. *Calandrella acutirostris* Hume, 1873, Sughet Pass, south-west Xinjiang, China.
May form a superspecies with *C. brachydactyla*, *C. cinerea*, *C. blanfordi* and *C. erlangeri*. Two subspecies recognized.
Subspecies and Distribution.
C. a. acutirostris Hume, 1873 - breeds NE Iran E to S Kazakhstan, Afghanistan, Pakistan and extreme W China (W Xinjiang); winters mainly Pakistan and NW India.
C. a. tibetana W. E. Brooks, 1880 - breeds NE Pakistan and NW India E across Tibetan Plateau to C China (S Gansu, extreme W Ningxia & NW Sichuan) and S to Nepal and Sikkim; winters N Indian Subcontinent.



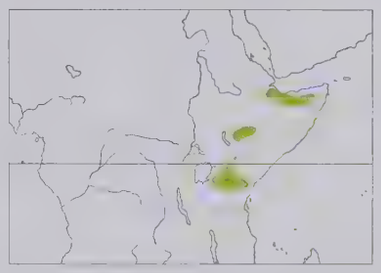
Descriptive notes. 13-14 cm. Small, neat, rather pale lark with long tertials almost cloaking tips of folded wings. Nominate race has white supercilium, and distinct dark loral spot; overall grey-brown or brown-grey above, crown slightly rufous-tinged and faintly dark-streaked (often appears almost uniform), hindneck rather plain, upperparts fairly heavily streaked dark, uppertail-coverts rufous-tinged; wings dark grey-brown, upperwing-coverts and tertials with buffish tips and edges, remiges with narrow pale edges; tail blackish-brown, central feather pair with broad brownish edges, outermost pair with whitish outer web and usually some pale on inner web (sometimes none, occasionally a prominent pale wedge); whitish below, breast washed buffish to more brown-grey, small blackish patch on side of lower neck/upper breast (can be obscured in fresh autumn plumage); bill pale brownish-yellow or greyish-yellow, culmen and tip of lower mandible dark grey; legs pinkish to brownish. Distinguished from very similar *C. brachydactyla* (of greyish race *longipennis*) by less contrastingly streaked crown, dark loral stripe, better-defined whiter and narrower but more contrasting supercilium, usually less white on outer rectrix, usually longer and more slender and pointed bill with yellow coloration and darker culmen; in the hand, 6th primary (numbered descendently) marginally shorter (not considerably shorter) than wingtip, and three (not two) distinct emarginations of primaries. Sexes similar in plumage, female on average smaller than male. Juvenile has distinct whitish fringes and dark subterminal bands above, lacks dark patch on neck/breast side (breast side indistinctly dark-spotted), has shorter tertials than adult (not reaching tip of wing), very similar to juvenile *C. brachydactyla*. Race *tibetana* is paler, greyer and less prominently streaked on upperparts than nominate, also has less marked head pattern, with supercilium generally less distinct, especially in front of eye, dark loral stripe less obvious (can appear to be absent). Voice. Song, mainly in high flight, short strophes of varied short (though often rather complex) notes interspersed with relatively long pauses, resembles that of *C. brachydactyla* but usually slower and includes more whistles and harsh notes; when on ground, or in low flight (or during ascent to high song flight), strophes more irregular and pauses often shorter, individual song elements tend to be shorter than in high flight, and song includes drawn-out whistles (often repeated many times), call notes and sometimes imitations of other birds. Commonest call a dry, harsh, rattling or even rasping "chirr" or "chirrrp", harsher, more rattling and more drawn out than corresponding call of *C. brachydactyla*.
Habitat. Breeds in sandy and gravelly habitats with very sparse vegetation, at elevations of 1000-5000 m. Winters in similar or slightly less barren habitats at low altitudes; often found together with *C. brachydactyla* (of race *longipennis*) in non-breeding season, but usually not in mixed flocks.
Food and Feeding. Food poorly known; seeds and invertebrates. Forages on ground, in flocks in non-breeding season.
Breeding. Little studied. Season mainly May-Aug, chiefly from Jun at higher altitudes; probably two broods. Song-flighting male rises high, and hangs more or less still or circles somewhat, alternating between a few wingbeats and short dipping glides on spread wings and partly fanned tail. Nest, built by both sexes, a depression in ground, generally sheltered by tussock, lined with grass, hair and some moss, sometimes rimmed with gravel. Clutch 2-4 eggs, usually 3; conflicting reports on role of sexes in incubation, either by female alone or by both sexes, period 10-11 days; chicks fed by both parents, leave nest at 10-11 days.
Movements. Migratory. Nominate race winters mainly in Pakistan and NW India; *tibetana* in Nepal, N India, Bhutan and Bangladesh. Leaves Tibetan Plateau at the latest in Oct; present in NW India between late Sept and early May; arrival back on Tibetan Plateau from early Apr, and in W Tien Shan in late Apr to early May. Status in NE Iran requires confirmation, and species might be merely vagrant. Recorded as vagrant in Israel.
Status and Conservation. Not globally threatened. Locally common; scarce in some areas. Frequent to scarce in Pakistan; in India, common in Ladakh but less common in Sikkim; common in NW Nepal; rare to locally abundant in China. Apparently rare in NE Iran and Bhutan, though limited information. No population estimates available.
Bibliography. Ali & Ripley (1987), Alström *et al.* (2004), Dementiev *et al.* (1970), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Étchécopar & Hüe (1983b), Gavrilov (1999), Grimmett *et al.* (1998), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Pätzold (1994, 2003), Porter *et al.* (1996), Rasmussen & Anderton (2004), Ripley (1982), Roberts (1992), Shirihai (1996, 1999), Shirihai & Alström (1990), Sinha & Sinha (1984), Snow & Perrins (1998), Stepanyan (1971, 1990), Stuart Baker (1926, 1935), Vaurie (1951a, 1959, 1972), Whistler (1932).

74. Somali Short-toed Lark

Calandrella somalica

French: Alouette roussâtre **German**: Somalilerche **Spanish**: Terrera Somalí
Other common names: Rufous Short-toed Lark; Athi Lark/Short-toed Lark (*athensis*)

Taxonomy. *Alaudula somalica* Sharpe, 1895, Haud, north Somalia.
May form a superspecies with *C. rufescens*, with which sometimes treated as conspecific, and *C. raytal*. Distinctive race *athensis* sometimes considered a separate species. Described race *vulpecula* (from N Somalia) considered synonymous with nominate. Birds recorded in C Kenya of uncertain racial identity, tentatively included in *megaensis*. Four subspecies recognized.
Subspecies and Distribution.
C. s. perconfusa C. M. N. White, 1960 - NW Somalia.
C. s. somalica (Sharpe, 1895) - E Ethiopia and N Somalia.
C. s. megaensis Benson, 1946 - S Ethiopia and N & C Kenya.
C. s. athensis (Sharpe, 1900) - S Kenya (S from Nairobi National Park and Athi Plains) and N Tanzania.



Descriptive notes. 13-14 cm. Heavily streaked, medium-small lark with prominent buffy supercilium, pale lores and crescent under eye, giving "spectacled" appearance, contrasting with darker ear-coverts and moustachial stripe. Nominate race has crown and upperparts bright rufous, heavily streaked dark (especially crown, mantle and back); wings and tail dark brown, wing-coverts and tertials with broad reddish margins, remiges and rectrices with rufous outer webs, outer rectrices with buff outer webs; underparts washed bright pinkish-buff, especially on flanks, breast with well-defined blackish streaks, streaks sometimes coalescing at side of breast to form small dark pectoral patch; eyes dark brown; bill brown above, pale below; legs pale flesh or greyish-white. Sexes alike. Juvenile undescribed. Race *perconfusa* differs from nominate in being less bright above, edgings pale sandy to reddish-buff, whitish below, flanks variably buff, bill pinkish-horn with slightly paler base; *megaensis* is more heavily streaked above than previous, edgings reddish-brown, breast and flanks washed warm brownish; *athensis* is duller, cold grey-brown with broad dark streaks above, white below, breast and flanks washed pale brown. Voice. Song, usually in high flight, also from ground, a protracted series of trills and whistles with some mimicry, similar to that of *Alauda arvensis*; N races (nominate, *perconfusa*) include more scratchy elements as well as distinct clear notes, similar to *C. brachydactyla* and *C. rufescens* but with more distinct notes. Typical call a soft, low "trrrt", in flight or when flushed, combined calls of individuals in flocks producing soft chittering.
Habitat. Dry open grassland, at 600-1600 m in Somalia and 1200-1800 m in Kenya and N Tanzania; prefers areas with slightly taller tussock grasses that provide some cover. More rufous-coloured nominate race occurs on red sands in N Somalia.
Food and Feeding. Diet unknown. Forages on the ground, often in large flocks outside breeding season.
Breeding. Jun in Somalia and Apr-Jun in Kenya and Tanzania. Monogamous; nests singly. Male advertises and defends territory by means of aerial displays. Nest is an open cup of dry grass, built in a shallow scrape in the ground, usually at the base of a grass tuft. Clutch 4-5 eggs in N (nominate), 2-3 eggs in S (*athensis*); nothing known about parental duties or incubation and fledging periods.
Movements. Resident; locally nomadic, moving short distances to follow rain events.
Status and Conservation. Not globally threatened. Common to locally common; often in large flocks when not breeding, although no details on exact numbers. Range of *athensis* has contracted in S Kenya; formerly occurred farther N, to Naivasha region and plains at foot of Mt Kenya; in Tanzania, present in Serengeti and Arusha National Parks.
Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Bennun & Njoroge (1999), Demey (2004b), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

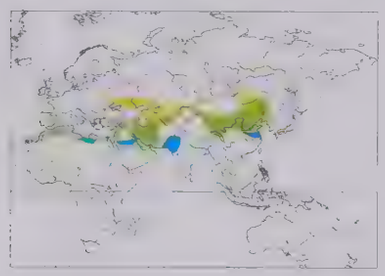
75. Lesser Short-toed Lark

Calandrella rufescens

French: Alouette pispolette **German**: Stummellerche **Spanish**: Terrera Marismeña
Other common names: Common/Rufous Short-toed Lark/Sand Lark; Asian/Eastern/Mongolian Short-toed/Grey Short-toed Lark, Lesser Sand Lark (E races)

Taxonomy. *A[lauda] rufescens* Vieillot, 1820, Tenerife, Canary Islands.
May form a superspecies with *C. somalica*, until recently considered conspecific, and *C. raytal*; has sometimes been considered conspecific also with latter, but considerable differences in morphology, song and habitat choice. Was in the past sometimes referred to as *C. pispoletta*; that name has priority, but uncertain whether it applies to present species or to another member of the group. Geographical variation marked and complex; E races often treated as a separate species "*C. cheleensis*", largely on grounds of apparent overlap of races *heinei* and *leucophaea* in region from Turkmenistan to S Kazakhstan, but not clear which taxa should be included within it, usually those E from Turkmenistan, although some authors have included races from as far W as Ukraine (*heinei*) and C Turkey (*niethammeri*); further study needed. Race *tangutica* sometimes merged with *kukunoorensis*, and *stegmanni* with *beicki*. Birds from Transbaikalia named as race *obscura*, but indistinguishable from *cheleensis*; others from Tuva Republic and NW Mongolia described as *tuvinica*, synonymized with *seebohmi* but possibly a valid race; *aharonii* (described from wintering specimens in C Syria) is probably a synonym of *persica*. Sixteen subspecies currently recognized.
Subspecies and Distribution.
C. r. rufescens (Vieillot, 1820) - Tenerife, in WC Canary Is.
C. r. polatzeki Hartert, 1904 - E Canary Is (Gran Canaria, Fuerteventura, Lanzarote).

C. r. apetzii (A. E. Brehm, 1857) - S Portugal and S & E Spain.
C. r. minor (Cabanis, 1851) - N Africa (from S Morocco E to NW Egypt) and from S Turkey S to N Sinai Peninsula and E to C Iraq.
C. r. nicolli Hartert, 1909 - Nile Delta (N Egypt).
C. r. heinei (Homeyer, 1873) - breeds Ukraine E to E Kazakhstan (Semipalatinsk region), S to Aral Sea and Syr Darya Valley.
C. r. leucophaea Severtsov, 1873 - breeds Turkmenistan, Uzbekistan (S of Kyzyl Kum) and SE Kazakhstan E to L Balkhash and Fergana Basin.
C. r. niethammeri Kumerloeve, 1963 - C Turkey (Anatolian High Plateau).
C. r. pseudobaetica Stegmann, 1932 - E Turkey, Armenia, Azerbaijan and NW Iran.
C. r. persica (Sharpe, 1890) - E & S Iraq, Iran (except NW) and W & SW Afghanistan.
C. r. seebohmi (Sharpe, 1890) - S Russia (Tuva), W Mongolia and extreme NW China (Xinjiang, from Tien Shan S to Kashgaria, E to R Khostan).
C. r. beicki Meise, 1933 - SW Mongolia and bordering areas of N China (Gansu, Ningxia).
C. r. stegmanni Meise, 1937 - NC China (NW Gansu).
C. r. kukunoorensis (Przevalski, 1876) - WC China (Qaidam Basin, in N Qinghai).
C. r. tangutica Hartert & Steinbacher, 1933 - S Qinghai and NE Tibet.
C. r. cheleensis (Swinhoe, 1871) - Transbaikalia, NE Mongolia and NE China (S Heilongjiang and Inner Mongolia S to S Shaanxi and N Jiangsu).



Descriptive notes. 13-14 cm; c. 20-27 g. Short-billed, small, heavily streaked lark with whitish narrow supercilium and wide eyering, short, thick-based bill, shortish broad-based wings with relatively long primary projection (tertials end c. 10-15 mm short of wingtips), reduced narrow outer primary (7-12 mm short of primary-covert tips), rather short tail; hind claw short (6-10 mm). Nominate race is distinctive, deep rufous brown above, crown (erectile) with prominent fine blackish streaks, upperparts with broader dark streaks, rump paler with fewer or no streaks; dark-centred median wing-coverts contrast somewhat with rest of upperwing; white outer web of outer rectrix; white below, breast and sides washed light cinnamon-rufous, chest finely and densely streaked dark, streaks usually extending to flanks; bill horn-grey, darker on culmen, base of lower mandible yellowish; legs brownish-flesh to yellowish-brown. Sexes similar. Juvenile has some spotting on upperparts, longer outer primary (with rounded, not pointed, tip) reaching more or less tips of primary coverts. Races vary considerably, mainly in ground colour, width of streaking, amount of streaking on chest and flanks (also in size of wing and tail, and length and shape of bill), and following details only a general guide chiefly to fresh-plumaged birds: *polatzeki* is less rufous than nominate, more sandy brown, with finer streaks above and below; *apetzii* is greyer or buffish-brown with very heavy streaking, more strongly and extensively streaked below; *minor* is buffish sandy to brownish, streaks small; *nicolli* has more warm brown crown and upperparts, broadly streaked, flanks usually unstreaked; *heinei* is paler, grey-brown with well-defined moderate streaking, whiter ground colour below; *niethammeri* is slightly paler and greyer than previous, contrasting black streaks above, chest with thin short black streaks; *pseudobaetica* has heavily streaked rather dark grey-brown upperparts, relatively small size; *persica* is larger and heavier-billed, pale sandy grey above, tinged cinnamon, with narrow streaks, more sparsely streaked below; *leucophaea* is very pale and plain, greyish-white above (looking almost unstreaked in fresh plumage), fewer streaks below, has bolder and whiter supercilium, more white in tail; *seebohmi* is similar to previous, but more sandy and yellowish; *kukunoorensis* is darker and browner than last, more heavily streaked above and below; *tangutica* closely resembles previous, streaks perhaps blacker; *beicki* is more rufous above than previous, breast spotting less distinct; *stegmanni* is like last, but apparently somewhat longer-winged, plumage perhaps very marginally paler and greyer; *cheleensis* is dark brown, darker and less rufous than last two. Voice. Song, mostly in flight, sometimes from ground or low perch, varied and vivacious, a continuous melodious mix of rattles, churrs, trills and whistles with squeaking sounds and buzzy and grating notes, often interspersed with excellent imitations of other bird species, and with only brief and irregular pauses; very different from that of *C. brachydactyla* (which it also mimics). Commonest call a long, dry, buzzing "prrrit" or "chirrick".

Habitat. Open land with shrubs and grasses, and with high percentage of bare ground. Usually in level terrain, but also on slopes; on lime, clay, gypsum or saline soils, also on stony ground in N Africa. In Mediterranean Basin, selects areas with average shrub height 50 cm and bare ground c. 60%; often in saltmarshes with glasswort (*Salicornia*), which apparently preferred in winter. In Turkey and S & E of range found in steppe-like landscapes and semi-deserts, also dry plains and saltflats. Non-breeding visitors in N Indian Subcontinent recorded in sandy semi-deserts and stony foothills. Mostly at low or medium altitudes, to 800 m in Spain; to at least 2000 m in Turkey and to 3000 m in Transcaucasia (*pseudobaetica*). Compared with *C. brachydactyla*, prefers hotter areas and saline or gypsum substrates.

Food and Feeding. Invertebrates and seeds; fruits and bulbs also taken. Diet varies seasonally, mainly invertebrates in spring, mixed in summer, and predominantly seeds in winter. Items taken seem related to abundance of different taxa, with mainly caterpillars in spring and grasshoppers (Acrididae) in summer, although variations occur from one year to another. Nestlings in Spain fed only with insects, mainly grasshoppers, heteropteran bugs, caterpillars and beetle (Coleoptera) larvae, length 6-12 mm. Feeds on the ground, in small parties or larger flocks. Searches ground for food items.

Breeding. Laying from mid-Mar in Canary Is and Israel; elsewhere Apr-Jul, mainly May-Jun; often two broods, sometimes three. Probably monogamous; some pair-members show fidelity during successive clutches, but extra-pair paternity also recorded. Nests singly, sometimes in loose groups with inter-nest distance 100 m or less; territorial. Male song flight, at heights of c. 20-30 m (Canary Is), sometimes higher, in wide circles and with changes of speed, but usually without undulations. Nest built by female, a small scrape on ground beside small shrub or tuft, or in open, lined with vegetation, internal diameter 5-6 cm; earliest nests in season have small rampart of sticks; main orientation in Spain to NE-NW quarter. Clutch 2-6 eggs, usually 3-4 (mode 3); clutch size increases through season in Spain; incubation by female, sometimes assisted by male, begins with last egg, period 13-14 days; chicks cared for and fed by both sexes, nestling period 9 days, sometimes longer, to 12 days, fledging up to c. 15 days. Nest losses often high, as much as 80-90%; possible interspecific nest parasitism by *C. brachydactyla* and *Eremophila bilopha* recorded. Longevity at least 5 years.

Movements. W populations resident, and sedentary or wandering in small flocks, but in N Africa larger movements reported. C & E populations migratory, partly migratory or sedentary; those from N parts of range winter S to Middle East, NW Indian Subcontinent and C & E China. Considerable annual variation in numbers of migrants reported, apparently at least partly dependent on amount of precipitation in region; in Israel flocks generally of up to 500 (exceptionally 1500) in autumn and fewer in spring, but occasional irruptions recorded, e.g. at least 2500 in Arava Desert in spring 1989. Vagrants recorded N to C Europe (several countries), Britain and Fennoscandia, also on Mediterranean islands (Balearics, Sicily, Malta, Crete), in Bulgaria, Romania and, in far E, Japan.

Status and Conservation. Not globally threatened. Rather common throughout very extensive range; locally scarce, but in some places abundant. Often localized, but attaining high densities in favourable habitats, e.g. 1-3 birds/ha in Spain. In W, common and widespread in E Canary Is, where estimated 17,000-19,000 pairs (mostly on Lanzarote and Fuerteventura); widespread over much of steppe country of C Morocco and Hauts Plateaux, N to coast; more rare and local than *C. brachydactyla* in Algeria, occurring in large flocks at Constantine Plateau; common in Tunisia (mainly coastal areas); in Egypt, fairly common in Nile Delta saltmarshes. Highly disjunct distribution in Europe, with estimated 230,000-260,000 pairs in Spain (most in Ebro Valley and littorals of SW & SE), a few pairs on S coast of Portugal, c. 10,000-17,000 pairs in Ukraine, and perhaps more than 300,000 pairs in Russia; locally common to very common in Turkey (10,000-100,000 pairs), common to very common in Azerbaijan. Common in Israel and in Jordan (most abundant lark at Azraq); breeds in small numbers in Saudi Arabia when conditions favourable, not in every year (although probably most numerous breeding bird at Harrat Al Harrah Reserve); may breed locally in Qatar. Common, in places numerous, in Asia within former URSS; fairly common in China. Possibly breeds in W Pakistan. Decreases reported in Iberia, where species is locally regarded as "near-threatened" (race *apetzii*), and in Canary Is, where considered "endangered" on Gran Canaria (*polatzeki*) and "critical" on Tenerife (nominate); threatened by habitat loss brought about by agriculture and touristic developments, also locally by excessive predation, e.g. on Tenerife by introduced predators including rats (*Rattus*), cats and hedgehogs (*Erinaceus*).

Bibliography. Adamian & Klem (1999), Ali & Ripley (1987), Alström *et al.* (1991, 1992), Anon. (2000a, 2001d, 2001e), Bannerman (1963), Barone (2002), Beaman *et al.* (1975), Bergmann & Helb (1982), Bernis (1971), Bian *et al.* (1988), Brazil (1991), Bub & Herroelen (1981), Bundy (1976), Bundy & Warr (1980), Burri (1990), Cañadas *et al.* (1982), Chen Zuoping & Zhang Weigong (1985), Cheng Tsohsin (1987), Clarke (1980), Cramp (1988), Dementiev *et al.* (1970), Dennis & Wallace (1975), Dickie & Vinicombe (1995), Dickinson & Dekker (2001a), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Esilevskaya (1970), Étchécopar & Hüe (1964), Flint & Stewart (1992), Gallagher & Woodcock (1980), Gergely (1991), Glutz von Blotzheim & Bauer (1985), González & Lorenzo (2001), Goodman & Ames (1983), Goodman *et al.* (1989), Goriup (1988a), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Heath *et al.* (2000), Heatwole & Muir (1982), van Heezik & Seddon (1999), Heim de Balsac (1936), Heim de Balsac & Mayaud (1962), Herranz *et al.* (1997), Hollom *et al.* (1988), Hsu Weishu (1988), Hüe & Étchécopar (1970), Iapichino & Massa (1989), Isenmann & Moali (2000), Jarry (1969), Jennings (1980b, 1981), de Juana *et al.* (1988), Keith *et al.* (1992), Kjellen (1991), Konigsstedt & Robel (1985), Kumerloeve (1963), Lansdown (1999), Ledant *et al.* (1981), MacKinnon & Phillipps (2000), Mackworth-Praed & Grant (1960, 1970), Makatsch (1976), Manrique & Yanes (1994a), Marchant (1963), Martín (1987), Martín & Lorenzo (2001), Mayaud (1985), Meinertzhagen (1951, 1954a), Meyer de Schauensee (1984), Moore (1989), Mountfort (1954), Nankinov (2001), Popenko (1979), Ramadan-Jaradi & Ramadan-Jaradi (1999), Richardson (1990), Ripley (1982), Roberts (1992), Roselaar (1995), Rufino (1989), Sackl (1994), Samprieto & Pelayo (2003), Sánchez *et al.* (1997), Schönwetter (1979), Shirihai (1996), Shishkin (1980), Simms (1992), Smith (1965), Snow & Perrins (1998), Stepanyan (1967), Suárez & Manrique (1992), Suárez, Garza & Morales (2002), Suárez, Manrique & Yanes (1991), Suárez, Yanes *et al.* (1993), Sultana & Gauci (1982), Svensson *et al.* (1999), Tellería *et al.* (1999), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Valverde (1961), Vaurie (1951a, 1959), Velasco *et al.* (2002), Wallace (1983, 1984), White (1961a), Yanes (2000), Yanes & Oñate (1996), Yanes & Suárez (1996a, 1996b, 1997), Yanes, Herranz, Manrique *et al.* (1997), Yanes, Herranz & Suárez (1995, 1996).

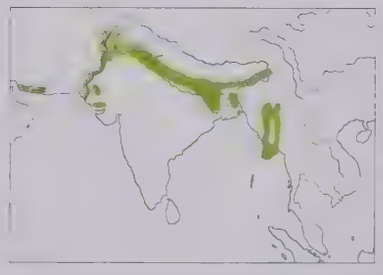
76. Sand Lark

Calandrella raytal

French: Alouette raytal **German**: Uferlerche **Spanish**: Terrera Raytal
Other common names: Asian/Indian Short-toed Lark, Indian Sand Lark, Raytal Lark

Taxonomy. *Alauda raytal* Blyth, 1845, Lucknow, India.
May form a superspecies with *C. somalica* and *C. rufescens*; has been treated as a race of latter, but differs in morphology, song and habitat choice. Named race *vauriei*, known only from type locality in NE India (Palasbari, in Assam), synonymized with nominate. Race *adamsi* intergrades with nominate in N India (Haryana). Three subspecies recognized.

Subspecies and Distribution.
C. r. adamsi (Hume, 1871) - SE Iran, Pakistan and NW India (Punjab, Haryana, NW Gujarat).
C. r. raytal (Blyth, 1845) - N India (E from Haryana to Arunachal Pradesh), Nepal, Bangladesh and C & S Myanmar.
C. r. krishnakumarsinhji Vaurie & Dharmakumarsinhji, 1954 - Bhavnagar, in S Gujarat (W India).



Descriptive notes. 12-13 cm. Small, pale lark with comparatively long, slender bill, relatively short tail, distinct primary projection. Nominate race has pale greyish-white supercilium; crown and upperparts pale brownish-grey with faint thin dark streaks, upperwing-coverts and tertials medium grey-brown with pale buffish or buffish-white tips and edges; remiges dark grey-brown; tail feathers dark grey-brown, central pair with narrow greyish edges, outermost pair with large white wedge on inner web; whitish below, fine dark streaks across breast; bill pale greenish or pale brownish-yellow, darker culmen; legs pinkish. Differs from *C. rufescens* (mainly races *persica* and *leucophaea*) in smaller size, proportionately longer and slimmer bill and shorter tail, less distinctly streaked upperparts. Sexes similar in plumage, female on average smaller than male. Juvenile has whitish fringes and indistinct dark subterminal bands above. Race *adamsi* resembles nominate, but bill shorter and slightly thicker; *krishnakumarsinhji* has bill like previous but is darker and more heavily streaked above. Voice. Song, mainly in high flight, rather short (usually 2-4 seconds), dry, rattling, slightly "undulating" strophes interspersed with fairly long (often 10 seconds or more) pauses, resembles that of *C. rufescens* but slightly less varied; when on ground, and in low flight (or during ascent to high song flight), sings with continuous flow of call notes (both dry rattling and whistled), single elements or complete strophes of the first song type and some mimicry, resembles corresponding song type of *C. rufescens* (of race *cheleensis*) but less varied. Call a low-pitched rolling "chirr", "cherr", "chirr-de" or similar, like calls of *C. rufescens*.

Habitat. Mainly dry, sandy riverbanks and islands in rivers. Race *adamsi* also occurs in sandy areas along coast and on dry margins of some large lakes (the only habitat where *krishnakumarsinhji* has been found).

Food and Feeding. Food poorly known. Small snails (of genera *Planorbis* and *Corbicula*), other invertebrates; also seeds, especially of *Salsola* and *Suaeda* and other Chenopodiaceae (which predominate in preferred habitat). Forages on the ground.

Breeding. In nominate race, season Feb-May, chiefly Mar and Apr; *adamsi* apparently breeds from mid-Mar to mid-May and, after good monsoons, also in Aug and Sept (thus probably attempting two broods). In high song flight, male hangs more or less still or drifts about, alternating between a few wingbeats and short glides; in low song flight (as well as during ascent to high one), flies about in irregular "circles" with characteristically slow, deep, "rowing" wingbeats and partly fanned tail, in similar form to corresponding song flight of *C. rufescens*. Nest, built by both sexes, a cup-like depression in the ground, often sheltered by small bush, stone or tuft of grass, lined with animal hairs and fine vegetable matter. Clutch usually 3 eggs, sometimes 2; both sexes participate in tasks of incubation and chick-feeding; incubation and nestling periods not documented.

Movements. Resident.

Status and Conservation. Not globally threatened. Locally common; no estimates of population size. Common in Pakistan, locally common in N India and Nepal, and fairly common but very local in Bhutan; local in Bangladesh; common in C & S Myanmar. Race *krishnakumarsinhji* recorded only at type locality in Gujarat (India), possibly vulnerable to habitat deterioration.

Bibliography. Ali (1996), Ali & Ripley (1987), Ali *et al.* (1996), Alström *et al.* (2004), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Grimmett *et al.* (1998), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Khan (1988), Meinertzhagen (1951), Mukherjee (1995), Patzold (1994, 2003), Porter *et al.* (1996), Rasmussen & Anderton (2004), Ripley (1982), Roberts (1992), Robson (2000), Smythies (1986), Stuart Baker (1926, 1935), Vaurie (1951a), Vaurie & Dharmakumarsinhji (1954).

PLATE 60



ssp *alpestris*

77

ssp *rubea*

ssp *strigata*

ssp *peregrina*

ssp *brandti*

ssp *penicillata*

ssp *bicornis*

ssp *teleschowi*

78

80

ssp *dunni*

79

ssp *eremodites*

ssp *conirostris*

81

ssp *damarensis*

82

ssp *makawai*

83

84

85

ssp *fremantlii*

86

ssp *delamerei*

ssp *megaensis*

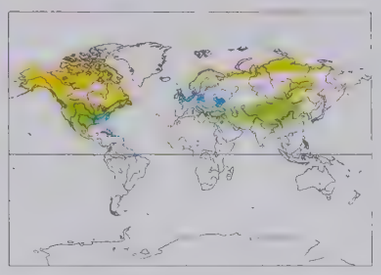
Genus *EREMOPHILA* Boie, 1828

77. Horned Lark

Eremophila alpestris

French: Alouette hausse-col **German**: Ohrenlerche **Spanish**: Alondra Cornuda
Other common names: Shore Lark; Przewalski's Lark (*teleschowi*)

Taxonomy. *Alauda alpestris* Linnaeus, 1758, coast of South Carolina, USA.
Genus distinct in plumage and structure, particularly bill structure; probably closest, although still distantly related, to *Alauda* and *Galerida*. Forms a superspecies with *E. bilopha*, formerly considered conspecific. Highly variable over vast range, and numerous races described, broadly separable into two main types: all New World races together with Old World *flava*, *brandti* and *atlas* (having black face mask not connected to black breastband), and remaining Old World races (mask usually joining with breastband). Races described mainly on basis of differences in size and in plumage ground colour (at least partly determined by local soil colour) and pattern, but many grade into each other, with many intermediates, and variation thus possibly clinal; some named taxa perhaps not sustainable, but all are listed, with breeding ranges, for sake of completeness; thorough review needed. Race *teleschowi* sometimes treated as separate species, apparently not interbreeding with other races where ranges overlap. Forty-two subspecies currently recognized.
Subspecies and Distribution.
E. a. arcticola (Oberholser, 1902) - Alaska and NW Canada (Yukon S to British Columbia).
E. a. hoyti (Bishop, 1896) - N Canada (N Baffin I S to N Alberta and W Ontario).
E. a. alpestris (Linnaeus, 1758) - E Canada (W Ontario E to Newfoundland).
E. a. merrilli (Dwight, 1890) - W coast of Canada and USA (British Columbia S to N California).
E. a. strigata (Henshaw, 1884) - coastal S British Colombia and NW USA (S to Oregon).
E. a. alpina (Jewett, 1943) - extreme NW USA (Olympic Mts and Cascade Range, in W Washington).
E. a. lamprochroma (Oberholser, 1932) - inland montane W USA (Washington S to N California and E to Nevada).
E. a. leucolaema Coues, 1874 - SW Canada (S Alberta) S to WC USA (S to Colorado and New Mexico).
E. a. enthymia (Oberholser, 1902) - Great Plains from SC Canada (Saskatchewan, Manitoba) S in USA to Oklahoma and Texas.
E. a. praticola (Henshaw, 1884) - E USA (from Minnesota) E to SE Canada (E to Nova Scotia), S to Kansas and N Carolina.
E. a. sierrae (Oberholser, 1920) - mountains of NE California.
E. a. rubea (Henshaw, 1884) - C California.
E. a. utahensis (Behle, 1938) - montane WC USA (Idaho S to C Nevada and Utah).
E. a. insularis (Dwight, 1890) - Channel Is, off SW California.
E. a. actia (Oberholser, 1902) - Coast Ranges of S California and extreme NW Mexico (N Baja California).
E. a. ammophila (Oberholser, 1902) - Mojave and Amargosa Deserts, in SE California and adjacent SW Nevada.
E. a. leucansiptila (Oberholser, 1902) - Colorado Desert from SW Nevada and W Arizona S to extreme NW Mexico (NE Baja California, NW Sonora).
E. a. occidentalis (McCall, 1851) - N Arizona E to C New Mexico.
E. a. adusta (Dwight, 1890) - S Arizona E to S New Mexico.
E. a. enertera (Oberholser, 1907) - C Baja California.
E. a. giraudi (Henshaw, 1884) - coastal S USA (S Texas) S to NE Mexico.
E. a. aphrasta (Oberholser, 1902) - NW Mexico (S to Durango).
E. a. lactea A. R. Phillips, 1970 - NE Mexico (Coahuila).
E. a. diaphora (Oberholser, 1902) - extreme SE Coahuila S to NE Puebla.
E. a. chrysolaema (Wagler, 1831) - S Mexican Plateau from Zacatecas S to Jalisco, Michoacan, Morelos and Veracruz.
E. a. oaxacae (Nelson, 1897) - S Mexico (E Oaxaca).
E. a. peregrina (P. L. Sclater, 1855) - E Andes of Colombia (Altiplano Cundiboyacense, N of Bogotá).
E. a. flava (J. F. Gmelin, 1789) - N Eurasia E to NE Russia (Anadyrland), S to S Norway, L Baikal and NW Amurland.
E. a. brandti (Dresser, 1874) - SE European Russia (lower R Volga) and N Transcaspia E to W Manchuria, S to N Turkmenistan, Tien Shan and Mongolia.
E. a. atlas (Whitaker, 1898) - Morocco (Atlas Mts).
E. a. balcanica (Reichenow, 1895) - SE Europe (S Balkans and Greece).
E. a. kumerloevei Roselaar, 1995 - W & C Asia Minor.
E. a. penicillata (Gould, 1838) - E Turkey and Caucasus E to N & W Iran.
E. a. bicornis (C. L. Brehm, 1842) - Lebanon and N Israel-S Syria border (Mt Hermon).
E. a. albigula (Bonaparte, 1850) - SW Turkmenistan and NE Iran E to W Tien Shan and S to NW Pakistan.
E. a. argalea (Oberholser, 1902) - N Ladakh, extreme W China (W Kun Lun Mts) and W Tibetan Plateau.
E. a. teleschowi (Przevalski, 1887) - C & E Kun Lun Mts from S Xinjiang E to NW Qinghai and S to N Xizang (W China).
E. a. przewalskii (Bianchi, 1904) - Qaidam Basin, in N Qinghai.
E. a. nigrifrons (Przevalski, 1876) - mountains of NE Qinghai.
E. a. longirostris (F. Moore, 1856) - Himalayas from NE Pakistan and Kashmir E to Sikkim.
E. a. elwesi (Blanford, 1872) - S & E Tibetan Plateau.
E. a. khamensis (Bianchi, 1904) - SC China (SE Xizang, W Sichuan).
Descriptive notes. 14-17 cm; 30-40 g. Medium-sized lark with short bill, fairly long tail, and striking head pattern with elongated lateral crown feathers ("horns"). Male nominate race has yellow forehead and supercilium, yellow from chin and throat extending across lower neck side to meet yellowish ear-coverts (latter darker and browner at rear), all contrasting with blackish central crown with elongated lateral feathers, blackish lores and broad band from eye down to cheek, and black chestband; central crown to upper mantle, also rump and uppertail-coverts, warm rufous-brown



with pinkish tinge, rest of upperparts greyer and dark-streaked, wings somewhat darker with pale edgings; tail blackish, central feathers paler and greyish, outer feathers edged white; underparts below chestband whitish, breast side to rear flank washed pinkish-rufous, breast streaked; bill dark grey to black; legs black. Non-breeding male has head pattern partly obscured (pale fringes), "horns" often shorter (often invisible in field). Female resembles male but smaller, slightly duller, with black bands on head and chest a little narrower. Juvenile has head and upperparts heavily mottled blackish and white, throat and lower neck side creamy whitish, chestband mottled; after autumn moult resembles adult. Races differ mostly in plumage colour and pattern, mainly of males, also in size (migratory races larger, darker and relatively longer-winged than resident ones, those in mesic habitats tend to be larger than those in arid habitats, and size also decreases with altitude): in N America, arctic races (e.g. *arcticola*) are somewhat darker and slightly less streaked above than nominate, nape pinkish, pale areas of face whitish (not yellow), W races (e.g. *merrilli*, *strigata*, *rubea*) have dark reddish nape to upper mantle and breast side, heavily streaked upperparts and bright yellow on head, those in interior W (e.g. *utahensis*) are paler and greyer with less streaking, palest and unstreaked in S deserts (*adusta*), greyer and streaked in S Texas (*giraudi*); Neotropical *peregrina* has forehead and supercilium whitish, throat yellow, nape greyish, upperparts dark grey with contrasting pinkish lesser and median coverts; in Eurasia, *flava* is very like American nominate (but with lesser coverts paler, less deep red), *atlas* is similar but paler, *brandti* is also similar but has pale areas on head whitish (not yellow); in most of remaining Old World races black of cheekband meets (or more or less meets) black of chestband, *balcanica* has yellow on face and throat, dark-streaked grey upperparts, *penicillata* has paler yellowish-white on head, pink hindneck, pink-tinged greyish-buff upperparts with fine streaks on mantle and scapulars, *kumerloevi* resembles previous but with unstreaked greyish-pink upperparts, *bicornis* has pale areas on head even whiter, crown to rump uniform plain sandy buff, tail-coverts tinged cinnamon, other E races generally rather pale, greyish to sandy, e.g. *albigula* has pale parts of head white, grey central crown and hindneck, finely streaked sandy grey upperparts, *longirostris* is slightly darker than previous, with black of cheekband and chest separated by white lower neck side, *teleschowi* is pale with black (not white or yellow) forehead. Voice. Song, from ground or in air, often consists of a few simple, rippling trills followed by short chatter, less fluent than that of many other larks; a second song is more like that of *Alauda arvensis* but less ebullient and less loud. Usual flight call "eeh" or "ééh-ti", or liquid "tur-reep"; occasional harsh "tsrr".
Habitat. The only lark to have successfully colonized tundra and alpine habitats; throughout range prefers mainly barren terrain with very short vegetation. In North America, where the only breeding representative of the family, widely distributed across most open habitats, occurring from sea-level to c. 4000 m and from tundra and mountains to steppe, desert and other bare ground, also wide variety of farmland types; shows a preference for recently burned sites; will also feed on sandy beaches and breed in sand dunes; highest densities occur where bare ground predominates, and in grassland and other grazed habitats most numerous in more heavily grazed areas. In Andes, race *peregrina* found in short-grass pastureland and bare fields, to at least 3100 m, probably higher. In Eurasia, breeds mainly in arctic tundra, dry stony patches in lichen tundra, barren steppes and arctic-alpine zones; breeds up to snow-line, to 5400 m in Himalayas. Also on open coasts and dunes in non-breeding season; in W Europe, migrants of race *flava* largely confined to open coastal habitats around North Sea in winter.
Food and Feeding. Wide range of invertebrates in summer and plant material in winter. Main invertebrate prey items are grasshoppers (Acrididae), beetles (Coleoptera), flies (Diptera) and lepidopteran larvae; nestlings fed almost entirely with these invertebrates, also with earthworms (Annelida). Seeds, especially small grass seeds, particularly important in winter, when may comprise entire diet; flocks wintering around North Sea coasts (W Europe) feed largely on energy-rich halophyte seeds found in lower saltmarshes. Forages on ground, singly or in small to large, tightly knit flocks; walks and runs. Obtains most food items directly from soil surface; occasionally digs, pursues flushed prey by running, and takes seeds directly from plants. Occasionally drinks water around dawn.
Breeding. In North America, season from mid-Feb in S USA (one of earliest nesters) and from mid-May in Canadian Arctic; in Eurasia, breeds from late May to mid-Jul in Scandinavia but from mid-Jun in arctic Russia; one brood in N of range, 2-3 broods in S. Apparently monogamous; territorial, breeding territory 0·3-5·1 ha depending on habitat. Song-flighting male ascends to great height, up to 250 m, hovers while singing, drops vertically back to earth; generally less aerial than many other larks. Nest, built by female alone, an excavated cavity or natural depression on ground, filled with woven plant material, lined with feathers or other fine material, with stones, bark, clods of earth, animal dung and other material placed around it; nest usually positioned in such a way as to reduce wind flow across it to as little as a tenth of ambient wind speed and to maximize shade. Clutch 1-8 eggs, mostly 2-5, clutch size increasing with increasing latitude; incubation by female alone, period 11-12 days; chicks fed by both parents, leave nest at c. 9-12 days, fly at 16-18 days, reach full adult size at c. 30 days. Success variable; at high altitudes in Asia, productivity in some years reduced to zero by severe cold; drought may also reduce productivity of populations at lower latitudes; nests often parasitized by Brown-headed Cowbird (*Molothrus ater*) in North America. Recorded longevity at least 8 years.
Movements. Migratory or partially migratory in N; mostly resident or altitudinal migrant in S. Across Holarctic Region, races in far N wholly migratory, with much or all of breeding range abandoned in winter (usually by late Oct, earlier in Russia): *arcticola* and *hoyti* migrate to W & N USA, nominate to SE USA, and *flava* to coasts of W Europe (S North Sea, W Baltic Sea), less regularly inland in C & E Europe, and in large numbers across C Asia (S to Sea of Azov, N Caucasus, N Kazakhstan and NE China); returning birds arrive as early as late Feb in S Canada, but not until Apr or early May in Alaska and N Canada, and in Eurasia from late Apr in W (N Norway) and from mid-May in extreme N Russia; males arrive back on breeding grounds before females. Several races are partial or altitudinal migrants in N of respective ranges, e.g. *strigata*, *praticola*, *enthymia* and *leucolaema* from S Canada move S after breeding, some reaching N Mexico, and those breeding in high mountains of Asia (e.g. *albigula*, *longirostris*) descend to lower elevations in winter. In addition, some populations of S USA deserts (*ammophila*, *occidentalis*) undertake short-distance movements to NW & N Mexico. Generally in flocks, usually of up to 50 individuals

On following pages: 78. Temminck's Lark (*Eremophila bilopha*); 79. Dunn's Lark (*Eremalauda dunni*); 80. Stark's Lark (*Spizocorys starki*); 81. Pink-billed Lark (*Spizocorys conirostris*); 82. Botha's Lark (*Spizocorys fringillaris*); 83. Obbia Lark (*Spizocorys obbiensis*); 84. Masked Lark (*Spizocorys personata*); 85. Sclater's Lark (*Spizocorys sclateri*); 86. Short-tailed Lark (*Pseudalaemon fremantlii*).

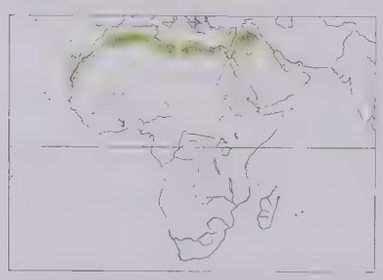
but sometimes to several hundred in hard weather, during migration and outside breeding season. Nominate race recorded as vagrant in UK and Bermuda; *flava* recorded annually in Japan.
Status and Conservation. Not globally threatened. Common to locally very common; scarce in some areas. Has one of the largest world ranges of any songbird, and is the only alaudid occurring naturally in the New World (apart from *Alauda arvensis*, which has recently gained a tenuous foothold in W Alaska). Across much of range, and particularly in North America and arctic Eurasia, one of the commonest bird species in a wide range of open habitats; spread of cultivation led to considerable range expansion in North America at end of 19th century and beginning of 20th century. Global population almost certainly very large, but few reliable data; estimates at end of 1990s include c. 6370-18,560 pairs in Europe (most in Norway), 10,000-100,000 pairs in Turkey and 100,000-1,000,000 pairs in Russia; fairly common in SE Europe, and density in Caucasus up to 4·5-6 birds/km²; locally common in Middle East and N Africa, and common in China. No figures for North America but widespread and common, probably several million pairs; fairly common to common in Mexico. Race *peregrina*, restricted to Altiplano Cundiboyacense, in Colombian Andes, is rare, and declining rapidly as a result mainly of spread of introduced Kenyan kikuyu grass (*Pennisetum clandestinum*), unfavourable agricultural practices and unrestricted use of pesticides; in 2002 total of 401 individuals located, and population estimated at fewer than 1000. Some North American races also have small ranges and populations, although trends across the continent appear stable. Declining in some areas, largely because of changes in agriculture; replacement of arable crops by biomass-fuel production, and of conventional tillage by minimum tillage, poses threats in some parts of North America, as does agricultural abandonment; direct poisoning by pesticides has also been recorded, and this species may be particularly susceptible to this risk as in some areas it is a significant pest of crops, and chemical repellents are used to reduce crop damage. Other populations are increasing; for example, deforestation for farmland or airstrips has allowed the species to colonize formerly forested regions across much of North America. In Europe, drastic declines noted since 1950s in N Fennoscandia, especially Finland, believed possibly due to overgrazing of lichen by reindeer (*Rangifer tarandus*), but increase and range extension recorded in Balkans; expansion in area of coastal marshes in Netherlands as a result of improved flood defences led to increase in numbers of this species wintering there.
Bibliography. Adamian & Klem (1999), Ali & Ripley (1987), Anon. (1998a, 2003b), Apa *et al.* (1991), Ballman (1972), Beason (1970, 1984, 1995), Beason & Franks (1973, 1974), Behle (1942), Bent (1942), Bock & Bock (1992), Bock & Webb (1984), Boutin *et al.* (1999), Boyd (1976), Brazil (1991), Brazil & Cook (1991), Brodkorb (1978), Brown & Atkinson (1996), Brugiere (1988), Cadena (2002b), Campbell, Dawe *et al.* (1997), Cannings (1981), Cannings & Threlfall (1981), Castralle (1982, 1983), Chandler & Martin (1988), Clark & Karr (1979), Cramp (1988), Crutchfield (1985), DeGraaf & Rappole (1995), Dementiev *et al.* (1970), Deng Heli & Zhang Xiaoai (1991), Deng Heli *et al.* (1991b), Dickerman (1964), Dickinson & Dekker (2001a), Dierschke (2001, 2002a, 2002b), Dierschke & Bairlein (2002), Drury (1961), DuBois (1935, 1936), Dwight (1890), Ehrich (1997), Emslie (1985), Garner (1999), George *et al.* (1992), Godlinsky (1996a), Gorski (1982), Grimmett *et al.* (1998), Grzybowski (1976, 1983a, 1983b), Hagemeijer & Blair (1997), Hartman & Oring (2003), Heath *et al.* (2000), Heim de Balsac (1936), Hellmayr (1935), Hildén (1987), Hilty & Brown (1986), Hofer (1983), Howell & Webb (1995a), Hsu Weishu (1988), Hüe & Étchécopar (1970), Hurley & Franks (1976), Igl & Johnson (1997), Ilani & Shalmon (1984), Inskipp & Inskipp (1991), Kaufman (1996), Klimkiewicz & Futcher (1989), Lobachev & Kapitonov (1968), Mackinnon *et al.* (2003), Maher (1979, 1980), Martin & Forsyth (2003), McAtee (1905), McNicholl (1988), Meinertzhagen (1954b), Michelat (1998), Mishra (2000), Mousley (1916), Munteanu & Szabó (2001), Murray *et al.* (2003), Nelson & Martin (1999), Niles (1972c, 1973), Norvelle & Creighton (1990), Olafsson (1983), Parmalee & Klippel (1982), Patterson & Best (1996), Pätzold (1979, 1981, 1987, 1991), Peck & James (1987), Petersen & Best (1987), Pickwell (1931), Pittaway (1994), Plucinski (1987a, 1987b), Price *et al.* (1995), Reynolds & Shorey (1984), Ridgely & Tudor (1989), Ripley (1982), Roberts (1992), Root (1988), Rotenberry & Wiens (1976), Rousset (1998), Rust (2003), Ryabitsev & Tyulkin (1985), Sáez-Royuela (1952), Schlogel (1989), Shirihai (1996), Small (2002), Snow & Perrins (1998), Spjøtvoll (1970), Stepanyan (1990), Stotz *et al.* (1996), Sutter *et al.* (2000), Sutton (1927), Sutton & Parmelee (1955), Svensson (1990, 1997), Svensson & Berglund (1995), Svensson *et al.* (1992), Swain (1989, 1991, 1992a, 1992b), Thévenot *et al.* (2003), Thiede (1989), Trilar (1999), Trost (1972), Vaurie (1959), Verbeek (1967), Whistler (1932), Whitmore (1980), Wiens & Rotenberry (1979, 1980, 1985), Wiens *et al.* (1986, 1987), Wing (1946), With & Webb (1993), York *et al.* (2000), Zhao Liang *et al.* (2002), Zheng Shengwu (1984).

78. **Temminck's Lark**

Eremophila bilopha

French: Alouette bilophe **German**: Saharaohrenlerche **Spanish**: Alondra Sahariana
Other common names: Temminck's Horned Lark

Taxonomy. *Alauda bilopha* Temminck, 1823, deserts of Aqaba, north-west Arabia.
Genus distinct in plumage and structure, particularly bill structure; probably closest, although still distantly related, to *Alauda* and *Galerida*. Forms a superspecies with *E. alpestris*, formerly considered conspecific. Smaller birds from S Western Sahara (Río de Oro) described as race *elegans*, but similarly small birds occur elsewhere in species' range (e.g. Libya and W Egypt). Monotypic.
Distribution. Extreme NW Mauritania, Western Sahara and S & E Morocco E to NE Egypt (Sinai Peninsula) and Middle East (Syria, Jordan, S Israel, W Iraq, N Saudi Arabia, Kuwait).



Descriptive notes. 13-15 cm; c. 38-39 g. Small, neat, uniform-looking lark with striking head pattern, rather thin bill, rather short and broad wings with short primary projection, narrow pointed outer primary reduced (9-13 mm short of tips of primary coverts), straight hind claw (5·5-8·2 mm). Male has white face with contrasting black on lower part of forehead, lores and from eye down to cheek, black forecrown with elongated lateral feathers ("horns"), black chestband; central crown to nape and rear ear-coverts sandy rufous, nape often washed pinkish, upperparts sandy rufous with slight mottling (visible at close range), upperwing-coverts and tertials reddish with pale edgings, primary tips contrastingly blackish; tail black, central rectrices rufous, outer ones white; underparts whitish, sides washed rufous-buff; bill greyish; legs flesh-grey to bluish-grey. Female is very like male, but black areas of face and chest slightly less well defined, "horns" shorter. Juvenile is very different, lacks black-and-white pattern on face and chest, has faint white spots on upperparts, longer outer primary (5-6 mm short of primary coverts) is broader with more rounded tip. Voice. Song, in flight or, perhaps more commonly, from ground, a series of soft, usually short, rather monotonous twittering and warbling phrases with short whistles, e.g. "dee dee-eeee" or "chep-chep-chew-eeee", very like that of *E. alpestris* but quieter, less vigorous, with finer notes. Calls include quite loud "tsip" or "sweeep", like that of a wagtail (*Motacilla*).

Habitat. Open flat plains, mainly on fringe of true desert, also in completely barren landscapes; usually on stony or compacted soils, avoiding soft sand. In N Africa occurs in steppe areas and high plateaux with annual rainfall 200-250 mm, mostly with wormwood (*Artemisia*) shrubs or *Stipa* or *Lygeum* grasses, also slopes with low-growing patches of the succulent *Aizoon*. Mainly lowlands, to 1000 m in N Africa.
Food and Feeding. Predominantly seeds; occasionally insects, e.g. beetles (Coleoptera), some fruits; nestling diet not known. In NW Africa seeds, mainly those of *Aizoon* in spring and summer. Forages on ground, in pairs or in small groups; often in loose association with other alaudids. Runs nervously, then slowly, pecking seeds from ground surface; also uses bill to displace and turn over stones, including those heavier than the bird itself.
Breeding. Lays Feb-May, mostly from mid-Apr; apparently single-brooded. Probably monogamous; solitary and territorial, inter-nest distance in S Israel usually large (few hundred metres to several kilometres). Male song flight very brief, rising to c. 20-25 m, hovering while singing, dropping vertically back to ground. Nest a shallow scrape lined with grass, rootlets and small twigs, topped with soft grass-heads, internal diameter 7 cm, on ground in the open or beside a shrub, with rampart of small stones. Clutch 2-4 eggs (mode 3); incubation 13-14 days; chicks cared for and fed by both parents, leave nest at 10-12 days, able to fly a few days later, at 15-16 days. Possible interspecific nest parasitism recorded; a pair observed to feed chicks of *Calandrella rufescens*.
Movements. Resident, with limited dispersive movements. Dispersal somewhat irregular, little known. In N Africa moves short distances in flocks of c. 20 birds, probably more on occasion. Apparently more regular movement in E of range; large winter flocks, sometimes mixed with other larks, observed S of breeding range in Saudi Arabia; mostly a breeding visitor (Feb-Nov) in S Israel, where observations indicate also small seasonal passage movements S in Oct-Nov and, especially, N in Mar-May (usually flocks of up to 40 individuals, highest total 1340 birds during Mar-Apr 1989). Vagrants recorded in Lebanon and S Arabia (Yemen, United Arab Emirates), also in Malta, possibly also Spain (19th-century report); also in Gambia in 2002.
Status and Conservation. Not globally threatened. Common to fairly common in most of range; scarce in some areas. In comparison with other Saharan larks, has fairly continuous distribution but limited to N parts of that region, and not extending far into Asia. In N African range, locally abundant in Western Sahara (Ugranat plains, where up to 560 birds in 21-km vehicle transect) and Morocco (Hauts Plateaux), frequent and widespread in Algeria (50 birds in 16-km transect in Laghuat), and scarce in Tunisia (but frequent Chott Rharsa); widespread in NW Libya (Tripolitania) and fairly common in Egypt (locally common along N coast from border E to Nile Delta, local in Sinai). In Middle East, common in Jordan (third commonest lark in Azraq area, very common at Shaumari) and in W deserts of Iraq; locally common in Tadmur (Palmyra) area of Syria and in C deserts of N Saudi Arabia; scarce and local in Kuwait; local, and scarce to uncommon, in Israel, with possibly no more than a few tens of pairs remaining following marked decline in 1980s, believed due mainly to loss of habitat.
Bibliography. Blondel (1962), Brosset (1956, 1961), Bundy (1976), Bundy & Warr (1980), Clarke (1980), Cowan & Brown (2001), Cramp (1988), Crewe & Small (2002), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dupuy (1969), Étchécopar & Hüe (1964), Gee (1984), Goodman & Ames (1983), Goodman *et al.* (1989), Haas (1969), Heard & Kirwan (1997), van Heezik & Seddon (1999), Heim de Balsac (1936), Heim de Balsac & Mayaud (1962), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Isenmann & Moali (2000), Jennings (1980b, 1981, 1995), Keith *et al.* (1992), Ledant *et al.* (1981), Mayaud (1985), Meinertzhagen (1951, 1954a), de Naurois (1989), Nelson (1973), Ramadan-Jaradi & Ramadan-Jaradi (1999), Richardson (1990), Schmutterer (1969), Schönwetter (1979), Shannon (1974), Shirihai (1996), Smith (1965), Snow & Perrins (1998), Stanford (1954), Sultana & Gauci (1982), Svensson *et al.* (1999), Taylor (1992), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Valverde (1957), Vaurie (1959), Wallace (1983, 1984).

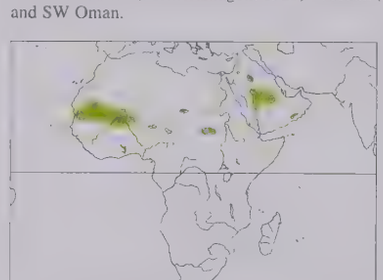
Genus *EREMALAUDA* W. L. Sclater, 1926

79. **Dunn's Lark**

Eremalauda dunni

French: Alouette de Dunn **German**: Einödlerche **Spanish**: Alondra de Dunn

Taxonomy. *Calendula dunni* Shelley, 1904, Ogageh Wells, Kordofan, Sudan.
Sometimes placed in genus *Ammomanes*, and has been considered by some to be close to *Ammomanopsis grayi*, but appears distinct. Two subspecies recognized.
Subspecies and Distribution.
E. d. dunni (Shelley, 1904) - S edge of Sahara in Mauritania, N & C Mali, S Niger, N Chad and C Sudan.
E. d. eremodites (Meinertzhagen, 1923) - Jordan (Azraq), S Israel (sporadic), N & C Saudi Arabia and SW Oman.



Descriptive notes. 14-15 cm. Small but relatively bulky lark with sand-coloured plumage, strong facial pattern, heavy deep-based bill quite large (around half of head length), strongly curved on culmen, broad and rounded wings with long tertials, very short primary projection, reduced outer primary (0-4 mm short of tips of primary coverts), short tail; hind claw short (6·6-8 mm) and curved. Nominate race has broad whitish eyering and short supercilium, latter more evident in front of eye, thin dark moustachial and malar stripes; pinkish-tinged to orange-tinged sandy brown above, crown to mantle lightly streaked red-brown (streaks most distinct when plumage worn), wings rather pale and uniform, blackish tips of outer primaries; tail buff centrally, black sides, outer edge of outer rectrix white (tail pattern striking in flight); whitish below, breast washed sandy, breast side faintly streaked red-brown; bill pale-coloured, pinkish to orange; legs pinkish. Sexes similar. Juvenile has white spots on tips of crown, mantle and scapular feathers, lacks black on tips of primaries, has outer primary longer and with more rounded tip than that of adult. Race *eremodites* is larger and longer-billed than nominate, also less pinkish, with fewer streaks dark brown (less reddish), more obvious black primary tips. Voice. Male song, from ground or low perch, a rapid repetition of chirping and dry notes mixed with whistles, e.g. "wit-wit-wtrrreedritdritdridrree", or in flight and then sometimes more varied and

rattling, scratchy warbling with interposed short whistled phrases. Flight call "ziup", "chiup-chiup", "two-weep"; also thin "prrrp" or "chrruit"; alarm call on rising a loud "chhe-oop" or "chup-chup-chup". Repeated high, plaintive "pee-pee" or "peeuw-peeuw-peeuw" by fledglings.
Habitat. Open arid lowlands, flat or undulating, and with gravel or compacted sandy soils; avoids broken ground, rocky slopes and soft sandy substrates. In deserts, prefers wadis with sparse dry herbaceous cover. Also in flat stony desert in non-breeding season.
Food and Feeding. Few data. Diet mainly small seeds (*Panicum turgidum* and others), but stomach of one individual from Mali contained insects. Chicks fed with caterpillars in Saudi Arabia. Forages on ground, singly or in pairs, also in small flocks outside breeding season. Searches ground surface, alternately running nervously and pausing; also digs for seeds with the bill, and rummages in low vegetation.
Breeding. Poorly known. Season determined by rainfall; nesting recorded in Jan, after rains, in Mauritania; laying in Apr in Israel; single-brooded. Solitary, territorial. Song-flighting male rises to c. 30 m, occasionally 50 m or more, hovers with slow wingbeats, swinging from side to side, slowly parachutes back to ground. Nest a scrape on ground, under or beside a tussock or small shrub, lined with fresh vegetation; roles of sexes in building unknown. Clutch 2-3 eggs; incubation by both sexes, mainly female, period 13-16 days; chicks fed by both sexes, leave nest at c. 10 days, able to fly 3-6 days later.
Movements. Resident; some nomadic movements occur, probably related to drought conditions. Wanders in usually small flocks of up to 20 individuals, sometimes mixed with other alaudids. Periodic irruptions into areas outside normal range; in Nov 1988, following exceptional rainfall in preceding winter, hundreds appeared in desert areas of Arava Valley, on S Israel-Jordan border, some remaining to nest. Accidental in Lebanon, Kuwait, Yemen and United Arab Emirates.
Status and Conservation. Not globally threatened. Status difficult to assess; generally uncommon and irregular in most of fragmented range, but possibly under-recorded owing to identification problems and/or nomadic habits. Reported as widespread but irregular, and common to uncommon, in Mauritania (breeding confirmed at Zemmour in 1970), locally common from Mali E to Chad, and uncommon in Sudan; others report it as uncommon to rare in African range. Presence in S Western Sahara and S Algeria suspected, but not proven. Race *eremodites* common in N Saudi Arabia, but uncommon in other areas of this country, and rather scarce and local in Oman; irregular in Jordan (breeding first confirmed 1965), and sporadic in Israel (first breeding 1989); irregular in NE Egypt (NE Sinai Peninsula), nested in 1990.
Bibliography. Baha-El-Din (1990), Bannerman (1953), Brooks, D.J. *et al.* (1987), Bundy & Warr (1980), Castell *et al.* (2002), Cave & Macdonald (1955), Cowan & Brown (2001), Cramp (1988), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Étchécopar & Hüe (1964), Gallagher & Woodcock (1980), Goodman *et al.* (1989), Harrison (1962), Heard & Kirwan (1997), van Heezik & Seddon (1999), Heim de Balsac & Mayaud (1962), Hollom *et al.* (1988), Isenmann & Moali (2000), Jennings (1980b, 1981, 1995), Keith *et al.* (1992), Lamarche (1981), Ledant *et al.* (1981), Lees-Smith (1986), Lunais (1983), Mackworth-Praed & Grant (1960, 1970), Mayaud (1985), Meinertzhagen (1951, 1954a), de Naurois (1974), Newton & Newton (1997), Niethammer (1963a), Nikolaus (1987), Pilcher *et al.* (1990), Rietkerk & Wacher (1996), Round & Walsh (1981), Shirihai (1991a, 1991b, 1994, 1996), Shirihai *et al.* (1990), Snow & Perrins (1998), Svensson *et al.* (1999), Ter Haar (1981), Tieleman (2002), Tieleman & Williams (2002a), Tieleman, Williams & Buschur (2002), Tieleman, Williams, Buschur & Brown (2003), Vaurie (1959), Walker (1981b), Wallace (1983).

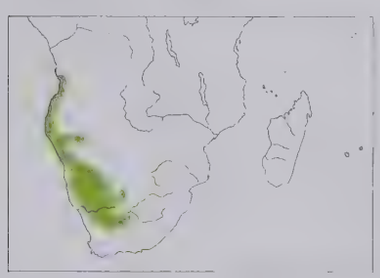
Genus *SPIZOCORYS* Sundevall, 1872

80. Stark's Lark

Spizocorys starki

French: Alouette de Stark **German**: Falblerche **Spanish**: Alondra de Stark
Other common names: Stark's Short-toed Lark

Taxonomy. *Calandrella starki* Shelley, 1902, Wilsonfontein, Damaraland, Namibia.
Sometimes placed in genus *Eremalauda*, but genetic evidence suggests that it falls within clade formed by members of present genus. Birds from C Namibia S to NW South Africa sometimes separated as race *gregaria*, but generally considered indistinguishable from those in rest of species' range. Monotypic.
Distribution. Angolan coastal plain (S from Porto Amboim, in Cuanza Sul), Namibia, SW Botswana and NW South Africa.



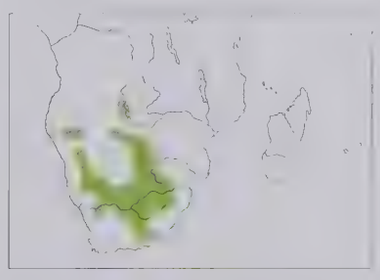
Descriptive notes. 13-14 cm; 16-22 g. Fairly small, very pale lark with erectile crest which, even when not raised, tends to make head appear slightly peaked; stout bill rather heavy along much of its length. Has pale face, appearing washed out, with whitish supercilium contrasting only slightly with buff-brown ear-coverts, faint darker T-shaped mark under eye (visible only at close range); pale to very pale sand-brown above, darker brown feather centres forming indistinct streaks, these most prominent on crown; wing-coverts dark brown with broad buffy margins, median coverts often show as row of darker spots; flight-feathers and tail darker brown with buffy margins, especially on inner secondaries, tertials and central tail feathers, outer rectrices broadly edged white; underparts white, buffy wash and a few darker brown streaks on breast; eyes brown, bill whitish horn-coloured, tip darker; legs pale flesh. Distinguished from *S. conirostris* by slightly larger size, paler and less brown upperparts, much longer, paler bill; from *S. sclateri* by paler plumage above and below, somewhat shorter and less heavy bill. Sexes alike. Juvenile has white tips and darker subterminal bars on upperpart feathers, appearing slightly darker and more spotted, breast diffusely spotted. Voice. Male song, in flight, a long, rambling series of rather unmelodic chirps and trills, with occasional sweeter whistles, most phrases repeated 3-5 times before switching to new phrase. Soft "chipping" call in flight or when flushed; "tree" call when nest approached by intruder; soft "chop chop" feeding call to nestlings.
Habitat. Arid and semi-arid grassy plains, usually preferring gravels and hard limestone to sands. Often occurs in areas with some shrubs or scattered trees.
Food and Feeding. Seeds, insects and green vegetable matter. In one study in C Namib Desert, seeds made up 77% of diet, with insects 19% and green vegetable matter 4%; seeds were mostly those of grasses, with some forbs, and insects were mostly termites (of genus *Hodotermes*) and ants, with smaller numbers of beetles (Coleoptera), bugs (Hemiptera), flies (Diptera), solifugids and spiders. Unusually, chicks, even from hatching, fed mostly with green seeds. Forages on the ground, singly or in small flocks of up to ten birds; occasionally in aggregations of hundreds or thousands, often mixed with *Eremopterix verticalis* and Lark-like Buntings (*Emberiza impetuani*). Creeps along, picking prey from surface, or digs with its bill; also pulls at grass stems to expose succulent bases, which are then eaten. Seeks shade in heat of day, or sometimes reduces heat stress by standing with wings drooped, facing into wind, on elevated perch. Regularly drinks water, especially in hot, dry weather, but some flocks apparently survive without access to water in C Namib. Metabolic rate typical for a bird of its size, but rate of evaporative water loss significantly lower than expected, also significantly lower among birds deprived of water. Some individuals maintained constant weight on a diet solely of dry millet seeds or with only 0·3 M salt solution to drink; water-deprived birds produced faecal pellets containing 52% water.
Breeding. Breeds opportunistically after rains, mostly Mar-May, but can occur at any time; typically starts 4-8 weeks after rain events, thus somewhat later than other nomadic species in its range, e.g. *Eremopterix australis* and *E. verticalis* and Lark-like Bunting, possibly because of nestling diet (seeds); in N & NW Karoo, abundance of *Stipagrostis* awns (used for nest-lining) may be indicator of suitable breeding conditions. Monogamous; nests singly, but often at fairly high densities when conditions favourable. Male performs protracted aerial display, rising steeply 50-100 m and singing continuously while circling or flying slowly into wind, usually ending by dropping straight down to ground, often to chase another bird; on ground, approaches female with raised crest and wings slightly drooped, bobbing its head and singing continuously. Nest in shallow scrape on ground, usually at base of a grass tuft, other plant or rock, typically on S or E side for shelter from afternoon sun, those in winter often more exposed, cup mostly lined with grass awns, rim adorned with pebbles, soil clods and occasionally sand-encrusted spider webs. Clutch 2-4 eggs (mean 2·7); incubation by both sexes, period 11-13 days; chicks well camouflaged by having long, silky down that matches feathery grass awns of nest-lining, brooded and fed by both parents; when nest approached, parents flutter erratically over intruder, calling and sometimes snapping the wings, frequently landing and taking off again, if intruder persists they may feign injury by fluttering away along ground; chicks leave nest at c. 10 days, before able to fly. Of 12 eggs in six nests in Kalahari, only four hatched and no chicks fledged.
Movements. Nomadic; large flocks follow rain events.
Status and Conservation. Not globally threatened. Common to locally abundant in its core range, but occurrence erratic towards periphery. Densities difficult to assess because of nomadic behaviour; 5-12 birds/ha in C Namib when conditions favourable. Foraging flocks sometimes very large, containing several thousands of individuals. Significant numbers occur in protected areas in Namibia and Kalahari; given the species' wide-ranging movements, however, this fact is considered insufficient to ensure its conservation.
Bibliography. Brewster (1998), Dean (1997, 2000), Demey (2004a, 2004c), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Keith *et al.* (1992), Lloyd (1999), Mackworth-Praed & Grant (1962), Maclean (1970a, 1970b, 1993a), Sinclair & Hockey (1996), Sinclair & Ryan (2003), Tarboton (2001), Willoughby (1968, 1971).

81. Pink-billed Lark

Spizocorys conirostris

French: Alouette à bec rose **German**: Rotschnabellerche **Spanish**: Alondra Piquirrosa

Taxonomy. *Alauda conirostris* Sundevall, 1850, Vetchkop, Free State, South Africa.
Has been thought to form a superspecies with *S. sclateri*, but usually considered closer to *S. fringillaris*. Geographical variation broadly clinal; several races possibly not sustainable. Birds from far S of range named as race *transiens* and others from NE South Africa as *griseovinacea*, both regarded as indistinguishable from nominate. Six subspecies recognized.
Subspecies and Distribution.
S. c. makawai (Traylor, 1962) - W Zambia (Liuwa and Mutala Plains).
S. c. harti (Benson, 1964) - SW Zambia (Matabele Plain).
S. c. damarensis Roberts, 1922 - N Namibia and NW Botswana.
S. c. crypta (Irwin, 1957) - NE Botswana (Makgadikgadi Pan and L Dow).
S. c. barlowi Roberts, 1942 - S Namibia, S Botswana and NW South Africa (Northern Cape).
S. c. conirostris (Sundevall, 1850) - South Africa (Northwest Province E to Mpumulanga and W KwaZulu-Natal, S to Free State and Eastern Cape) and NW Lesotho.



Descriptive notes. 12-13 cm; 12-17 g. Fairly small, compact lark with short, stout, pinkish bill. Nominate race has broad buffy to whitish supercilium, contrasting dark eyestripe and streaked brown crown; upperparts brown to rufous-brown with darker feather centres, plainer on rump and uppertail-coverts; upperwing-coverts dark brown with broad buffy margins, median coverts often appearing as row of dark spots on folded wing; flight-feathers dull brown with buff margins, latter broader on inner secondaries and tertials; tail dark brown, buff margins of outer feathers; throat whitish, rest of underparts rufous-buff, breastband of dark brown streaking; eyes pale brown; bill dull pink; legs pink. Differs from *S. fringillaris* in bolder supercilium, warmer-coloured upperparts, less pale in outer tail, darker underparts, thicker bill. Sexes alike. Juvenile is darker above, appearing spotted owing to pale feather tips, breast with diffuse dark spots, bill duller with blackish tip. Races vary chiefly in coloration, paler and less streaked in arid W, more rufous in SE, greyer or blackish above in N: *barlowi* is paler than nominate, less streaked above, belly whitish; *damarensis* is paler and less streaked than previous; *crypta* has greyer upperparts; *makawai* is blackish-brown with pinkish-buff edgings above, light pinkish-chestnut below; *harti* resembles previous but paler, with upperparts feathers edged pale grey. Voice. Flight call a dry, trilled "chree chree", higher-pitched than that of *Calandrella cinerea*; male song a mix of call notes and short, sweeter, whistled elements, often repeating each note 3-4 times.
Habitat. Ranges from moist submontane grassland to semi-arid Nama Karoo and Kalahari grassland and savanna. In E occupies pastures and fields with young cereal crops, as well as recently ploughed and fallow fields. Largely restricted to red sands in the Kalahari, where prefers well-grassed dunes but also occurs in *Rhigozum* scrub provided that sufficient cover present. Often found around pans or on floodplains with short grass in N Botswana and SW Zambia.
Food and Feeding. Mostly seeds, some insects. Forages on the ground, singly or in pairs; in small flocks outside breeding season. Walks with bent legs, inspects ground surface. Regularly drinks water.

Breeding. Mostly Nov-Jun, in association with summer rains, generally later in NW (where onset of rains delayed); in arid W breeding opportunistic, linked to rainfall, can take place at any time of year. Monogamous; nests solitarily, when conditions favourable also in loose aggregations. Male has fairly short aerial display. Nest a shallow scrape in soft, sandy soil, usually at base of a grass tuft, occasionally of another plant, lined with cup of grass and rootlets, sometimes built on foundation of sticks, in bare sandy areas open side typically with broad "apron" of nest material; usually facing S or E, but some nests in winter are in exposed sites. Clutch 2 eggs, rarely 3 (mean 2·1); incubation starts immediately after first egg laid, lasts 11-13 days, usually 12 days; chicks fed by both parents, leave nest at c. 10 days, before able to fly. In the Kalahari, crude breeding success was 15% (48% of eggs hatched, 31% of chicks fledged).
Movements. Nomadic in arid W, following rain events with other granivorous species. Largely resident or subject to local movements elsewhere in range. Localized population in NE assumed to be entirely sedentary.
Status and Conservation. Not globally threatened. Locally common in S, becoming more sporadic in N. Non-breeding flocks small. Lives in transformed habitats as well as natural ones.
Bibliography. Benson *et al.* (1971), Clancey (1964b, 1972), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Herholdt & Grobler (1987), Keith *et al.* (1992), Lloyd (1998), Mackworth-Praed & Grant (1962), Maclean (1970a, 1970b, 1993a), Penry (1994), Sinclair & Hockey (1996), Sinclair & Ryan (2003), Tarboton (2001).

82. Botha's Lark

Spizocorys fringillaris

French: Alouette de Botha **German**: Finkenlerche **Spanish**: Alondra de Botha

Taxonomy. *Alauda fringillaris* Sundevall, 1850, Leeuspruit, Vredevort, Free State, South Africa. Sometimes placed in a monotypic genus *Botha*, but such treatment unwarranted. Usually considered closely related to *S. conirostris*. Monotypic.
Distribution. E Free State and Mpumulanga, in NE South Africa.



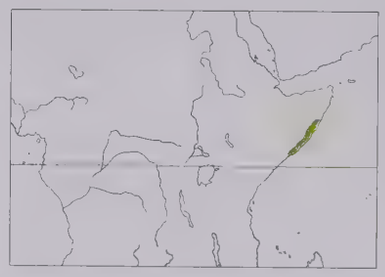
Descriptive notes. 13-14 cm; 16-21 g. Fairly small, compact lark with heavily dark-streaked upperparts. Has creamy or buffy supercilium, dark eyestripe, pale brown ear-coverts lightly mottled darker; upperparts grey-brown, heavily streaked blackish-brown; flight-feathers and upperwing-coverts dark brown with narrow buff margins; tail dark brown, outer two feathers with broad white edges; whitish below, breast and flanks washed rufous-buff, small dark brown streaks on breast; eyes brown; bill orange-pink, slightly darker tip; legs pink. Differs from *S. conirostris* in slightly larger size, narrower supercilium, colder upperparts, paler underparts, white (not buffy) tail side, smaller and less pink bill. Sexes alike. Juvenile is darker with buff feather fringes above, appearing spotted or scaled, bill horn-coloured. Voice. Male song, from ground or in flight, a rather dry "tchiree" or "teez-rrr". Flight call soft "tirrup tirrup" or "chuk", often in chorus by a flock; similar call also given on ground by flock-members prior to flushing.
Habitat. Short upland grassland, usually on clay soils. Favours well-drained, heavily grazed areas with occasional bare patches; often found near cattle pens and other trampled areas. Avoids tall grassland, fields, rocky areas and poorly drained sites.
Food and Feeding. Seeds and insects; all identifiable prey delivered to chicks were small insects, including beetles (Coleoptera) and moths (Lepidoptera). Forages singly or in pairs; in small flocks outside breeding season. Picks prey from ground or from grass; not seen to dig for food. Occasionally hawks aerial insects. Drinks regularly; apparently dependent on water sources, especially in hot, dry weather.
Breeding. Nov-Jan. Monogamous; nests solitarily, although inter-nest distance sometimes less than 50 m. Male aerial display, with slightly exaggerated wingbeats, 10-20 m above ground. Nest an open cup, lined with grass, sometimes with wool or hair, in shallow scrape on ground, usually between a couple of short grass tufts but completely open above; one nest was in a pile of sheep dung. Clutch 2 eggs, rarely 3 (mean 2·1); incubation by both adults, in relatively short bouts with frequent change-overs, duration not known; chicks brooded and fed by both parents, a single large chick was fed 11 times in 30 minutes, adults foraging mostly within 50 m of nest but also ranging more than 200 m, beyond other nests, without any aggressive interactions with other pairs; fledging period not known. Crude breeding success 53% (of 17 eggs in eight nests, nine survived).
Movements. Resident; local movement in response to fires.
Status and Conservation. ENDANGERED. Restricted-range species: present in South African Grasslands EBA. Maximum range covers c. 43,000 km², within which it is thinly distributed and patchy; recorded densities of up to 6 pairs/ha; in small flocks of 5-10 birds when not breeding. Global population estimated at 1500-5000 individuals, all on privately owned land, and assumed to be decreasing. Much of its habitat has been transformed by agriculture. Establishment of a Grassland Biosphere Reserve centred on Wakkerstroom, in Mpumulanga, would encompass a significant number of birds, but progress towards this goal has been slow. Conservation targets include research designed to gain better understanding of factors determining the species' distribution, and assessment of its sensitivity to different grassland-management practices, such as use of fire and different levels of grazing intensity.
Bibliography. Allan *et al.* (1983), Barnes (2000), Brooke (1984b), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Evans, S.W. (1999b), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Herholdt & Grobler (1987, 1988), Keith *et al.* (1992), Mackworth-Praed & Grant (1962), Maclean (1993a), Sinclair & Hockey (1996), Stattersfield & Capper (2000), Tarboton (2001), Vernon (1973).

83. Obbia Lark

Spizocorys obbiensis

French: Alouette d'Obbia **German**: Obbialerche **Spanish**: Alondra de Obbia

Taxonomy. *Spizocorys obbiensis* Witherby, 1905, Obbia, Somalia.
Monotypic.
Distribution. Coastal plain of C Somalia (from 50 km S of Jirriiban S to Halhambe).
Descriptive notes. 12 cm; 12-16 g. Small, compact lark with rather stout bill; crouched feeding posture, recalling a canary (*Serinus*) or other finch. Has prominent whitish supercilium (often not reaching bill anteriorly, also sometimes interrupted by eye), dark eyestripe, dark moustachial and malar stripes; small pale spot on forehead immediately above bill on some individuals; crown and upperparts brown, variably streaked darker brown; central tail brown, matching upperparts, rest of tail dark blackish-brown, outer feathers sometimes with narrow white edge; whitish below, regular blackish streaks on breast and flanks; eyes brown; bill mostly brown, paler yellow base; legs dull flesh-brown. Sexes alike. Juvenile undescribed. Voice. Flight call "tip-tip"; song unknown.



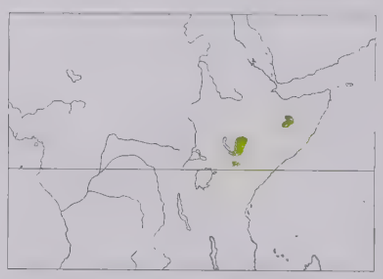
Habitat. Vegetated coastal dunes, also open coastal plain with heavily grazed grass and scrub farther inland; extends up to 40 km inland in N, to only 1 km in S.
Food and Feeding. Diet unknown; probably consists largely of seeds. Feeds on the ground, in typical crouched posture; also creeps over low mats of vegetation, in manner atypical for a lark.
Breeding. May-Jul and Nov-Dec in years with sufficent rainfall. Nest an open cup, variably lined with vegetation, fluffy seeds and even pieces of woolly string, in shallow scrape in sand at base of a plant, often on S or E side (providing little shade), or partly concealed under thin cover of creeping vegetation; few nests found have been close to the sea (of six sites detailed, four were within 50 m of high-water line). Clutch 2-3 eggs (mean 2·2); no information on parental duties or incubation and fledging periods.
Movements. Unknown. Possibly resident, but often occurs in flocks of up to 30 birds, even during breeding season; may be subject to local movements within its small range.
Status and Conservation. Not globally threatened. Data-deficient. Restricted-range species: present in Central Somali Coast EBA. No recent information on the species' status; was the most abundant passerine in coastal dunes in late 1970s. Largely dependent on vegetated dunes; some concern that increasing grazing pressure, coupled with demand for firewood, will lead to destabilization of its dune habitat, especially around Mogadishu. As its range extends over minimum of 570 km from N to S, it is likely to be still secure in at least some areas.
Bibliography. Ash (1981), Ash & Miskell (1998), Collar & Stuart (1985), Collar & Violani (1984), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Mackworth-Praed & Grant (1960), Sinclair & Ryan (2003), Stattersfield & Capper (2000).

84. Masked Lark

Spizocorys personata

French: Alouette masquée **German**: Maskenlerche **Spanish**: Alondra Enmascarada

Taxonomy. *Spizocorys personata* Sharpe, 1895, Sassabana, Milmil, Ogaden, Ethiopia.
Four subspecies recognized.
Subspecies and Distribution.
S. p. personata Sharpe, 1895 - E Ethiopia.
S. p. yavelloensis (Benson, 1947) - S Ethiopia and N Kenya (S to Dida Galgalu Desert).
S. p. mcchesneyi (Williams, 1957) - Marsabit Plateau, in N Kenya.
S. p. intensa (Rothschild, 1931) - C Kenya.



Descriptive notes. 15 cm; 20 g. Smallish, dark lark with heavy, pinkish bill, distinctive black facial markings. Nominate race has black mask from base of bill to area around eye and extending down into broad malar band, latter with white central patch, and accentuated by pale anterior ear-coverts; crown and upperparts grey-brown with blackish central feather streaks, rump plainer, upperwing-coverts and tertials dark brown with broad cinnamon margins; flight-feathers and tail brown, outer rectrices broadly edged buff-cinnamon; throat white, breast greyish-brown, shading to rufous-brown on belly, buff undertail-coverts; eyes brown; bill pale pink or yellowish-horn; legs pale pink. Sexes alike. Juvenile undescribed. Races vary in coloration: *yavelloensis* is darker and greyer above, dark greyish breast contrasting more with rufous belly; *mcchesneyi* has browner upperparts darker than nominate; *intensa* is rich brown above, darker below, belly deeper reddish. Voice. Call, given on ground or in flight, described as rolling "chew-chi chew, chew", "tew tew tutew tew" or shorter "chew" or "chew-chew"; also high-pitched "treeeee" and repeated "tee tee tee".
Habitat. Arid plains on black or red lava and black-cotton soils. Prefers areas with little shrub or grass cover, but apparently avoids road edges. At 400-1600 m.
Food and Feeding. Grass seeds, bulbs and corms; also some insects, including grasshopper (Acrididae) egg cases. Feeds on the ground; presumably used heavy bill to dig for bulbs and corms. Often stands erect on rocks, possibly to reduce heat stress.
Breeding. One specimen with well-developed egg in oviduct in Jul. No other information.
Movements. Poorly known; presumably resident and locally nomadic.
Status and Conservation. Not globally threatened. Locally common. Poorly known species; fieldwork required in order to ascertain details of breeding biology and ecology. Occurs in several protected areas, including Shaba Game Reserve, in C Kenya.
Bibliography. Bennun & Njoroge (1999), Benson (1946a), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

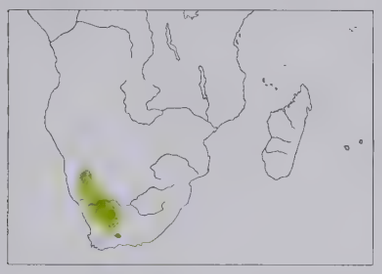
85. Sclater's Lark

Spizocorys sclateri

French: Alouette de Sclater **German**: Ammernlerche **Spanish**: Alondra de Sclater
Other common names: Sclater's Short-toed Lark

Taxonomy. *Calandrella sclateri* Shelley, 1902, Hauntop River, Maltahöhe, Namibia.
Has been thought to form a superspecies with *S. conirostris*. In South Africa, birds from Bushmanland (c. 40 km E of Pofadder) described as race *theresae* and others from SE as *capensis*, but both regarded as inadequately differentiated. Best treated as monotypic.

Distribution. Nama Karoo of S Namibia and W South Africa.



Descriptive notes. 13-14 cm; 17-21 g. Fairly small, buffy lark with rather large-headed appearance, remarkable wedge-shaped bill that is long and heavy along most of length and looks slightly uptilted. Dark eyestripe contrasts with buffy supercilium which extends onto forehead; distinctive dark T-shaped mark or "teardrop" under eye; ear-coverts brown; rather uniform buffy brown above, darker brown streaks on crown and upperparts; flight-feathers darker brown, pale buff edges and tips to secondaries; tail dark brown, outer 2-3 feathers with whitish on outer webs broadening towards base (in flight, showing as dark central triangle with white inverted triangles at edges, similar to tail pattern of a *Cercomela* chat); throat whitish, pale buffish-white below, breast with darker brown streaks; eyes brown (often held partly closed); bill horn-brown, base yellowish-horn; legs flesh-brown. Differs from *S. starki* in darker appearance, longer bill, no erectile crest; from *S. conirostris* in dark T-mark on face, much longer bill. Sexes alike. Juvenile is more boldly patterned, with white tips and dark subterminal bars on back and crown feathers, buff-edged upperwing-coverts, flight-feathers and tail with whitish tips, spotted below (some white tips), T-shaped facial mark less prominent. Voice. Soft "prrp prrp" or "prrp prrp treep" call, primarily in flight, also on ground during foraging; displaying male utters similar calls.

Habitat. Stony plains with ephemeral grasses and scattered bushes. Often in areas with very little vegetation, and very few other bird species, but generally remains fairly close to water sources; usually nests within easy commuting distance of drinking water. Apparently roosts in shallow depressions in open gravel plains.

Food and Feeding. Insects and seeds. Adults feed extensively on large seeds of the ephemeral eight-day grass (*Enneapogon desvauxii*) that are produced singly in bases of leaf sheaths, where well protected from most granivores; consequently, this food resource is available for protracted periods following rainfall events, allowing this lark to be less nomadic than other arid-country granivorous birds in its range. Chicks fed almost entirely with insects, including large numbers of harvester termites (Isoptera), as well as a few caterpillars and once a small butterfly (Lepidoptera). Feeds on the ground, singly or in pairs, outside breeding season in small flocks of up to 30 individuals; has slow, somewhat ponderous gait. Uses heavy bill to flip over small stones and search for insects beneath; also extracts seeds directly from grasses. Regularly visits water to drink.

Breeding. Primarily in Aug-Dec, sometimes from Jun, and usually well synchronized at any one site; largely independent of rainfall, and even some evidence that breeding activity depressed following good rains, despite apparently increased abundance of insects (for chick-feeding) at such times. Monogamous; solitary, but nests can be less than 10 m apart. Male has low display flight with slow, exaggerated wingbeats and depressed tail. Nest-site unusual, in open gravel plain well away from vegetation, although sometimes next to a small stone (may provide visual reference for the birds); excavates fairly deep depression in ground, using the legs and wings, sometimes several scrapes made before final one selected for use, scrape usually lined with small stones and then dry grass and feathery grass awns, usually a broad "apron" of small stones (up to 200) and grass carefully placed around rim (thought to break up outline of nest and conceal signs of excavation, making it less visible to predators). Clutch invariably 1 egg, clutch size unaffected by rainfall; incubation by both parents, usually in fairly short shifts, change-overs particularly frequent, every 10 minutes, in very hot weather, sitting bird does not leave nest to defecate (droppings accumulate on rim), incubation period 11-13 days; newly hatched chick brooded by both parents for several days, brooding adult sitting extremely tight, almost allowing itself to be touched, when parent does leave nest chick is partly protected by its resemblance to a collection of grass seeds; fed by both parents, up to 17 meals per hour, in hot weather shaded by one parent standing erect over it and typically awaiting return of food-carrying partner before leaving, thus slowing feeding rate to only 10 meals per hour; chick leaves nest after 10-12 days, occasionally up to 14 days, before able to fly. Breeding success generally low owing to high rate of nest predation, mostly by small mammals such as mongooses (Herpestidae); only 37% of clutches survive to hatching date, and 80% of these hatch, then 78% of broods survive to fledge, giving overall breeding success of 20% and mean of 0·2 young fledged per attempt; heavy rain can flood nest, killing chick.

Movements. Virtually resident in some areas, but subject to irregular movements, especially towards edges of range. Occasional vagrancy indicated by record of a single juvenile in SW South Africa (near Cape Town).

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Scarce and local, and patchily distributed. Non-breeding flocks only small, up to 30 individuals. No evidence of any decrease in range or population. Factors affecting this species' distribution not understood; could be adversely affected by livestock grazing, although it may also have benefited from creation of watering points for livestock. Population dynamics require further investigation; need for one parent to shade chick during heat of day, thereby limiting food-delivery rate, has been suggested as reason for small clutch size, but several other alaudids manage to raise two chicks in even more extreme conditions, e.g. *Eremopterix nigriceps* in Saudi Arabia. High predation risk may also explain small clutch size (bet-hedging); siting of nest away from vegetation likely to be an adaptation to minimize nest losses to terrestrial predators, which routinely search around base of shrubs and grass tufts.

Bibliography. Barnes (2000), Brooke (1984b), Collar & Stuart (1985), Dean & Colston (1988), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Hockey & Sinclair (1981), Keith *et al.* (1992), Lloyd (1997, 1999), Mackworth-Praed & Grant (1962), Maclean (1993a), Sinclair & Hockey (1996), Stattersfield & Capper (2000), Steyn & Myburgh (1989, 1991), Tarboton (2001), Winterbottom (1972b).

Genus *PSEUDALAEMON* E. L. Phillips, 1898

86. **Short-tailed Lark**

Pseudalaemon fremantlii

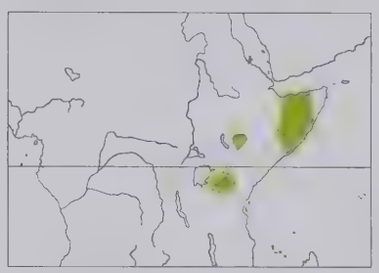
French: Cochevis à queue courte **German**: Bartlerche **Spanish**: Alondra Colicorta

Taxonomy. *Calendula fremantlii* E. L. Phillips, 1897, Gedais, Somalia.

Peculiar lark of uncertain affinities. Has sometimes been placed in genus *Galerida*, and considered by some to form a superspecies with *G. modesta* and *G. magnirostris*, but differences too great for such treatment to be warranted. Three subspecies recognized.

Subspecies and Distribution.

P. f. fremantlii (E. L. Phillips, 1897) - Somalia and SE Ethiopia.
P. f. megaensis Benson, 1946 - S Ethiopia and N Kenya.
P. f. delamerei Sharpe, 1900 - S Kenya and N Tanzania.



Descriptive notes. 14-15 cm; male 23-26 g, female 19-25 g. Peculiarly short-tailed lark with large head and long, heavy bill. Nominate race has well-marked face, with buffish-white supercilium, dark eyestripe, and black crescent and vertical line under eye; heavily streaked above, with blackish-brown feather centres contrasting with pale buff-brown margins; flight-feathers grey-brown with narrow pale outer edges; tail dark brown, outer feathers with white outer webs, central feathers with broad grey-brown margins; whitish below, breast with blackish breast streaks that coalesce to form small patch at side of breast; eye pale hazel brown; bill horn-brown, paler yellowish base of lower mandible; legs whitish or straw-pink. Sexes alike. Juvenile has white feather tips on upperparts, diffuse brown spots on breast. Races differ in upperpart coloration and extent of streaking: *megaensis* is darker than nominate, upperparts more heavily streaked blackish and with more rufous feather edges, breast and sides more reddish-brown; *delamerei* resembles previous but more greyish-brown above, variable, some individuals more rufous-brown. Voice. Song, from ground, a rather slow series of mournful and sometimes slurred whistled notes, both ascending and descending in pitch. Calls "tewi" on flushing; also softer "chip" contact calls.

Habitat. Semi-arid grassland and open dry woodland, often at edge of grassy plains where some rocks and low shrubs present, from near sea-level to 1800 m in Somalia. Races *megaensis* and *delamerei* restricted to short, heavily grazed grassland and semi-arid scrub above 1000 m, to c. 1700 m; attracted to burnt areas.

Food and Feeding. Seeds, bases of grass leaves, corms, and at least some insects. Forages on the ground, singly or in pairs; in small flocks outside breeding season, sometimes in loose association with *Calandrella* larks. Often digs in ground or into bases of grass tufts with its long, heavy bill. Seeks shade under bushes during heat of day.

Breeding. Poorly known. Breeds May-Jun. Only two nests described, each in centre of grass tuft; clutch 3-4 eggs; nothing known about parental duties or incubation and fledging periods.

Movements. Resident and local nomad.

Status and Conservation. Not globally threatened. Locally common; occasionally abundant in Somalia, where non-breeding flocks of up to 50 birds recorded. Possibly less numerous in Kenya and Tanzania, where typically observed in pairs or small groups. Present in several protected areas, e.g. Serengeti and Arusha National Parks (Tanzania).

Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Bennun & Njoroge (1999), Benson (1946a), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Short *et al.* (1990), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), White (1957b), Zimmerman *et al.* (1996).

PLATE 61

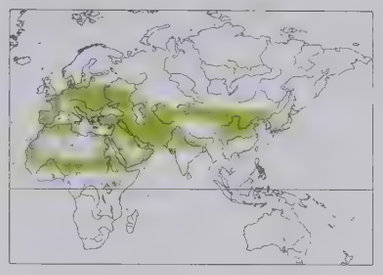

inches 3
cm 8
ssp cristata
ssp nigricans
ssp theklae
ssp carolinae
88
ssp praetermissa
ssp mallablensis
ssp senegallensis
ssp festae
87
ssp isabellina
ssp jordansi
89
ssp modesta
90
91
92
ssp nigrita
ssp arvensis
ssp dulcivox
ssp japonica
93
ssp gulgula
94
ssp pekinensis
ssp inconspicua
ssp vernayi
95
96
ssp arborea
ssp pallida

Genus *GALERIDA* Boie, 1828

87. Crested Lark
Galerida cristata

French: Cochevis huppé **German**: Haubenlerche **Spanish**: Cogujada Común
Other common names: Common Crested Lark

Taxonomy. *Alauda cristata* Linnaeus, 1758, Europe = Vienna, Austria.
Subspecific taxonomy extremely complex, with over 60 races described across species' huge range, seemingly a result of its mostly sedentary habits, and strong correlation of plumage ground colour and intensity of streaking with environmental factors (mainly soil colour, perhaps also general conditions of aridity and amount of sunshine); even within range of a given race, highly localized populations showing quite different colour, related to aberrantly coloured local soils, occur (e.g. within range of olive-grey *apuliae* in S Italy, ash-grey birds from E Calabria named as "*heraelaciniae*"); also well-marked variation, tending to be clinal, in body size, wing length and, especially, bill length. In general, differences among races slight and often noticeable only if large series of skins in fresh plumage compared, as many taxa described on basis of small number of specimes, sometimes variably abraded; intergradation also evident, both in Palearctic and in Afrotropics. Birds from NW Spain sometimes attributed to nominate race. Several attempts at "lumping" undertaken, in some cases reducing number of races to just 20, but results seem often too arbitrary, and perhaps preferable to recognize described races unless very compelling reasons exist to merge them with others. Geographical areas of especial difficulty, where several races meet and establishment of neat frontiers among them appears impossible, include Morocco, Nile Valley, Near East and Asia Minor. Thorough review needed. Besides listed races, others described include *madaraszi* from S Croatia (Dalmatia) and *muehlii* from Greece, both included in *meridionalis*; *moltschanowi* from Crimea, in *tenuirostris*; *ioniae* from W Asia Minor (Izmir region), *magdae* from S Caspian region and *submagna* from Transcaspia, all in *caucasica*; *weigoldi* and *ankarae* from Asia Minor, in *subtaurica*; *retrusa* from N China (Gansu) and *alaschanica* from Inner Mongolia (Alxa), in *magna*; *vamberyi* from Kara Kum Desert (Turkmenistan), in *iwanowi*; *gafsae*, *whitakeri* and *deprimozi* from Tunisia, all in *arenicola*; *deltae* from Nile Delta, in *nigricans*; *imami* from Yemen and *thomsi* from N Oman (Muscat), in *tardinata*; *moeritica* from N Egypt (Faiyum), in *maculata*; *caroli* from Egypt, *nubica* from Ethiopia and *eritreae* from Eritrea, all in *altirostris*; and *courtoti* from W Chad and *zalingei* from W Sudan, both in *alexanderi*. Thirty-seven subspecies provisionally recognized.
Subspecies and Distribution.
G. c. cristata (Linnaeus, 1758) - C Europe from Denmark and extreme S Sweden E to Belarus, S to France, N Italy, N former Yugoslavia, N Hungary and N Ukraine.
G. c. pallida C. L. Brehm, 1858 - Iberian Peninsula.
G. c. neumanni Hilgert, 1907 - W Italy (Toscana S to Rome area).
G. c. apuliae von Jordans, 1935 - S peninsular Italy and Sicily.
G. c. tenuirostris C. L. Brehm, 1850 - E Hungary and Romania E to S Russia (S to N Caucasus region) and W Kazakhstan.
G. c. meridionalis C. L. Brehm, 1841 - S formerYugoslavia S to Greece (including Ionian Is and Crete) and W Turkey.
G. c. caucasica Taczanowski, 1888 - E Aegean Is (Samothraki S to Samos), N Turkey, S Caucasus and W Transcaucasia.
G. c. subtaurica (Kollibay, 1912) - C Turkey E to S Transcaucasia, NW Iran and W Turkmenistan, S to N & E Iraq.
G. c. cypriaca Bianchi, 1907 - Rhodes, Karpathos and Cyprus.
G. c. zion Meinertzhagen, 1920 - S Turkey, Syria, E Lebanon and E Israel (S to Jerusalem).
G. c. cinnamomina Hartert, 1904 - W Lebanon (S from Beirut) and NW Israel (Mt Carmel and Haifa).
G. c. magna Hume, 1871 - S Kazakhstan E to S Mongolia and N China (Xinjiang E to N Gansu and Inner Mongolia).
G. c. leautungensis Swinhoe, 1861 - Manchuria and NE China.
G. c. coreensis Taczanowski, 1888 - Korea.
G. c. iwanowi Loudon & Zarudny, 1903 - C Turkmenistan and C & S Iran E to S Tadjikistan, Afghanistan and NW Pakistan.
G. c. lynesi Whistler, 1928 - N Kashmir (Gilgit Valley).
G. c. kleinschmidti Erlanger, 1899 - NW Morocco (E to Rif Mts, S to Middle Atlas).
G. c. riggenbachi Hartert, 1902 - W Morocco (Casablanca S to Sous Valley).
G. c. carthaginis Kleinschmidt & Hilgert, 1905 - coastal region from NE Morocco E to N Tunisia (E to Sousse).
G. c. randoni Loche, 1860 - Hauts Plateaux of E Morocco (E of upper R Moulouya) and NW Algeria.
G. c. macrorhyncha Tristram, 1859 - S Morocco and NW Algeria S of Atlas Saharien (E to Laghouat and Ghardaia) S to WC Mauritania (Atar area).
G. c. balsaci Dekeyser & Villiers, 1950 - coastal Mauritania.
G. c. arenicola Tristram, 1859 - NE Algerian Sahara (E from Biskra and Ouargla), S Tunisia (S of Gafsa and Sfax) and NW Libya (Tripolitania).
G. c. helenae Lavauden, 1926 - SE Algeria and probably neighbouring SW Libya.
G. c. festae Hartert, 1922 - coastal NE Libya (Benghazi E to Tubruq).
G. c. brachyura Tristram, 1865 - NE Libya (inland Cyrenaica), coastal N Egypt (E to Alexandria), and from N Sinai Peninsula and S Israel (Negev and Dead Sea region) E to S Iraq and N Saudi Arabia.
G. c. nigricans C. L. Brehm, 1855 - N Egypt (Nile Delta).
G. c. maculata C. L. Brehm, 1858 - Nile Valley from Cairo S to Aswan (Egypt).
G. c. halfae Nicoll, 1921 - Nile Valley from Aswan S to extreme N Sudan (Wadi Halfa).
G. c. senegallensis (Statius Muller, 1776) - S Mauritania, Senegambia and Guinea-Bissau E to Niger.
G. c. jordansi Niethammer, 1955 - N Niger (Aïr Mts).
G. c. alexanderi Neumann, 1908 - N Nigeria E to W Sudan, and NE Central African Republic.
G. c. isabellina Bonaparte, 1850 - C Sudan (Kordofan E to R Nile).
G. c. altirostris C. L. Brehm, 1855 - E Sudan (E from Nile Valley) and Eritrea.
G. c. somaliensis Reichenow, 1907 - N Somalia, S Ethiopia and N Kenya.
G. c. tardinata Hartert, 1904 - S (perhaps also W) Arabia.
G. c. chendoola (Franklin, 1831) - S Kashmir foothills S to E Pakistan, W & N India (E to Bihar) and S Nepal.



Descriptive notes. 17-19 cm; c. 35-50 g. Medium-sized, rather bulky lark with prominent long, spiky crest, rather long bill, relatively short and broad wings rounded at tip, very short primary projection, narrow and pointed at tip outer primary reduced (0-8 mm short of tip of primary coverts), rather short tail, hind claw long (9-14 mm) and straight. Nominate race has buff-white supercilium and eyering, dark eyestripe and moustachial and malar stripes; crown and upperparts buffish grey-brown, heavily streaked dark brown, hindneck and rump less streaked; flight-feathers olive-brown, narrowly edged buffish to light cinnamon; tail with olive-brown central feathers, remainder black, except for distinctive buff-brown outer feathers; whitish below, more buff on breast side and flanks, broad blackish spot-like streaks on breast, narrow and more diffuse streaks on flanks; axillaries and underwing-coverts rusty (noticeable in flight); bill dark horn above, pale yellow-flesh below; legs pale flesh. Distinguished from very similar *G. theklae* mainly by slightly longer and paler bill, somewhat less well-defined streaking below, rusty underwing. Sexes similar. Juvenile has shorter crest, upperparts spotted white, chest spotted rather than streaked, outer primary broader and longer (from 2 mm short of to 6 mm beyond tips of primary coverts). Races differ mainly in ground colour of plumage (rather constant over large areas in N populations, often marked changes from very dark to very pale in S), intensity of streaking, also in bill size and shape (bill rather short, about half of head length, in Europe, Middle East and NE Africa, to very long, almost equal to head length, in NW Africa), and wing length (longer in Asiatic races), following details only a very rough guide: *pallida* is slightly paler than nominate, less clearly streaked, in S also smaller and more reddish-tinged; *neumanni* is more rufous-brown above, deeper buff below, streaking more distinct, wing shorter; *apuliae* is generally paler and greyer above, broad streaks poorly defined, breast tinged pinkish with heavy sharp streaks; *meridionalis* is slightly darker than nominate; *tenuirostris* has upperparts cold brownish-grey with slight buff tinge, streaks well defined, wing slightly longer, bill longer and usually thinner; *caucasica* resembles previous, but bill usually shorter and heavier; *subtaurica* is rather pale greyish with olive to isabelline tinge above, narrow brown streaks, breast with fairly heavy black spots; *cypriaca* is smaller and darker than previous, streaking heavier and sharper, bill shorter and thinner in E (Cyprus); *zion* is tinged cinnamon above, streaks quite broad and dark (paler and fainter in E), breast spotting thin; *cinnamomina* is darker than last, sandy cinnamon with narrow brown streaks above, heavier blackish streaks on breast; *magna* is pale and relatively plain, buffish with little streaking above, paler with few narrow streaks below; *iwanowi* differs from last in grey-tinged upperparts with more streaks, more streaks below; other Asian races generally greyer and well streaked in E (*leautungensis*, *coreensis*), colder grey-brown (*lynesi*) or sandy brown (*chendoola*) and well streaked in S; *kleinschmidti* is very like nominate, but darker with more distinct black streaks above, breast tinged light cinnamon with heavier black streaks, shorter wing; *riggenbachi* has cinnamon-brown upperparts well streaked, heavily streaked cinnamon-buff breast, short bill; *carthaginis* is more buff with narrower streaks, paler below, longer wing; *randoni* differs from last in larger size, longer bill, heavier streaking; *macrorhyncha* has streaking paler than last, appears more uniform; *arenicola* is like previous but still paler and sandier, also smaller, bill shorter; *festae* is cinnamon-rufous with well-defined narrow dark streaks above, cinnamon-buff below, breast heavily streaked; *brachyura* is greyish sandy above; *helenae* is plain reddish-brown above, rufous-buff below, large brown breast spots; *nigricans* is darkest race, dark olive-grey and heavily streaked above, light cinnamon below, broad black breast streaks extending to flanks; *maculata* is somewhat paler than last, streaks narrower and less dark; *halfae* resembles previous, but paler and greyer; *senegallensis* has pale greyish-brown upperparts with variable dusky streaking, off-white below, breast with buff wash and obvious dark streaks; *balsaci* resembles previous, but paler below; *jordansi* is rather plain rufous-brown above, rufous-buff below, with small, narrow spots or streaks on breast; *alexanderi* is brownish with cinnamon tinge above, lightly streaked, buffish-white below, breast dark-streaked; *isabellina* has light grey-brown upperparts strongly tinged cinnamon, only faintly streaked, very pale and almost unmarked below; *altirostris* is rather pale sandy brown above; *tardinata* is extremely similar to previous, perhaps marginally darker; *somaliensis* is duller and greyer than last. Voice. Male song, from ground or low perch or in flight, a long and varied combination of whistles, tremolos, twitters and double notes, rather soft and melancholic, often containing imitations of other birds; like song of *Alauda arvensis* but shorter, less musical, with separate strophes, very similar to *G. theklae* song but slightly less varied. Commonest call a fluty, musical, rather desolate "twee-tee-too"; flight call gentle "too-ee".
Habitat. In most of range, typical species of dry plains with sparse vegetation cover and dry cultivations; perhaps originally inhabited warm semi-desert and steppe, secondarily human-modified landscapes. Habitats include open farmed countryside in N Mediterranean Basin, alpha (*Stipa tenacissima*) steppe and deserts in N Africa and Middle East, and sandy semi-desert and dry cultivations in India; also forest clearings; also savanna in Afrotropics. Requires high amount of bare ground or dry pasture, covering c. 50 % of surface. Often found along roadsides and in similar open, dry places, e.g. railway yards. Mainly low or middle altitudes, usually avoiding mountain areas, but to 1500 m in Spain, 2000 m in Russia and above 2300 m in W Pakistan.
Food and Feeding. Invertebrates, seeds and green material; mainly invertebrates in spring-summer and seeds during autumn-winter. Very wide assortment of invertebrates taken, mostly beetles (Coleoptera) but also grasshoppers (Acrididae), ants, caterpillars, snails and spiders. Seeds mainly those of weeds, but also cereal grain; seems to prefer seeds less than 1·4 mm in diameter. Nestlings fed exclusively with invertebrates. Forages on ground, singly or in pairs; outside breeding season also in small groups, sometimes with other alaudids. Searches the ground for items, also digging holes up to 2 cm deep; digs in horse dung. Breaks open snail shells by smashing them against stone or similar hard object. Apparently needs to drink water.
Breeding. Season mainly Mar-Jun/Jul in N parts of range, from Apr in Spain; in Afrotropics, laying Sept-Jun in Senegambia, Apr-May in Mali, Nov-Mar and May in Nigeria, Dec-Mar in Ethiopia, Apr-May in Somalia, Mar in E Africa; breeds Mar-Aug in Pakistan and India; often 2-3 broods per year. Monogamous, but one nest (with anomalous clutch size) recorded as attended by three birds; solitary and territorial. Male song flight typically at heights of c. 30-70 m, sometimes 100-200 m, average duration c. 3-4 minutes but up to 37 minutes recorded. Nest built by female alone, untidy lining of grass or other vegetation placed in depression on ground, openly or beside shrub, internal diameter 5-8 cm; nests of first clutches more robust and elaborated, sometimes domed. Clutch 3-5 eggs, occasionally 6 (mode 3 N Africa, 4 Turkmenistan, 5 Israel); replacement laid if clutch de-

On following pages: 88. Thekla Lark (*Galerida theklae*); 89. Malabar Lark (*Galerida malabarica*); 90. Sun Lark (*Galerida modesta*); 91. Sykes's Lark (*Galerida deva*); 92. Large-billed Lark (*Galerida magnirostris*); 93. Eurasian Skylark (*Alauda arvensis*); 94. Oriental Skylark (*Alauda gulgula*); 95. Raso Lark (*Alauda razae*); 96. Woodlark (*Lullula arborea*).

stroyed or lost; incubation by female alone, beginning with last or penultimate egg, period 11-13 days; chicks fed and cared for by both parents, nestling period 9-10 days in xeric environments, 12-13 days in mesic ones; young begin first flights at 15-16 days, capable of full flight at c. 20 days. Breeding success variable, often low, nestling mortality 30-40 % or more; eggs and chicks often taken by terrestrial predators. Nest in Pakistan held full clutches of both present species and *Calandrella raytal*, both of which incubated; fledged juvenile in France fed by Yellow Wagtail (*Motacilla flava*).

Movements. Predominantly resident. Sedentary in much of range; some dispersive movement in C Europe and Mediterranean region. Partially migratory or fully migratory in N part of Asian range; wintering grounds from Saudi Arabia E to Pakistan and India; some of those farther E move to C & S parts of breeding range in E Asia. Accidental in Europe, in Britain, Finland and Malta; also recorded Canary Is, and Chad.

Status and Conservation. Not globally threatened. Widespread and common in many parts of huge range, extent of which is almost largest of all alaudids (second only to that of *Eremophila alpestris*). In Europe, highest estimated populations in Spain (400,000-1,000,000 pairs), Russia and Bulgaria (each 100,000-1,000,000), Italy and Romania (each 200,000-400,000), Hungary (50,000-100,000), Greece (50,000-200,000) and Portugal (10,000-100,000); relatively small populations now left in France (15,000-25,000), Germany (12,000-18,000), Poland (3000-5000), Czech Republic (1100-2200) and Austria (150-200 pairs); recorded densities decrease markedly from S to N and from E to W, from 0·47 birds/ha in best habitats in Spain to 0·05-0·07 pairs/ha in Denmark and to 0·02-0·03 pairs/ha in Germany. Widespread and very common over much of Turkey (over 3,000,000 pairs estimated) and in Cyprus; common in Lebanon, very common in N Jordan (far fewer in S) and widespread in Israel (a few thousand pairs); widespread and very common in Iraq, and breeds commonly in Kuwait in years of good rainfall; very common in Arabia, commonest and most widespread lark in N Yemen. Common and very widespread in Pakistan, fairly common to locally common in rest of Indian Subcontinent range (but rare in E Nepal); common in suitable terrain in China (less so in winter). In African range, one of commonest larks in N, and abundant in Egypt; locally common to very common from Senegambia E to Sudan, Ethiopia and Somalia; fairly common in Kenya. Widespread decline, both in range and in numbers, recorded in W & C Europe, following marked range expansion in second half of 19th century and early 20th century (when colonized S Fennoscandia), and now extinct in several countries; last bred in Norway in 1972, Luxembourg in 1973, Sweden in 1989, Switzerland in 1990; not recorded since 1993 in Lithuania, and very low populations remaining in Denmark (15-17 pairs in 1999, decrease from 300-500 in 1988), Netherlands (below 400 pairs in 1991, 3000-5000 in 1979) and Belgium (c. 100 pairs in 1990, c. 400 in 1971); also declines in S Europe (Spain, Italy, Greece), but populations apparently still stable in E Europe (Hungary, Bulgaria, Romania, Russia). Threats include agricultural intensification (with generalized overfertilization leading to overgrown vegetation in wastelands and road margins), changes in urbanization practices (new housing or industrial areas now quickly forested), afforestation schemes and, possibly, climatic change. Reported as causing damage to agricultural crops during winter in Pakistan, where it attacks cultivated shoots of rape (*Brassica napus*) and chickpea (*Cicer arietinum*) plants, as well as sunflowers (*Helianthus*); also in Israel, where officially declared a pest species.

Bibliography. Abs (1963), Adamian & Klem (1999), Ali (1996), Ali & Ripley (1987), Annezo (1990), Archer & Godman (1937-1961), Arndt (1981), Averin & Ganya (1970), Barlow *et al.* (1997), Bauman (1987), Bennun *et al.* (1997), Bergmann & Helb (1982), Bernis (1971), Bobčík (2000), Brooks, Ahmad & Hussain (1987), Brown *et al.* (1997), Bub & Herroelen (1981), Buchweitz (1997), Bundy (1976), Bundy & Warr (1980), Cave & Macdonald (1955), Chen Linna & Shi Yonggang (1981, 1982), Cheng Tsohsin (1987), Chytil (1991), Clarke (1980), Cornwallis & Porter (1982), Cramp (1988), Dekker & Dickinson (2001a), Dementiev *et al.* (1970), Díaz (1994c, 2003a), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Dorst & Pasteur (1954), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dubois *et al.* (2000), Dupuy (1969), Dwarshuis (1980), Elgood *et al.* (1994), Étchécopar & Hüe (1964), Ferguson-Lees (1962), Garb *et al.* (2000), Garoche (1999), Gilet (1960), Glutz von Blotzheim & Bauer (1985), Gnielka (1985), von Goethe (1994), Goodman *et al.* (1989), Gore (1990), Greig-Smith (1976), Grimes (1987), Grimm (2000), Grimmett *et al.* (1998), Groh & Abs (1963), Gubitz (1982, 1983), Guo Ling (1977), Hagemeijer & Blair (1997), Handrinos & Akriotis (1997), Hartley (1946), Haubold (1988), Hazevoet *et al.* (1993), Heath *et al.* (2000), Heatwole & Muir (1982), van Heezik & Seddon (1999), Heim de Balsac (1936), Heim de Balsac & Mayaud (1962), Hejl (1990), Heyne (1992), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Hulten *et al.* (1989), Hustings *et al.* (1992), Inskipp & Inskipp (1991), Isenmann & Moali (2000), Jennings (1980b, 1981), Jensen & Kirkeby (1980), Jones (1991), Karnas (1986), Kasybekov & Kurmankulov (1994), Keith *et al.* (1992), Kerautret (1979), Kiis (1985), Kirschke (1994), Kleene & Michaelis (1987), Kren (2000), Kummer (1983), Labitte (1957b), Ledant *et al.* (1981), Lesinski (1989), Lewis & Pomeroy (1989), Línek (1999), Liu Huanjin (1979), Mackworth-Praed & Grant (1960, 1970), Magyar *et al.* (1998), Makatsch (1976), Marchant (1963), Marechal (1987), Mayaud (1985), Mayer (1995), Meinertzhagen (1951, 1954a), Meschini & Frugis (1993), Meyer (1982), Meyer de Schauensee (1984), Mihaly (1980), Møller (1978, 1985), Morel & Morel (1990), Mountfort (1954), Müller (1989), Niethammer (1955a), Orban (1999), Pareigis (1989), Pätzold (1986), Paz (1987), Popenko (1979), Ramadan-Jaradi & Ramadan-Jaradi (1999), Rendahl (1963), Riedel (1995), Rieder & Aubrecht (1994), Rietkerk & Wacher (1996), Riley (1989), Ripley (1982), Ritschel-Kandel & Richter (1992), Roberts (1992), Roselaar (1995), Rufino (1989), Sage (1964), Salvan (1968), Sane & Wassmer (1999), Scherner (1996), Schönwetter (1979), Serle (1943), Shirihai (1996), Shkedy & Safriel (1991, 1992a, 1992b), Simmons (1951), Simms (1992), Snow & Perrins (1998), Stahl (1989), Stepanyan (1990), Strijbos (1981), Sudhaus (1966), Sultana & Gauci (1982), Svensson *et al.* (1999), Tellería (1981), Tellería *et al.* (1999), Thomsen & Jacobsen (1979), Tieleman *et al.* (1999), Tretzel (1965), Triplet (1981), Ullman (1994), Valverde (1957), Varadinov & Nankinov (1978), Vaurie (1955, 1959), Venel (1992), Verschoore (1982), Waldenström (1984), Walker (1981a, 1981b), Wallace (1983, 1984), Watson (1962), Welch & Welch (1984), Whistler (1941), White (1961a), Willemsen (1980), Zang & Suedbeck (2000), Zimmerman *et al.* (1996), Zink (1973-1985).

88. Thekla Lark

Galerida theklae

French: Cochevis de Thékla **German**: Theklalerche **Spanish**: Cogujada Montesina

Taxonomy. *Galerita Theklae* A. E. Brehm, 1857, Xàtiva, near Valencia, Spain.

Sometimes treated as forming a superspecies with *G. malabarica*, and has often been treated as conspecific, but proof of close relationship lacking. Marked geographical variation in colour, rather slight in size; variation strongly clinal in W of range, from grey-brown in N (Spain) to sandy-coloured in S (Sahara). Described race *aguirrei* (E Morocco) synonymized with *ruficolor*; birds named as race *deichleri* (Sahara of NE Algeria and SC Tunisia) considered to involve bleached individuals of *carolinae*. Genus name of original description based on unjustified (and indeed invalid) emendation of *Galerida*. Twelve subspecies currently recognized.

Subspecies and Distribution.

G. t. theklae A. E. Brehm, 1857 - E & S Portugal, Spain (including Balearic Is) and extreme S France (Roussillon).

G. t. erlangeri Hartert, 1904 - N Morocco (E to Algerian border, S to Middle Atlas).

G. t. ruficolor Whitaker, 1898 - NE & C Morocco, coastal Algeria and N Tunisia.

G. t. theresae Meinertzhagen, 1939 - SW Morocco (S from Anti-Atlas Mts) and Western Sahara.

G. t. superflua Hartert, 1897 - Hauts Plateaux in NE Morocco (E of R Moulouya) and N Algeria (S to Atlas Saharien) E to Tunisia.

G. t. carolinae Erlanger, 1897 - N Sahara from extreme E Morocco (Figuig) E to NE Libya, probably also extreme NW Egypt (Salum).

G. t. praetermissa (Blanford, 1869) - highlands from S Eritrea S to C Ethiopia.

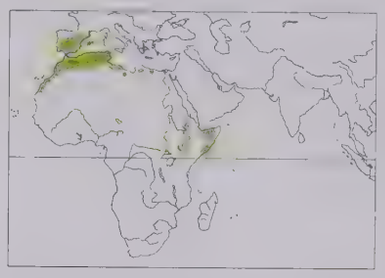
G. t. huei Érard & de Naurois, 1973 - SC Ethiopia (Bale Mts, Arussi).

G. t. huriensis Benson, 1947 - S Ethiopia and N Kenya (Huri Hills S to Marsabit).

G. t. ellioti Hartert, 1897 - N & C Somalia.

G. t. harrarensis Érard & Jarry, 1973 - E Ethiopia (Harar, Jijiga).

G. t. mallablensis Colston, 1982 - coastal S Somalia.



Descriptive notes. 15-17 cm; c. 30-40 g. Medium-sized, rather bulky lark with obvious crest, medium-length bill, rather short and broad-based wings with almost no primary projection, outer primary reduced (3 mm short of to 4 mm beyond tips of primary coverts), shortish tail, rather long (9-14 mm) straight hind claw. Nominate race has whitish supercilium and eyering, dark eyestripe and moustachial and malar stripes; crown and upperparts grey-brown, heavily streaked blackish, more finely so on hindneck, rump plainer, uppertail-coverts rufous-tinged; flight-feathers dark olive-brown, narrowly edged buffish to light cinnamon; tail olive-brown to greyish centrally, remainder black, except for pale rufous outer feathers; whitish below, breast side and flanks strongly tinged buff, lower throat to breast and breast side with well-defined large blackish spots (usually merging to form heavy streaks); axillaries and underwing-coverts greyish; bill dark horn-brown, paler base of lower mandible; legs flesh-brown to yellowish-flesh. Distinguished from very similar *G. cristata* by shorter and less decurved-looking bill (both mandibles convex), shorter and less spiky crest, usually better-defined breast streaking, greyer underwing, also marginally smaller and slimmer. Sexes similar. Juvenile has shorter crest, spotted upperparts, less intense chest streaking. Races differ mainly in coloration and in intensity of streaking, also in size and bill size: *erlangeri* is darker than nominate, streaking above and below broadest and blackest, bill longer; *ruficolor* is slightly paler than previous, feather edgings above more rufous, streaks below less intense; *theresae* resembles previous, but more rufous above, narrower streaks above and below; *superflua* is paler above, greyer or more sandy-coloured (variable), whiter below, upperparts and breast less streaked; *carolinae* is small and pale, light sandy to greyish with pinkish tinge above, plain or with minimal rufous streaking, mostly white below (sometimes pinkish wash), few scattered rufous-brown breast streaks, those in sandiest habitats often very pale and plain-looking ("*deichleri*"); *praetermissa* is small and dark, heavily black-streaked above, buffish below, breast spots relatively small and indistinct; *huei* is like previous but upperparts streaks heavier and blacker; *huriensis* differs from previous in paler upperparts, more distinctly streaked crown, whiter throat, pinkish belly; *ellioti* resembles last, but upperparts paler and more sandy rufous; *harrarensis* is darker than previous, broader streaks above and on breast, bill smaller; *mallablensis* is much greyer, lacks warm tones, upperparts feathers edged whitish to greyish or cold buffish, rump and tail-coverts grey, breast with relatively heavy dark brown spots. VOICE. Male song, mostly in flight or from top of bush, protracted series of whistles, twitters and warbling notes, very like that of *G. cristata* but perhaps more varied and joyful; often mimics songs of other bird species. Commonest call a fluty whistling of usually 3-4 notes, similar to that of *G. cristata* but more varied and energetic and with marked emphasis on final note.

Habitat. Rugged areas with shrubs and with high percentage of bare ground or semi-arid pasture; typically in hilly and broken landscapes, with rocky substrates. In Mediterranean Basin found in shrub-steppe and scrub of various botanic composition, often notably tall (1-1·5 m), but always with plenty of bare ground or short grass; also olive (*Olea*) and almond (*Prunus amygdalus*) groves and vineyards; usually avoids cereal cultivations. In dry streambeds with scattered oleander (*Nerium oleander*). Also arid or semi-arid steppic habitats or low acacia (*Acacia*) scrub in S of range. Common in lava desert in Kenya. At 50-2200 m, mostly below 1000 m; to 3200 m in S.

Food and Feeding. Mainly insects, also seeds, to lesser extent green plant material. Diet varies with season: mainly invertebrates in spring, mixed with seeds in early summer, and mainly seeds and plant shoots in summer-autumn. Very wide assortment of invertebrates and seeds recorded. Nestlings fed exclusively with invertebrates, mainly grasshoppers (Acrididae), spiders, caterpillars, mantids and beetles (Coleoptera), size range 12-21 mm, increasing through season. Forages on ground, singly or in pairs; outside breeding season also in family groups or small flocks of 5-10 individuals, occasionally up to c. 20, sometimes mixed with *Calandrella rufescens* or *Eremophila bilopha* in Africa, occasionally with *G. cristata*. Searches for items on ground, peers under stones. Breaks open snail shells by smashing them against rock or stone.

Breeding. Laying Feb-Jun (mostly from May) in N of range, from early Apr in N Africa but sometimes from Feb in W Morocco; in Somalia May-Jun in N, to Jul and once in Jan in S; May in E Africa; 1-2 broods, in Spain sometimes three. Monogamous, apparent pair-member fidelity during successive clutches, although extra-pair paternity recorded. Territorial. Male song usually from bushtop, sometimes in low flight, occasionally in high circling flight. Nest a depression on ground beside or beneath shrub or tuft, lined with grass stems, internal diameter 8-9 cm, earliest ones with small rampart of sticks, orientated mainly to NE-NW quarter. Clutch 3-5 eggs, rarely up to 7 (mode 4), in Spain no change in clutch size through season; incubation by female alone, beginning with last or penultimate egg, period 12 days; chicks cared for and fed by both sexes, leave nest at 9 days, sometimes later if nest not disturbed, fledging at 15 days. Breeding success often low; nest losses 80-90%. Interspecific nest parasitism recorded.

Movements. Resident. Sedentary in most of range, but some apparent longer dispersive movement or wandering in some areas. Occasional records in NW Mauritania presumably refer to vagrants.

Status and Conservation. Not globally threatened. Generally common or very common. In Europe, Iberian population estimated during early 1990s at 1,400,000-1,700,000 pairs, 94% of these in Spain, where widespread in all Mediterranean climate areas (most abundant in SE, i.e. Almería, Granada and Murcia provinces) and becoming progressively scarcer towards N & W; densities in favourable habitats 0·2-0·4 birds/ha, average maximum in best habitats c. 0·7 birds/ha. Recent declines in some areas of Spain attributed to irrigation and afforestation of steppic areas; at Las Amoladeras Reserve (Almería), sharp population decline due to increase in numbers of rabbits (*Oryctolagus cuniculus*) and foxes (*Vulpes vulpes*) following cessation of hunting. Tiny population in S France (Pyrénées-Orientales and Aude) numbers only 10-100 pairs. Common and widespread in most of N African range, and abundant in Western Sahara; probably commonest lark in Morocco (much more common than *G. cristata*), widespread in N Algeria (densities of 0·1-0·2 pairs/ha recorded), common in N Tunisia (numerous in some mountain areas), and in Libya locally common in Tripolitania and common in hills in Cyrenaica;

in Egypt probably breeds in extreme NW (Salum area), where recorded as common in 1920 and 4 males displaying in Mar 1994, but region seldom visited by ornithologists; possibly a very rare resident in NW Mauritania, where few records hitherto presumed to involve vagrants or wanderers. In E African range frequent in Ethiopia (W & SE Highlands and in S), and abundant and widespread in Somalia, where one of the commonest alaudids; locally common in N Kenya deserts E of L Turkana, and especially numerous in Dida Galgalu Desert.

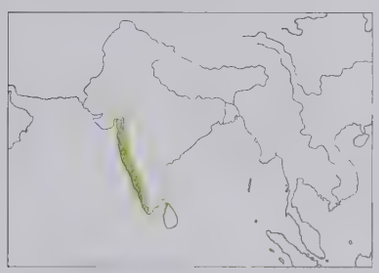
Bibliography. Abs (1963), Archer & Godman (1937-1961), Ash & Miskell (1998), Bergmann & Helb (1982), Bernis (1971), Blondel (1962), Britton (1980), Brosset (1956, 1961), Bub & Herroelen (1981), Bundy (1976), Cañadas *et al.* (1982), Cramp (1988), Díaz (2003b), Dorst & Pasteur (1954), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dubois *et al.* (2000), Érard & Jarry (1973), Érard & de Naurois (1973), Étchécopar & Hüe (1964), García & Serrano (2003), Goodman *et al.* (1989), Goriup (1988a), Guichard (1963), Hagemeijer & Blair (1997), Hall & Moreau (1970), Heath *et al.* (2000), Heim de Balsac (1936), Heim de Balsac & Mayaud (1962), Hernández Carrasquilla (1998), Herranz *et al.* (1997), Hódar (1995), Hollom *et al.* (1988), Isenmann & Moali (2000), de Juana *et al.* (1988), Keith *et al.* (1992), Ledant *et al.* (1981), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Manrique & Yanes (1994b), Mayaud (1985), Meinertzhagen (1951), Mountfort (1954), Nicolau-Guillaumet (1999a), Niethammer (1955a), Pasteur (1956), Rufino (1989), Schönwetter (1979), Short *et al.* (1990), Snow & Perrins (1998), Stevenson & Fanshawe (2002), Suárez & Manrique (1992), Suárez, Manrique & Yanes (1991), Suárez, Yanes *et al.* (1993), Svensson *et al.* (1999), Tellería *et al.* (1999), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Ullman (1994), Urban & Brown (1971), Valverde (1957), Vaurie (1959), Wallace (1965), White (1961a), Wunderlich (1980), Yanes (2000), Yanes & Oñate (1996), Yanes & Suárez (1995, 1996a, 1996b, 1997), Yanes, Herranz, Manrique *et al.* (1997), Yanes, Herranz & Suárez (1995, 1996), Yanes, Suárez & Manrique (1991), Zimmerman *et al.* (1996).

89. Malabar Lark

Galerida malabarica

French: Cochevis de Malabar **German**: Malabarlerche **Spanish**: Cogujada Malabar
Other common names: Malabar Crested Lark, Short-crested Lark

Taxonomy. *Alauda malabarica* Scopoli, 1786, China; error = Malabar coast, western India.
Sometimes treated as forming a superspecies with *G. theklae*, which often considered conspecific, but proof of close relationship lacking. Named race *propinqua*, known only from Londa district (Bombay), considered indistinguishable from other populations. Monotypic.
Distribution. SW India S from SE Gujarat.



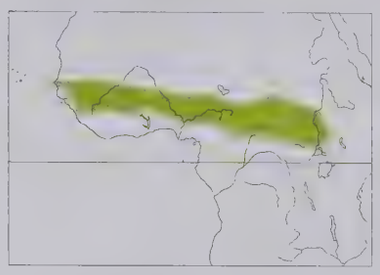
Descriptive notes. c. 16 cm. Medium-sized, fairly sturdy lark with prominent spiky crest (rather inconspicuous when folded), quite deep-based medium-long bill, fairly short tail. Has moderately distinct buffish supercilium, rather distinct dark loral stripe, and buffish or pale grey-brown ear-coverts with some darker streaking (mainly towards rear); crown and upperparts rufous-brown to more grey-brown, strongly streaked blackish-brown; upperwing-coverts and tertials dark grey-brown or blackish-brown with buffish tips and edges; remiges and tail dark grey-brown, penultimate rectrix with mostly rufous-buffish outer edge and sometimes tip of inner web, outermost rectrix with rufous-buff wedge of varying prominence on inner web; breast and flanks buff, breast with heavy blackish streaking, rest of underparts pale buffish or buffish-white, underwing extensively pale rufous; upper mandible mainly dark grey, lower mandible pale pinkish or slightly yellowish-tinged; legs pale pinkish. Distinguished from *G. cristata* (of race *chendoola*) by more rufous coloration and heavier streaking above, more buffish below, especially breast and flanks, deeper rufous-buff in outer tail, shorter and relatively deeper-based bill; from *G. deva* by larger size, less thick bill, paler and less uniformly coloured underparts with more profuse and usually heavier dark breast streaks. Sexes similar in plumage, female on average smaller than male. Juvenile has prominent whitish feather tips above, looking scaly or white-spotted. Voice. Song, in flight or, more commonly, from ground or low perch, comparatively slow, rich and varied, a mixture of different kinds of sounds, predominantly soft, piping, melancholy ones, including mimicry of other species; commonest call a quick series of 2-4 soft, piping, melancholy whistles. Vocalizations very similar to corresponding ones of *G. cristata*.
Habitat. Dry open habitats, preferably with some scrub and rocks, e.g. agricultural land, grass-covered stony hill sides and forest clearings; to 2000 m.
Food and Feeding. Diet poorly known; apparently seeds and invertebrates, e.g. orthopterans, beetles (Coleoptera), ants (Formicidae). Forages on ground, singly or in pairs; also in flocks of up to c. 30 individuals in non-breeding season.
Breeding. Breeds in all months, with possible exception of wettest ones (Jun-Jul). Song-flighting male hangs more or less still or flies about in irregular "circles" with relatively slow-flapping wings and partly spread tail. Nest a cup of grass and roots lined with finer material, in depression on ground, sheltered by stone or tuft of grass. Clutch 2-3 eggs; incubation and nestling periods not documented.
Movements. Sedentary or dispersive.
Status and Conservation. Not globally threatened. Locally fairly common to common. No estimates of population size or breeding densities.
Bibliography. Ali (1969), Ali & Ripley (1987), Alström *et al.* (2004), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Grimmett *et al.* (1998), Koelz (1939), Pätzold (1994, 2003), Rasmussen & Anderton (2004), Ripley (1982), Stuart Baker (1926, 1935), Vaurie (1951a), Zacharias & Gaston (1999).

90. Sun Lark

Galerida modesta

French: Cochevis modeste **German**: Sonnenlerche **Spanish**: Cogujada Modesta

Taxonomy. *Galerida modesta* Heuglin, 1864, Bongo, Bahr-el-Ghazal, Sudan.
Has been considered to form a superspecies with *G. magnirostris*, also including *Pseudalaemon fremantlii* when that placed in present genus, but differences appear too great for such treatment to be warranted. Birds from Burkina Faso E to W Sudan named as race *giffardi* (often erroneously spelt as *giffordi*), but indistinguishable from nominate. Four subspecies recognized.
Subspecies and Distribution.
G. m. modesta Heuglin, 1864 - S Senegambia, S Mali and N Ivory Coast E to SW & S Sudan.
G. m. nigrita (Grote, 1920) - Guinea and N Sierra Leone.
G. m. struempelli (Reichenow, 1910) - highlands of N Cameroon.
G. m. bucolica (Hartlaub, 1887) - SE Central African Republic, NE DRCongo and extreme NW Uganda.



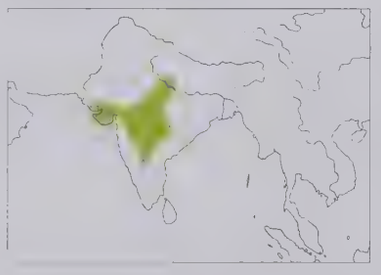
Descriptive notes. 14-15 cm; 18-22 g. Medium-sized, rather dark lark, heavily streaked above and on breast, with short erectile crest, rather small bill. Nominate race has creamy to buffish lores and supercilium, narrow dark eyestripe, brown ear-coverts, thin dark malar streak; crown and upperparts rufous to sandy rufous, blackish feather centres forming prominent streaks on crown, mantle and back, rump plainer and tinged cinnamon; wing-coverts blackish-brown with broad pale rufous margins, whitish tips; flight-feathers dark brown, narrowly edged rufous, tail blackish-brown, rufous edges of outer tail; throat whitish, breast buffy to pale rufous with heavy black streaking, belly and flanks slightly paler buff; underwing-coverts and axillaries rufous-buff; eyes dark brown; bill blackish-horn, whitish base of lower mandible; legs dark flesh-brown. Differs from *Mirafra rufocinnamomea* in slightly larger size, much more streaked plumage. Sexes alike. Juvenile has white feather tips above, appearing spotted, white margins of wing-coverts form two pale wingbars. Races differ primarily in plumage colour, tending to be paler in N, also in size: *bucolica* is darker than nominate; *struempelli* is larger than previous, also darker and more heavily black-streaked, with broader rufous edgings above; *nigrita* is smaller than last, darker and with narrower rufous edgings. Voice. Male song, in flight or sometimes from low perch, a series of sweetly whistled notes and buzzing sounds, often incorporating elements of songs of other birds, including bulbuls (Pycnonotidae) and swallows (Hirundinidae); also short, rather tuneless series of notes lasting 1-2 seconds, both from ground and in flight. Weak "chit-chit" when flushed.
Habitat. Open countryside, often rocky hills, where prefers areas of short grass and open rock; also occupies wide range of sparse grassy habitats, including fields and pastures. Often found on bare ground near villages and on sports fields.
Food and Feeding. Grass and other seeds, and insects. Forages on the ground, singly or in pairs; often in small flocks outside breeding season.
Breeding. Season Nov-Feb and May-Jul. Monogamous. Male sings in hovering aerial display. Nest built by female, accompanied by male, an open cup of grass and rootlets in shallow scrape on ground at base of a grass tuft, shrub or rock. Two clutches documented, each of 1 egg; nothing known about parental duties or incubation and fledging periods.
Movements. Resident in some areas; elsewhere, subject to more or less regular movements linked to seasonal rains, e.g. in Nigeria moves N in rains and S in dry season.
Status and Conservation. Not globally threatened. Locally common to not uncommon; very uncommon in extreme SE of range (NW Uganda). Adaptable; frequently occurs in agricultural lands and other human-modified habitats.
Bibliography. Bannerman (1953), Barlow *et al.* (1997), Borrow & Demey (2001), Byaruhanga *et al.* (2001), Chapin (1953), Cheke & Walsh (1996), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Érard & Morel (1994), Fishpool & Evans (2001), Grimes (1987), Jones (1991), Keith *et al.* (1992), Mackworth-Praed & Grant (1960, 1970), Nikolaus (1987), Salewski (1997b), Salvan (1968), Serle (1943), Short *et al.* (1990), Shuel (1938), Stevenson & Fanshawe (2002).

91. Sykes's Lark

Galerida deva

French: Cochevis de Sykes **German**: Devalerche **Spanish**: Cogujada de Deva
Other common names: Sykes's Crested Lark, Tawny/Deccan Lark

Taxonomy. *Alauda Deva* Sykes, 1832, Dukhun = Deccan, India.
Monotypic.
Distribution. WC & C India.



Descriptive notes. c. 14 cm. Quite small lark with prominent spiky crest (rather inconspicuous when folded), mostly buff plumage, medium-long stout bill, shortish tail. Has buffish supercilium, buffish ear-coverts with some dark streaking (mainly at rear), moderately distinct or indistinct dark loral stripe; crown and upperparts brownish-buff, heavily and contrastingly streaked blackish-brown, uppertail-coverts light rufous with little or no streaking; wings and tail blackish-brown or dark grey-brown, upperwing-coverts with buff fringes, penultimate rectrix with mostly warm buff outer edge and often tip of inner web, outermost tail feather with warm buff wedge on inner web; entire underparts warm buff or rufous-buff, breast with sparse thin dark streaks, mainly on sides, underwing extensively pale rufous; upper mandible mainly medium or dark grey, lower mandible pale pinkish; legs pale pinkish. Distinguished from *G. malabarica* by smaller size, deeper-based bill, paler, buffier and more contrastingly dark-streaked upperparts, deeper and more uniformly buff underparts, less profusely and more finely streaked breast. Sexes alike in plumage, female on average smaller than male. Juvenile differs in having prominent whitish feather tips above, giving scaly or white-spotted appearance. Voice. Male song, from ground or low perch or in flight, rich and varied, includes both harsh and clear notes, commonly with masterly imitations of other species, resembles songs of *G. cristata* and *G. malabarica* but fewer drawn-out whistles, more repetitions (phrases), more varied speed, harsher voice. Calls with various high-pitched, often multisyllabic, whistles and short guttural notes.
Habitat. Dry, stony areas with sparse scrubby vegetation, dry cultivation, and similar habitats; to c. 1000 m. Apparent preference for dark soils.
Food and Feeding. Diet poorly known; apparently seeds and invertebrates. Forages on ground, singly, in pairs or in small loose flocks; walks and runs; takes items mostly from ground surface.
Breeding. Little studied. Season at least Mar to Sept (probably more extensive), mainly May-Aug. Male performs high, sustained song flight with rather slowly flapping wings. Nest a small cup of grass and rootlets with finer lining, in scrape on ground, sheltered by stone or tuft of grass. Clutch 2-3 eggs, rarely 4; incubation and nestling periods not documented.
Movements. Sedentary; some short-distance dispersive movement.
Status and Conservation. Not globally threatened. Status uncertain; formerly probably fairly widespread and numerous, but now perhaps more local and less common. Relatively poorly known species.

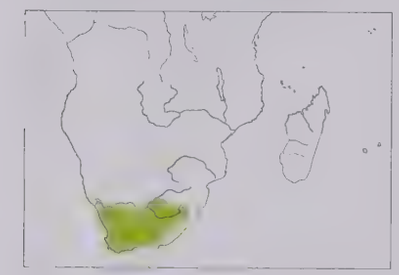
Bibliography. Ali (1996), Ali & Ripley (1987), Alström *et al.* (2004), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Grimmett *et al.* (1998), Mukherjee (1995), Pätzold (1994, 2003), Rasmussen & Anderton (2004), Ripley (1982), Stuart Baker (1926, 1935), Vaurie (1951a).

92. **Large-billed Lark**

Galerida magnirostris

French: Cochevis à gros bec **German**: Dickschnabellerche **Spanish**: Cogujada Picogorda
Other common names: (Southern) Thick-billed Lark(!)

Taxonomy. *Alauda magnirostris* Stephens, 1826, near Cape Town, South Africa.
Has sometimes been placed in a monotypic genus *Calendula*. Has been considered to form a superspecies with *G. modesta*, also including *Pseudalaemon fremantlii* when that placed in present genus, but differences appear too great for such treatment to be warranted. Geographical variation largely clinal, with clines of increasing body size and decreasing bill size from W to E. Birds from Lesotho sometimes separated as race *montivaga*, but probably better merged with *harei*. Three subspecies recognized.
Subspecies and Distribution.
G. m. sedentaria Clancey, 1993 - Karoo areas of extreme SW Namibia and W South Africa (E to Griqualand West).
G. m. magnirostris (Stephens, 1826) - winter rainfall area of SW South Africa.
G. m. harei (Roberts, 1924) - W grasslands of South Africa and Lesotho.



Descriptive notes. 18 cm; 35-48 g. Large, heavily built, straw-coloured lark with robust bill. Nominate race has fairly prominent creamy-buff to whitish supercilium, narrow dark eyestripe, faint dark moustachial line; crown and upperparts pale sandy brown, blackish-brown feather centres forming prominent streaks, rump less clearly streaked; wing-coverts dark brown with paler edges; flight-feathers and tail dark brown with buffish outer edges; whitish below, breast with dense heavy blackish-brown streaks, flanks with sparser narrow streaks, sometimes faint yellowish tinge on belly and undertail-coverts; underwing-coverts and axillaries light brown; eyes brown; bill dark horn-brown, obvious yellow base; legs pinkish-brown. Sexes alike. Juvenile has pale feather tips on upperparts, appearing pale-spotted above, white fringes of wing-coverts form two white wingbars, more buffy with diffuse rounded spots below, bill paler. Races differ in size, also in plumage tone: *sedentaria* is slightly more rufous above than nominate, wing and tail longer; *harei* has much smaller bill, plumage becomes slightly darker in E of range ("*montivaga*"). Voice. Typical song, in flight or from ground or perch, a fast, stereotyped, slightly wheezy "tit-it twiddle-iddle-eee" or "tit swee-ere-ee-ee", likened to sound of squeaky gate; in sustained song often mimics calls of other birds, single song bout of individual containing imitations of 13-20 species, including bustards (Otididae), cisticolas (*Cisticola*), coursers (Glareolidae), lapwings (*Vanellus*), longclaws (*Macronyx*), pipits (*Anthus*), sandgrouse (Pteroclidae), shrikes (Laniidae), sparrows (*Passer*) and starlings (Sturnidae), as well as other larks.
Habitat. Semi-arid grassland and dwarf shrubland, open coastal scrub, and fields. Most abundant in cereal cropland and pastures in Western Cape, as well as in montane grassland in Lesotho. Also common in open areas in Succulent Karoo; more local in grassy Nama Karoo, where found mostly along drainage lines and in bare areas.
Food and Feeding. Seeds of grasses, sedges, various forbs and legumes; also insects, including beetles (Coleoptera), caterpillars, cockroaches (Blattodea), termites (Isoptera) and ants. In the Karoo, grass seeds made up only 4% of all seeds consumed. Chicks fed mostly with insects. Feeds on the ground, singly or in pairs, rarely in small groups or family parties. Walks about, picks items from ground surface and bases of low plants; often uses robust bill for digging, excavates small bulbs, which then broken open and the flesh eaten. Also takes seeds directly from plants, and breaks open dung to obtain seeds and insect larvae. Regularly drinks water, especially in arid areas. Often perches on fence poles, less often on wires.
Breeding. Breeds chiefly during spring months Aug-Nov, occasionally later (in summer). Monogamous and territorial; pair-members remain together throughout year in most areas. Male performs laboured, dipping display flight up to 50 m above ground, lasting up to 5 minutes. Nest an open cup, varying in thickness, made of stems, grass leaves and rootlets, sometimes on foundation of sticks, and lined with wool or plant down, built in shallow scrape on ground, often at base of grass tuft, shrub or clump of earth; typically facing S or E in more arid areas. Clutch 2-4 eggs (mean 2·5); incubation period c. 16 days; chicks fed by both parents, at one nest 13 feeds per hour, faecal pellets removed by parents and carried at least 50 m from nest before being discarded; adults feign injury to distract intruders, may even fly up into face of human intruder; fledging period not known.
Movements. Largely resident; has been suggested that it undertakes some altitudinal movements in E of range, moving down from higher elevations in winter.
Status and Conservation. Not globally threatened. Generally common to very common. Has benefited from agriculture; abundant in cereal croplands in Western Cape. Also benefits from poor agricultural practices in the Karoo, often occurring only in areas where vegetation cover minimal as a result of overgrazing.
Bibliography. Broekhuysen (1963), Brooke (1985), Clancey (1993a), David (1971), Dean (1997), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Keith *et al.* (1992), MacGregor & Feely (1952), Mackworth-Praed & Grant (1962), Maclean (1974a, 1993a, 1999), Nuttall (2000), Quickelberge (1970b), Sinclair & Hockey (1996), Tarboton (2001).

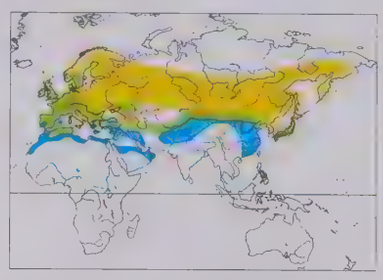
Genus *ALAUDA* Linnaeus, 1758

93. **Eurasian Skylark**

Alauda arvensis

French: Alouette des champs **German**: Feldlerche **Spanish**: Alondra Común
Other common names: Skylark, Common/European/Northern Skylark; Japanese Skylark (*japonica*)

Taxonomy. *Alauda arvensis* Linnaeus, 1758, Europe = Sweden.
May form a superspecies with *A. gulgula*, and has been considered conspecific. Race *japonica* sometimes considered a race of that species owing to similarities in plumage and structure; alternatively, treated by many as a separate species on grounds of constant differences in plumage and apparent sympatric breeding with race *lonnbergi* of present species in Sakhalin, but limits of E taxa disputed by others; further study required. Large number of races described, but distributions and geographical boundaries poorly understood, obscured by considerable individual variation within populations, also by intergradation, and most taxa identifiable only by comparing series of specimens at same stage of plumage wear; validity of some generally accepted taxa remains questionable. Other proposed races sometimes recognized include *ticehursti* (NW Iberia), included in *guillelmi*; *dementieva* (SE of Caspian Sea), in *dulcivox*; *alticola* (SE Altai), in *kiborti*; *nigrescens* (Amur Basin), in *intermedia*; and *buxtoni* (NE coast of Sea of Okhotsk), in *pekinensis*. Thirteen subspecies tentatively recognized.
Subspecies and Distribution.
A. a. scotica Tschusi, 1903 - NW Europe (Faeroe Is, N & W Scotland, Ireland, NW England).
A. a. arvensis Linnaeus, 1758 - N, W & C Europe (E to W side of Urals).
A. a. guillelmi Witherby, 1921 - NW Spain and N Portugal.
A. a. sierrae Weigold, 1913 - S Portugal and C & S Spain.
A. a. cantarella Bonaparte, 1850 - S Europe from NE Spain E, including Mediterranean islands, to C & N Turkey and Caucasus.
A. a. harterti Whitaker, 1904 - NW Africa.
A. a. armenica Bogdanov, 1879 - SE Turkey and Transcaucasia E to N Iran.
A. a. dulcivox Hume, 1872 - breeds SE European Russia and W Siberia, S to N Kazakhstan, NW China (Xinjiang) and SW Mongolia.
A. a. intermedia Swinhoe, 1863 - breeds NC Siberia from basin of R Vilyuy and middle R Lena E to R Kolyma basin, S to NE China and Korea.
A. a. kiborti Zaliesski, 1917 - breeds Altai E to Transbaikalia, N & E Mongolia and NW Manchuria.
A. a. pekinensis Swinhoe, 1863 - breeds NE Siberia (from upper R Indigirka) E to Koryakland and S to Kamchatka and N Kuril Is.
A. a. lonnbergi Hachisuka, 1926 - breeds N Sakhalin, Shantar Is (in SW Sea of Okhotsk), possibly also lower Amur Basin.
A. a. japonica Temminck & Schlegel, 1848 - S Sakhalin, S Kurils, Japan and Ryukyu Is.
Introduced (*scotica*) in New Zealand and Australia; nominate in W Canada (Vancouver I); and both races in Hawaii.



Descriptive notes. 16-19 cm; male c. 35-50 g, female c. 26-40 g (*arvensis*). Medium-sized, fairly stout lark with shortish bill, fairly long wings with long primary projection (especially migratory races), relatively long tail, short erectile crest. Nominate race has whitish supercilium and eyering, contrasting dark ear-coverts, indistinct thin dark moustachial and malar stripes; crown and upperparts variably olive-brown to brownish-rufous (greyer in E of range), heavily streaked blackish, nape somewhat paler and less streaked; wing-coverts darker with broad pale fringes, but lesser coverts paler and more buffish; flight-feathers and tail dark brown to blackish with buffish edges, secondaries and inner primaries tipped white, outer rectrices white (prominent white trailing edge of inner wing and white tail side in flight); white to pale buff below, breast washed light rufous-buff and heavily streaked blackish, flanks with narrower streaks; bill pale horn; legs pale yellowish-brown to flesh-coloured. Distinguished from very similar *A. gulgula* mainly by larger size, longer primary projection, more buffish (less rufous) wing patch, in flight broad white trailing edge of wing and white (rather than buff) outer tail feathers. Sexes alike in plumage, female smaller than male. Juvenile has upperparts mottled buff and blackish with white edgings, breast more spotted than streaked. Races differ mainly in size and overall plumage tone (shades of grey, brown or rufous), but differences subtle, and following details only a general guide: *scotica* is like nominate but darker, more strongly streaked, more rufous-toned; *guillelmi* is dark and rufous like previous, but smaller; *sierrae* is paler and less heavily streaked than last, duller and browner; *cantarella* is paler than previous, somewhat paler than nominate and with narrower streaking; *harterti* has more sandy, less olive, appearance than last, longer and thinner bill; *armenica* is cinnamon-tinged with strong black streaks above (back more spotted), greyish when worn, breast with cinnamon ground colour, larger; *dulcivox* is rather distinctive, large, pinkish-buff above (greyish in worn plumage), streaks narrow and contrasting; *intermedia* is smaller and duller; *kiborti* resembles previous but slightly darker; *pekinensis* is larger and darker, dark rufous-brown and heavily streaked above, lesser coverts mostly dark rufous, breast rufous and well streaked; *lonnbergi* is also large and dark; *japonica* resembles previous two but slightly smaller, somewhat darker, dark breast contrasting with white throat and belly, flanks unstreaked. Voice. Male song, in flight, a prolonged, continuous rapid twittering interspersed with slower, generally ascending, phrases, contains variable amounts of mimicry, particularly of waders (Scolopacidae); more subdued version given from ground or perch. Commonest call a rich, rolling "prreet" or "chirrup", monosyllabic or disyllabic.
Habitat. Most open habitats. Strongly associated with farmland throughout much of range, but also occurs on heathland and moorland, meadows, grassland, steppe, edges of marshes, dunes, even extensive forest clearings; generally avoids wooded areas and xeric habitats, with taiga presenting a barrier in N across most of Eurasia, and S limit set by deserts and arid steppes. In Europe, highest densities in coastal marshes and certain types of low-intensity farmland, particularly set-aside and grazed hay meadows. Much variation in numbers in different types of farmland, generally commoner in arable habitats than in grass; cereals particularly important, and can support high proportion of individuals in some populations, although densities lower than in natural habitats. Avoids tall vegetation; absent from otherwise suitable habitats if surrounded by trees. In non-breeding season usually associated with arable land, particularly cereal stubbles, and coastal habitats, including beaches. Sea-level to c. 1000 m; locally higher, to 2750 m in Caucasus, and at 3500 m in S Spain (Sierra Nevada); to at least 3000 m in C Asia.
Food and Feeding. Small invertebrates and seeds, also other plant material. Primarily insectivorous in breeding season and vegetarian in winter. Nestling diet almost entirely invertebrates, predominantly insect larvae. Wide range of invertebrates taken, especially insect larvae, beetles (Coleoptera), grasshoppers (Acrididae), moths (Lepidoptera), spiders, flies (Diptera), less frequently worms (Oligochaeta), molluscs (Mollusca), aphids (Homoptera), mites (Acarina) and others. Unripe cereal grains may be important at certain times of year, particularly during rain. Spilt cereal grain a very important food source in winter; other food taken in winter includes leaves of cereals, grass and weeds, weed seeds and various invertebrates. Forages on the ground, singly or in pairs; outside breeding season in small groups or large flocks, sometimes of thousands of individuals. Walks and runs; foraging methods consist almost entirely of picking items from ground surface,

but digging, uprooting of plants, picking items from plants and kleptoparasitism all recorded. Does not drink water.

Breeding. Late Mar/early Apr to Aug-Sept in most of range, limits dependent on weather and habitat structure (often ceasing at harvesting in agricultural habitats); season probably shorter among migratory populations in Asia; up to four (rarely five) broods per season, fewer in N. Monogamous, male closely guards female prior to nesting; solitary, territorial, mean territory size in lowland farmland in Switzerland 2-8·3 ha (probably similar throughout W & C Europe). Male has characteristic song flight, rising diagonally into wind with tail spread, wings fluttering, to c. 100 m (occasionally higher, to 200 m), hovering for c. 1-10 minutes, sometimes longer (to 20 minutes, exceptionally up to 1 hour), then gliding downwards in spirals before sudden plummet to earth. Nest, built by female alone, a thick layer of grass, lined with finer vegetation, placed in excavated scrape or in natural depression on ground among short vegetation, sometimes more exposed; rarely, a rampart of small stones on outside; nests rarely abandoned, but birds about to nest will move to different site for nesting if habitat grows too tall or dense to allow easy access (e.g. winter-sown cereals). Clutch 1-7 eggs, usually 3-5, varying regionally, temporally and with habitat; in Europe mean clutch size increases from W to E, largest in Caucasus region (mean 4·8), also highest in middle of season, and higher in habitats with optimum food availability; incubation by female alone, from last egg, period 10-13 days; chicks fed by both parents, faecal sacs initially swallowed by parent, later removed and deposited away from nest; leave nest at 8-10 days (when legs fully developed), fledging at c. 16-20 days, sometimes later (24 days). Nest losses high, c. 70% on average; wide range of nest predators. First breeding at 1 year. Maximum longevity at least 10 years.

Movements. Resident and migratory. Populations in W & S Europe and across S & E limits of range in Asia predominantly resident, with some short-distance dispersive movement; also, some short movements to lower altitudes, and from grass-dominated to arable-dominated landscapes. Those in N & C Europe and across most of Asia migrate after breeding, moving mostly into areas occupied by residents but also to regions S of breeding range; populations breeding as far E as Urals Mts move W & SW in Sept-Oct to wintering grounds in S Britain, the Low Countries, France, Italy and Iberia, probably also N Africa (racial identity of winter visitors uncertain); farther E, migrants winter from Middle East E to N Indian Subcontinent, E China and Korea, although movements and distribution outside Europe poorly documented. Males tend to winter farther N than females. General climate warming has resulted in higher proportion of birds in C & N Europe remaining all year on breeding grounds in recent decades. Capable of long-distance flights over oceans, recorded from NC Pacific (Midway Atoll) in 1960s; other extralimital records from Iceland, Bear I, Azores, Madeira, Mauritania and, in E, Borneo; vagrants in SW USA (California) probably involve race *pekinensis*.

Status and Conservation. Not globally threatened. Generally widespread and common throughout range. One of the most widespread breeding species in Europe; total population estimated in 1980s and 1990s at approximately 33,500,000 pairs, of which c. 6,600,000 in Poland, 4,900,000 in Germany, 3,500,000 in Spain, 3,000,000 in European Russia, 2,200,000 in Bulgaria, 2,000,000 in United Kingdom, 1,500,000 in Belarus, 1,500,000 in Latvia, 1,200,000 in Czech Republic, 1,000,000 in Ukraine. No comparable figures for Asia, but common to very common in most parts; possibly the most abundant bird species across vast steppe areas of C Asia. Recent breeding records from W North America, on Pribilof Is (Alaska), probably involve race *pekinensis*. Although still very numerous, is currently listed by BirdLife International as a "Species of Conservation Concern in Europe", owing to massive declines, particularly in W Europe, since 1960s (mainly since mid-1980s); these exceed 50% in many countries, e.g. populations on lowland farmland in Britain declined by more than 54% from 1969 to 1991 (representing loss of c. 1,500,000 breeding pairs), and numbers in Germany reduced by 60% (with some local extinctions) and in Netherlands by at least 75%; declines largely a result of intensification of agriculture, and recent research indicates that changes in management of cereal-growing and grassland (leading to reduced nesting and foraging opportunities, and diminution of food resources) have been principal causes, although high hunting pressure in some countries poses additional threat. Densities in grassland and low-intensity farmland in 1950s and 1960s 100-200 pairs/km², now much lower. Trends outside Europe largely unknown. Introduced populations in New Zealand and Australia apparently stable, but those in Canada (Vancouver I) and on some Hawaiian islands declining rapidly.

Bibliography. Adamian & Klem (1999), Ali & Ripley (1987), Aubin (1982), Aubin & Bremond (1983), Baicich *et al.* (1996), Barbier (2001), Beauchamp (1998), Becker (1996), Boutin *et al.* (2001), Brackenbury (1978), Brazil (1991), Browne *et al.* (2000), Busche (1989), Campbell, Dawe *et al.* (1997), Campbell, Van Damme & Johnson (1997), de Carli *et al.* (1998), Chamberlain (2001), Chamberlain & Crick (1999), Chamberlain & Gregory (1999), Chamberlain & Siriwardena (2000), Chamberlain & Vickery (2002), Chamberlain, Vickery & Gough (2000), Chamberlain, Wilson *et al.* (1999), Chu Yinan (1989), Chu Yinan & Li Jun (1987), Clark (1947, 1948), Cramp (1988), Cresswell (1994), Csicsáky (1978), Delius (1963, 1965, 1969), Dementiev *et al.* (1970), Dickinson & Dekker (2001a), Donald (2004), Donald & Vickery (2000), Donald, Buckingham, Moorcroft *et al.* (2001), Donald, Buckingham, Muirhead *et al.* (2001), Donald, Evans, Buckingham *et al.* (2001), Donald, Evans, Muirhead *et al.* (2002), Donald, Evans, Pain *et al.* (1998), Donald, Green & Heath (2001), Donald, Muirhead *et al.* (2001), Dougall (1996, 1997, 1998, 1999), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dzerzhinsky & Yesilevskaya (1986), Elmegaard *et al.* (1999), Eraud & Boutin (2002a, 2002b), Eraud *et al.* (2000), Evans *et al.* (1995), Gao Zhongxin (1978), Gerss (1989a, 1989b), Gillings & Fuller (2001), Glaubrecht (1992), Godfrey (1986), Goodbody (1950, 1953), Green (1978, 1980), Guo Ling (1992), Hagemeijer & Blair (1997), Hardman (1974), Heath *et al.* (2000), Hedenström (1995), Hedenström & Alerstam (1996), Hémery *et al.* (1992), Henderson, Cooper *et al.* (2000), Henderson, Critchley *et al.* (2001), James (1997), James *et al.* (2000), Jenny (1990a, 1990b, 1990c), Karlsson & Kjellen (1988), Koenig (1996), Labitte (1957a), Lange (1951), Leroux (1998), Lever (1987), Lou Juxian (1966), Lüps *et al.* (1993), Milsom *et al.* (2001), Morlan & Erickson (1983), Nikander (1994), Nussbaumer (1992), Odderskaer, Prang, Elmegaard & Andersen (1997), Odderskaer, Prang, Poulsen *et al.* (1997), Pätzold (1963, 1983), Pearce-Higgins & Grant (2002), Peter (1997), Poulsen (1993, 1996a, 1996b), Poulsen & Aebischer (1996), Poulsen *et al.* (1998), Robinson (2001), Scebba (2001), Schekkerman (1999), Schläpfer (1988, 2001), Schön (1999), Shishkin (1982), Snow & Perrins (1998), Spaepen (1995, 1996), Spaepen & Van Cauteren (1968), Stirling & Edwards (1962), Suárez, Garza & Morales (2003), Taapken (1982), Thompson *et al.* (1992), Tieleman & Williams (2002a), Tieleman, Williams & Buschur (2002), Tieleman, Williams, Buschur & Brown (2003), Toepfer & Stubbe (2001), Tryjanowski (1995a, 1995b, 1995c, 2000), Tucker (1994), Vaurie (1959), Verbeek (1988), Vickery & Buckingham (2001), Vignes (1996), Wahl & Wilson (1971), Wakeham-Dawson & Aebischer (1998), Wakeham-Dawson *et al.* (1998), Weibel (1998), Wilson & Browne (1993), Wilson *et al.* (1997), Wolfenden & Peach (2001), Xu (1992).

94. Oriental Skylark

Alauda gulgula

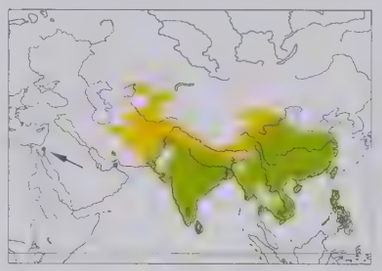
French: Alouette gulgule **German**: Orientfeldlerche **Spanish**: Alondra Oriental
Other common names: Small/Lesser/Little Skylark, Eastern/Indian (Small) Skylark

Taxonomy. *Alauda Gulgula* Franklin, 1831, Ganges between Calcutta and Varanasi (Benares), east India.

May form a superspecies with *A. arvensis*, and has been considered conspecific. Race *japonica* of that species sometimes included within present species owing to similarities in plumage and structure. Geographical variation to some extent clinal, size decreasing from N to S. Other described races are *punjaubi* (from Pakistan and NW India) and *transcaspia* (Turkmenistan), merged with *inconspicua*; *dharmakumarsinhjii* (Gujarat, in WC India), *australis* (SW India) and *herberti* (C & SE Thailand E to S Vietnam), included in nominate; *sala* (Hainan), included in *coelivox*; and *wolfei* (Luzon, in Philippines), merged with *wattersi*. Eight subspecies recognized.

Subspecies and Distribution.

A. g. inconspicua Severtsov, 1873 - S Kazakhstan, S Uzbekistan, E Turkmenistan and E Iran E to W & SW Tadjikistan, Pakistan and NW India.
A. g. lhamarum R. Meinertzhagen & A. Meinertzhagen, 1926 - SW Pamir, extreme NE Afghanistan and W Himalayas (NE Pakistan S to N Punjab, E to Nepal).
A. g. gulgula Franklin, 1831 - NC & NE India S to Sri Lanka and E to Indochina.
A. g. inopinata Bianchi, 1904 - much of Tibetan Plateau, E Qinghai, Gansu (except most NW) and extreme SW Inner Mongolia.
A. g. vernayi Mayr, 1941 - E Himalayas and neighbouring parts of China (SE Xizang, W Yunnan).
A. g. weigoldi Hartert, 1922 - C & E China (SE Gansu and S Shaanxi S to S & E Sichuan, and E along Yangtse Valley).
A. g. coelivox Swinhoe, 1859 - SE & S China (including Hainan I) and N Vietnam.
A. g. wattersi Swinhoe, 1871 - Taiwan and Philippines.



Descriptive notes. c. 15·5-18 cm; 24-30 g (*inconspicua*). Small lark with medium-long and thin bill, fairly short tail, short primary projection, small erectile crest. Nominate race has fairly distinct buffish supercilium; crown and upperparts warm rufous-buff, heavily streaked blackish-brown; wings blackish-brown or dark grey-brown, upperwing-coverts and tertials with buff tips and edges, remiges with narrow rufous edges; tail blackish-brown, central feather pair with brownish edges, outermost pair light rufous-buff; light rufous-buff below, deepest on breast, blackish streaks on breast extending variably to flanks; bill pale pinkish with dark grey culmen; legs pale pinkish. Distinguished from *A. arvensis* by smaller size, shorter primary projection and tail, proportionately longer and more pointed bill, more buffish outer tail feathers, no distinct white trailing edge of wing in flight. Sexes alike in plumage, female on average smaller. Juvenile has distinct white feather fringes and dark subterminal bands above, extremely similar to juvenile *A. arvensis*. Races differ in size, relative bill length, coloration and strength of streaking: *inconspicua* is slightly larger than nominate, also palest and least streaked, ground colour above pale buffy grey-brown, whiter below, outer tail feathers buffish-white or pale buffish; *lhamarum* is slightly larger than previous, more rufous and more heavily streaked above, more rufous-tinged on breast, has white outer tail feathers; *inopinata* is largest, proportionately shortest-billed, somewhat intermediate between previous two in colour and strength of streaking above, whitest race below, has white outer tail feathers; *vernayi* resembles nominate above, but has rather whitish belly and white outer tail feathers, larger size; *coelivox* is proportionately longest-billed, similar to nominate in size and in colour and pattern above, but underparts paler, outer tail feathers off-white; *weigoldi* resembles previous but is larger; *wattersi* is less rufous and more heavily streaked above than last two, outer tail feathers pale rufous-buff. VOICE. Song, in flight, sometimes from perch or ground, a prolonged warbling and twittering with short whistles, very similar to that of *A. arvensis* but less varied, with more repetitions, and generally covers narrower frequency range. Commonest call a short explosive buzz, distinctly different from calls of *A. arvensis*; some other calls, especially in breeding season, more like those of latter species.

Habitat. Open habitats with short vegetation, e.g. grassland and cultivation, also saline coastal marshes and mudflats, dry edges of lakes, rivers and paddyfields, and semi-desert with *Tamarix* and *Haloxylon* bushes; found also in large forest clearings, but generally avoids closed, wooded or broken terrain. Lowlands and middle elevations; locally higher, to c. 4300 m in N Pakistan and N India. Generally replaces *A. arvensis* in E Palearctic and Oriental Regions, but occurs at higher altitude in some areas, also found more commonly in marshes, at wetland edges and in semi-desert.

Food and Feeding. Diet poorly studied; seeds and insects. Nestlings observed to be fed with moths and caterpillars (Lepidoptera) and with unidentified insect larvae. Ingests grit. Forages on ground, singly, in pairs or in loose flocks.

Breeding. Mainly Mar-Aug; chiefly Apr-Jun in most of India, but Nov-Apr/May in extreme S parts; mainly May-Aug in Himalayas and on Tibetan Plateau; often at least two broods. Male song flight at great height, hovering with quivering wingbeats for long periods, tail closed throughout. Nest a cup of grass, lined with finer grass, hair or rootlets, in depression on ground, generally sheltered by tuft of grass or mound of earth. Clutch 2-5 eggs, usually 3; incubation by female alone or, possibly, by both sexes, period 10-11 days; chicks fed by both parents, leave nest at c. 10 days, fledge a few days later.

Movements. Sedentary in most of range; some local, e.g. altitudinal, movements may be undertaken. Race *lhamarum* and C Asian populations of *inconspicua* mainly migratory, leave breeding areas between Sept and early Oct, return late Mar to mid-Apr or even, in case of former race, early May; wintering areas uncertain. Race *inopinata* partly migratory, known to occur in winter in e.g. Nepal, Bhutan, N Bangladesh, NE India and N Myanmar. Rare but regular winterer in some places in Israel and Arabia. Accidental in other places in Arabia, in NE Egypt (Sinai, several records) and in Iraq.

Status and Conservation. Not globally threatened. Common in most of range, locally abundant; uncommon in Philippines and locally in SE Asia. Has probably decreased substantially in much of C, S, SE & E China, presumably as a result of the disappearance of suitable habitats.

Bibliography. Abdulali (1975a), Abdusalyamov (1973), Ali (1996), Ali & Ripley (1987), Ali *et al.* (1996), Alström *et al.* (2004), Beaman & Madge (1998), Brown & Palfery (1986), Carey *et al.* (2001), Chalmers (1991), Cheng Tsohsin (1987), Cramp (1988), Delacour & Jabouille (1940), Dementiev *et al.* (1970), Desfayes & Praz (1978), Dickinson & Dekker (2001a), Dickinson, Dekker, Eck & Somadikarta (2001), Eck (1973), Étchécopar & Hüe (1983b), Gavrilov (1999), Gochfeld (1978), Grimmett *et al.* (1998), Harris *et al.* (1996), Hartert (1910, 1922), Hirschfeld (1991, 1995), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Johansen (1944), Korelov (1970), Kovshar & Berezovikov (1995), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meinertzhagen (1951), Mohapatra & Prakash (1990), Parkes (1988), Pätzold (1994, 2003), Pilcher *et al.* (1990), Porter *et al.* (1996), Rasmussen & Anderton (2004), Ripley (1982), Roberts (1992), Robson (2000), Shirihai (1986a, 1986b, 1996, 1999), Smythies (1986), Snow & Perrins (1998), Stepanyan (1983, 1990), Stuart Baker (1926, 1935), Vaurie (1951a, 1959, 1972), Whistler (1932, 1936), Wu Yi *et al.* (1989), Yuan Chonggui *et al.* (1982), Yuan Hsiaowei (1996), Zhao Liang *et al.* (2002).

95. **Raso Lark**

Alauda razae

French: Alouette de Razo **German**: Rasolerche **Spanish**: Alondra de Razo
Other common names: Raso Short-toed Lark, Raso Skylark, Cape Verde Lark/Skylark, Raza Lark

Taxonomy. *Spizocorys razae* Alexander, 1898, Raso Island, Cape Verde Islands.
Previously placed variously in *Spizocorys*, *Calandrella* or a monotypic genus *Razocorys*. Behavioural traits, however, indicate that it is typical of present genus; recent genetic analyses suggest that it is very close to *A. arvensis*. Monotypic.
Distribution. Raso, in Cape Verde Is.



Descriptive notes. 12-13 cm; 18-28 g, male average 24 g, female average 20 g. Small lark with heavy, slightly decurved bill giving front-heavy appearance, relatively short wings (no obvious primary projection), short tail, small erectile crest, strong sexual size dimorphism. Has pale area around eye (sometimes slightly spectacled appearance), indistinct pale supercilium; greyish with dull dark streaks above; wings and tail darker, blackish, wing-coverts with pale tips, outer rectrix mostly white; throat white, rest of underparts pale creamy buff (whiter in worn plumage), breast streaked blackish; bill blue-grey, base of lower mandible whitish; legs dull flesh-coloured. Distinguished from *A. arvensis* by smaller size, longer and clearly larger bill, greyer plumage lacking rufous tones, in flight no white trailing edge of wing. Sexes alike in plumage; female significantly smaller than male in all measurements, wing average 80 mm (male 87 mm), bill 12·2 mm (male 14·6 mm). Bill length (especially of male) appears to vary seasonally, possibly through wear caused by digging. Juvenile has strong rufous tones, especially on ear-coverts and lower back, pale feather fringes above, breast markings more diffuse; very similar to juvenile *A. arvensis*. Voice. Male song, in flight or from ground, variations on a liquid "chirr-irr-ipp" or "chirru-dirru", given in bursts, with frequent intervals sometimes longer than song bursts, recalls that of *Galerida cristata*; simpler than song of *A. arvensis*, with more and longer gaps, but song during descent from flight faster, more complex and similar to latter's. Usual call "chirr-irr-ipp", like note of song flight.
Habitat. Found primarily on flat plain of decaying lava, mostly below 50 m. Strongly associated with dry streambeds (*ribeiras*) and scattered patches of sand, which support low vegetation after rain; also associated with grassy patches along tops of low cliffs on S coast of the island. Occasionally around rock pools at bottom of cliffs. In non-breeding season, a high proportion of population moves to a gravelly valley at E end of island.
Food and Feeding. Range of plant and insect species. In analyses of faecal samples of males during breeding season, all contained vegetable matter, c. 50% contained lepidopteran larvae. Other recorded items include seeds, beetles (Coleoptera) and marine gastropods; also takes discarded food scraps. Seen to chase small skinks (*Scincus*), although whether for food or to keep them away from nests is not known. Forages on ground. Much feeding involves use of the bill to excavate holes up to 10 cm deep in order to extract bulbs of the nutsedge *Cyperus bulbosus*; c. 3 minutes of digging required to yield one bulb, although dominant males increase the rate of food intake by displacing digging birds from holes, and in some places vigorously defend a number of holes; in sandy areas, ground sometimes littered with worked-out excavations. In gravel areas, feeds by pecking seeds or invertebrates from ground or from low vegetation, and by turning over small stones; also takes invertebrates, and scraps left by visiting fishermen, around rock pools. Males spend more time in digging than do females, possibly because of sexual differences in bill structure; difference between sexes in feeding strategy may have arisen as a means of partitioning resources in an austere environment. Occasionally drinks seawater from marine rock pools (no standing fresh water exists on Raso).
Breeding. Most nesting activity in Oct-Dec, following rainfall (which generally in Sept/Oct), but rain can fall at any time of year and nesting recorded in most months; conversely, long droughts can prevent breeding, sometimes for several successive years. Monogamous; male closely guards mate. Song-flighting male rises vertically to c. 30 m, hovers, descends steeply, singing throughout, display lasting on average 2 minutes, maximum 15 minutes in sample of 150, longest by unpaired males (which defend a territory, once two territories). Nest a deeply grass-lined scrape on ground, similar to that of *A. arvensis*, often under the low plant *Zygophyllum simplex*. Clutch 1-3 eggs; incubation by female alone, fed on nest by male, period at least 12 days; nestling period not documented; if nest preyed on, immediately begins a new one, sometimes using lining from original nest. Extremely high rate of nest predation, probably by the near-endemic gecko *Tarentola gigas*.
Movements. Resident; ranges widely during non-breeding season, although distances involved are small. No records away from Raso.
Status and Conservation. CRITICAL. Restricted-range species: present in Cape Verde Islands EBA. Has one of the smallest ranges of any bird species, confined to the single uninhabited island of Raso (7 km²), lying c. 20 km W of São Nicolau, in Cape Verde Is. May have been more widely distributed previously, when islands were joined together during periods of lower sea-level. The only lark on Raso. Total population extremely small, fluctuates in relation to rainfall, dropping to as few as ten pairs after prolonged droughts: in Oct 2001 estimated at c. 130 individuals, c. 66% of which males; total of 98 birds, only 30 of them females, in Jan 2003. Strongly male-dominated sex ratio perhaps explained by differences between males and females in feeding strategy. Despite the very small numbers, densities in favoured areas can be very high. Desertification is greatest threat to the species in the long term, as its population level is determined largely by rainfall. Potential introduction of cats or rats (*Rattus*) a further serious threat; although cats have been present on Raso in the past, and as recently as late 1990s, they do not appear to have established a breeding population. Development of tourist facilities on nearby São Nicolau and São Vicente is likely to result in increase in numbers of people visiting Raso, with resulting threats of disturbance, trampling and the accidental introduction of mammal predators. Raso is designated a national park, requiring visitors to apply for permission, although this rarely sought. The species is protected under Cape Verde law. Current conservation initiatives aim to increase capacity of Cape Verde authorities effectively to protect this lark and other important species in the archipelago.
Bibliography. Alexander (1898a, 1898b), Anon. (2003a, 2003c), Bannerman (1953), Borrow & Demey (2001), Bourne (1955, 1966), Burton (1971), Castell (1999), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Cramp (1988), Donald (2002), Donald *et al.* (2003), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Fraser (2004), García (1999), Green (1991), Hall (1963), van Harreveld (1985), den Hartog (1990), Hazevoet (1989a, 1995, 1999), King (1978/79), Ratcliffe *et al.* (1999), Stattersfield & Capper (2000).

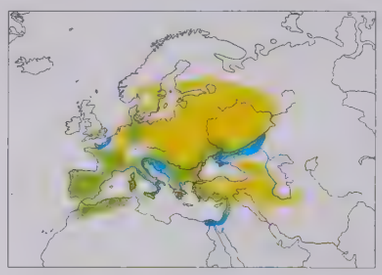
Genus *LULLULA* Kaup, 1829

96. **Woodlark**

Lullula arborea

French: Alouette lulu **German**: Heidelerche **Spanish**: Alondra Totovía

Taxonomy. *Alauda arborea* Linnaeus, 1758, Sweden.
Genus possibly better merged with Alauda, as structural and behavioural differences between the two probably insufficient to justify splitting them. Yellow-tinged (fresh plumage) birds from Romania described as race *flavescens* and similar but marginally smaller ones from Crete as *wettsteini*, both regarded as indistinguishable from *pallida*. Two subspecies recognized.
Subspecies and Distribution.
L. a. arborea (Linnaeus, 1758) - breeds from S Fennoscandia, S Britain, France and N Iberia E to W Russia, Ukraine, N Italy and N Balkans.
L. a. pallida (Zarudny, 1902) - S Europe and NW Africa E (including larger Mediterranean islands) to Turkey, Caucasus, Levant (S to N Israel), Iran and SW Turkmenistan.



Descriptive notes. 15 cm; 23-35 g. Medium-sized lark with relatively slender bill, long-ish broad wings and short tail (looking dumpy in flight), short erectile crest, distinctive plumage markings. Nominate race has prominent white supercilia meeting to form V-shape on nape, rufous ear-coverts bordered white below, dark moustachial and malar stripes; crown and upperparts rufous-buff, prominently streaked black, rump browner and unstreaked, secondary wing-coverts and tertials browner with pale tips and edges; flight-feathers darker brown, primary coverts black with broad white tips, alula mostly whitish; tail with brownish central pair of feathers, remainder mostly blackish with broad white tips, outer rectrix dark brown with narrow pale brown outer edge; whitish below, washed buff on breast and flanks, breast streaked black, flanks with indistinct narrow greyish streaks; bill brown, pinkish base of lower mandible; legs flesh-coloured. Sexes alike, female slightly smaller than male. Juvenile has distinct pale feathers fringes above (scaly-looking), breast markings spot-like. Race *pallida* is paler and greyer than nominate, less buff below. Voice. Male song, in flight or from ground or perch, including at night, a clear, rich and melodious series of descending and clearly accelerating flourishes, "tlee tlee-tlee" notes soon turning into faster mellower "tlu" notes and followed by few whistles and warbling trill; slower and richer than songs of sympatric larks. Call a liquid "tee-luee" or "ti-tluee".
Habitat. Variety of open and semi-open habitats on well-drained soils, with preference for acidic sandy soils. Prefers unmanaged or poorly managed habitats such as low-intensity or abandoned farmland, heathland, young forestry plantations (particularly conifers up to 5 years old), recently felled woodland, open woodland and scrub, orchards, steppes, woodland edges and clearings, wooded coastal dunes and parkland; occurs rarely in more intensive agricultural areas, but no apparent competion with *Alauda arvensis* or other farmland larks. Requires bare ground or very sparse short vegetation for feeding, longer vegetation for nesting, and scattered perches. Sea-level to c. 2000 m; to 3000 m in NW Africa (High Atlas). Distribution closely related to warmer climates (more so than is the case with sympatric alaudids), primarily between 17°C and 31°C summer isotherms; areas with average minimum winter temperature below 1°C generally avoided.
Food and Feeding. Predominantly invertebrates during summer, vegetable matter in winter. Possibly more generally omnivorous throughout year than *Alauda* species; even in summer, adults consume considerable quantities of leaves and seeds of grasses and broadleaf plants. Chicks fed entirely with invertebrates, with lepidopteran caterpillars particularly important, and beetles (Coleoptera), flies (Diptera) and spiders also widely taken. Forages entirely on the ground, singly or in pairs; sometimes small groups in non-breeding season. Picks items from soil surface, also from low plants; relatively little digging. Brood-feeding adults forage mostly at average of c. 120 m from nest, but up to 400 m recorded.
Breeding. Mar-Jul, exceptionally to Aug; 2-3 broods. Monogamous; solitary and territorial. Male has well-developed butterfly-like song flight, climbs in spirals to c. 100-150 m, circles while rising and falling, or drifts in wide arcs, descends slowly, sometimes with final plummet, to perch or ground. Nest a deep depression in ground, usually beneath shade of a bush or tree stump, lined with leaves, pine needles and moss beneath top layer of finer grasses; often several scrapes dug by both sexes, but final nest built entirely by female. Clutch 2-6 eggs, normally 3-5; incubation by female alone, period 12-15 days; chicks fed by both parents, leave nest at 10-12 days, occasionally earlier if disturbed, fledge at c. 15-16 days; young remain in vicinity of parents during rearing of second brood, all forming small flock in autumn.
Movements. Resident, with short-distance dispersal, in W & S of range. Partial migrant in C Europe, migratory in N & E. Autumn passage across Europe mid-Oct to late Oct; ringing recoveries suggest that high proportion of N populations winter in SW France. Returning migrants reach Netherlands in late Feb, but not until Apr in Germany. Accidental in Faeroes, Ireland, Libya and Kuwait.
Status and Conservation. Not globally threatened. Fairly common; rather sparsely distributed, and often local. Total European population in 1990s estimated at between 900,000 and c. 3,000,000 pairs, and probably in the region of 1,500,000 pairs. Great majority of these in Spain (c. 850,000 pairs) and Portugal (at least 300,000), where average density c. 2·4 pairs/km²; densities far lower (c. 0·1-0·3 pairs/km²) in other countries, none of which regularly holds more than 50,000 pairs, and where the preferred heterogeneous habitats contain much vegetation that is too tall to be exploited for foraging. Apparent declines and range contractions recorded in some regions, and listed by BirdLife International as a "Species of Conservation Concern in Europe"; general tendency, however, for numbers to fluctuate quite markedly, and population levels partly dependent on winter weather, but habitat loss also a factor. Conversely, increases in the area of young coniferous forestry plantations, as well as creation of further suitable habitat in storm-felled mature woodland, have led to local increases and range expansion in some countries, especially in W Europe; successive mild winters in N, W & C Europe usually followed by marked rise in breeding numbers.
Bibliography. Adamian & Klem (1999), Bijlsma, van Dijk *et al.* (1988), Bijlsma, Lensink & Post (1985), Bowden (1990), Bowden & Green (1992), Bowden & Hoblyn (1990), Bruns (1994), Cramp (1988), Daunicht (1985), Dementiev *et al.* (1970), Étchécopar & Hüe (1964), Godlinsky (1996c), Goriup (1988a), Gustafsson & Wahlén

(1985), Hagemeijer & Blair (1997), Hanssen (1984), Harrison (1961), Harrison & Forster (1959), Heath (1994), Heath *et al.* (2000), Heim de Balsac (1936), Heinroth & Steinbacher (1952), Hoffman (1951), Hüe & Étchécopar (1970), Jewels & Kendall (1992), Kieckbusch & Romahn (2000), Klingenberg (1982), Koffán (1960), Kriegbaum & Richter (1996), Labitte (1958), Ledant & Jacob (1980), Mackowicz (1970), Maes *et al.* (1984), Meadows & Symens (1996), Meeus (1982), Messlinger (1999), Moritz (1989), Myklebust (2000), Nikander (1994), Osiek & Hustings (1994), Pätzold (1971, 1986), Ragger (2000), Rasmussen (1981), Richter (1998), Schäfer & Vogel (2000), Sermet (1987), Shirihai (1996), Singer & Nicolai (1990), Sitters (1986), Sitters *et al.* (1996), Snow & Perrins, Stahl (2001), Stepanyan (1990), Südbeck (1981), Tellería *et al.* (1999), Thévenot *et al.* (2003), Tieleman & Williams (2002a), Tieleman, Williams & Buschur (2002), Tieleman, Williams, Buschur & Brown (2003), Valkama & Lehikoinen (1994), Vaurie (1959), Virtanen (1991), Wotton (2000), Wotton & Gillings (2000).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family HIRUNDINIDAE (SWALLOWS AND MARTINS)



- Small to medium-sized aerial-feeding passerines, with long wings and streamlined body; tail forked in many species.
- 11-25 cm.



- Cosmopolitan.
- Wide variety of habitats, from semi-arid areas to forest, often near water.
- 19 genera, 83 species, 210 taxa.
- 5 species threatened; none extinct since 1600.

Systematics

Swallows and martins form a distinctive family, the 83 members of which are morphologically very similar to each other (see Morphological Aspects) and unlike all other passerines. This evolutionary conservatism is a result of the specialized lifestyle of the group, namely, the adaptations of swallows and martins to foraging on aerial insects, and it has made the establishing of relationships, both with other passerine groups and within the family, problematic. DNA-DNA hybridization studies, however, indicate that the closest relatives of the Hirundinidae are the Old World warbler-babbler group, including the sylviid warblers, the babblers (Timaliidae), the white-eyes (Zosteropidae), the tits and chickadees (Paridae), and the long-tailed tits (Aegithalidae), diverging some 50 million years ago. There is little fossil evidence of hirundinids, but a species known as *Hirundo aprica*, resembling the Barn Swallow (*Hirundo rustica*), was present 3·5-3·3 million years ago in North America.

Divisions within the family have long been uncertain, although two subfamilies are clearly recognized. The two species of river martin, forming the subfamily Pseudochelidoninae, are stocky swallows with a large syrinx and half bronchial rings; they seem to be relict species, occurring in Africa and South-East Asia, of a group that probably once had a much wider distribution. How closely related they are to each other is not clear. The White-eyed River Martin (*Pseudochelidon sirintarae*) has sometimes been placed in its own genus, *Eurochelidon*, but the differences between this species and the African River Martin (*Pseudochelidon eurystomina*), such as the former's longer and wider bill, are relatively minor.

All other members of the family are placed in the subfamily Hirundininae, the more typical elegant swallows and martins, which have more or less complete bronchial rings. In the past, many genera within this much larger subfamily have been created on the basis of generally small differences, such as the presence of feathers on the legs or the shape of the nostrils; these were often trivial and variable characters, however, and not helpful in indicating overall relationships. R. B. Sharpe and C. W. Wyatt, in their nineteenth-century monograph of the family, recognized twelve genera, but 26 had been created by the early twentieth century. In 1943, E. Mayr and J. Bond, in the first main treatment of the family, used nesting habits and colour patterns, as well as geography, to group many of these genera together. Some, however, have since been resurrected and further genera have been proposed. Recent DNA-DNA hybridization and cytochrome *b* studies of 17 species, undertaken by F. H. Sheldon and D. W. Winkler, have largely supported Mayr and Bond's approach, although these modern, molecular techniques have not resolved all of the relationships within the family and there is a clear need for more species to be examined. These studies do, however, indicate a division of the subfamily Hirundininae into three groups: the African saw-wings in the genus *Psalidoprocne*, a "core" martin group, and *Hirundo* and its allies. Nevertheless, despite these clear groupings of species, hirundines are very similar to each other genetically, especially when compared with some other groups, such as tits and chickadees, which have only a few



Subdivision of the Hirundinidae

[Figure: Hilary Burn]

All hirundines have aerodynamically efficient bodies, with a short neck, long, tapered wings and short legs. Tail structure varies and provides a rather loose division in terms of vernacular names. Species with short, squared-off or shallowly forked tails, such as the ***Grey-breasted Martin****, are known as martins, whilst those with deeply forked tails and, often, elongated outer tail feathers, such as the* ***Lesser Striped Swallow****, are known as swallows. There are, however, numerous exceptions!*

[Left: *Progne chalybea macrorhamphus*, Itatiaia National Park, Rio de Janeiro, Brazil. Photo: Edson Endrigo

Right: *Cecropis abyssinica unitatis*, Kruger National Park, South Africa. Photo: Heinri van den Berg/ Bios]





genera. They also have similar lifestyles, foraging and feeding in similar ways. The most notable differences among them with regard to ecology and behaviour are in nest type, in the size and swarming propensity of their prey, and in the degree of sociality while breeding.

The African saw-wings form a group of distinctive, dark-coloured glossy or brown swallows, all with a rough or "serrated" edge to the outer primary (see Morphological Aspects) and most having a deeply forked tail. Five species are generally recognized, four of which nest in burrows and one on ledges. It is typical of polytypic genera in the Hirundinidae for some of the species to be very similar to one or more of their congeners, and, accordingly, four of the saw-wings are treated as forming two superspecies. The saw-wing genus, however, is poorly known, and further work is required in order to sort out the relationships among the numerous forms. As is often the case in this family, the saw-wing races are not very distinctive, varying only slightly in shade of coloration, in size or in tail shape. Moreover, the non-breeding and breeding ranges are also little known, making it difficult to draw racial or species limits. Despite this, eight of the twelve subspecies of the Black Saw-wing (*Psalidoprocne pristoptera*) have often been treated as full species, as there are areas of range overlap within which apparently little interbreeding occurs.

The core martin group includes a large number of diverse taxa. The small Grey-rumped Swallow (*Pseudhirundo griseopyga*) of Africa, once included in the genus *Hirundo* because of its coloration, is closely related to the White-backed Swallow (*Cheramoeca leucosterna*) of Australia, but is a sister-taxon to the other members of the core martin group. Both species have a deeply forked tail and both nest in burrows. The genus *Phedina* also has a disjunct distribution, comprising two martins with brown upperparts, striped underparts and a square tail, one breeding in Madagascar and the Mascarene Islands and the other in the lower Congo Basin. The nesting habits of the two differ, however, the Mascarene Martin (*Phedina borbonica*) building an open cup of plant material and Brazza's Martin (*Phedina brazzae*) using burrows, and the latter has sometimes, therefore, been placed in a monotypic genus, *Phedinopsis*. The brown-and-white sand martins in the genus *Riparia*, which excavate nesting burrows, are more widespread, with four species in the Old World and one, the Collared Sand Martin (*Riparia riparia*), in both the New and the Old Worlds. As is common among the Hirundinidae, the variation among the sand martins in such characters as size and coloration is slight and mainly clinal, with subspecies grading into one another, making not only racial distinctions but also those between races and species difficult. Until recently, all sand martins in Eurasia were treated as representing one species, but two population types that differ in both appearance and voice have been found breeding sympatrically, and these are now considered to be separate species, the Collared Sand Martin and the Pale Sand Martin (*Riparia diluta*). The Banded Martin (*Riparia cincta*) of Africa stands out from the rest of this group in being larger, with a squarer tail and a more solitary lifestyle. It has sometimes been placed in its own genus, *Neophedina*, but cytochrome *b* data suggest that *riparia* and *cincta* are, indeed, sister-taxa.

In contrast, all of the remaining members of the core martin group are found only in the New World and all use existing cavities as nest-sites. Their relationships, however, are poorly known, as are, in many cases, details of their biology. The nine species of *Tachycineta* are glossy blue-backed or green-backed swallows with white underparts. A century ago, R. Ridgway divided them among four genera, whereas, 70 years later, R. K. Brooke proposed a single genus with two subgenera. More recently, comparison of DNA sequences also suggests a single genus, with two clades corresponding to these subgenera. One clade is a distinctive group of five white-rumped species which replace each other geographically from north to south in Central and South America. These are the Mangrove Swallow (*Tachycineta albilinea*), the Tumbes Swallow (*Tachycineta stolzmanni*), the White-winged Swallow (*Tachycineta albiventer*), the White-rumped Swallow (*Tachycineta leucorrhoa*) and the Chilean Swallow (*Tachycineta meyeni*). The first three and the last two, respectively, are considered to form two superspecies. The other clade consists of two North American species, the Tree Swallow (*Tachycineta bicolor*) and the Violet-green Swallow (*Tachycineta thalassina*), and two from the Caribbean, the Golden (*Tachycineta euchrysea*) and the Bahama Swallows (*Tachycineta cyaneoviridis*); the Violet-green Swallow is closest to the last two, despite their geographical separation, with the Tree Swallow a sister-taxon to them.

Where populations are geographically isolated, it is sometimes not clear whether they represent races of a particular species



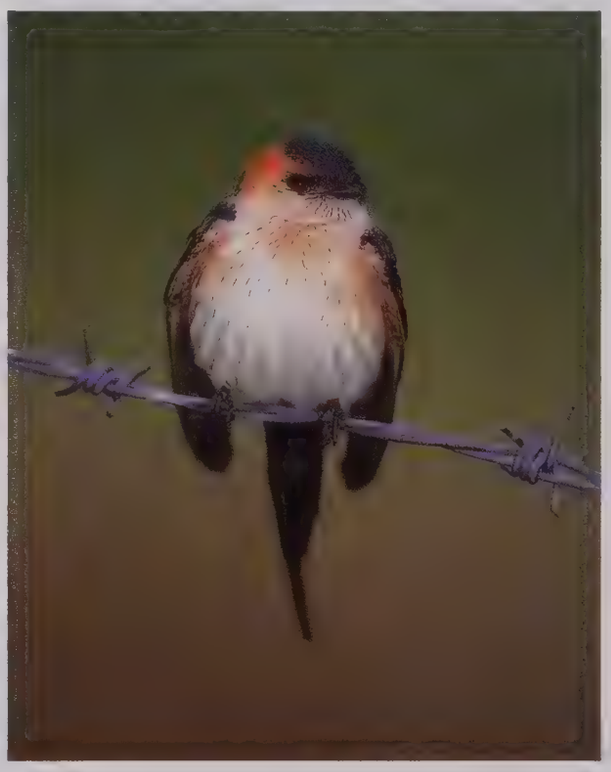
Barn Swallows *demonstrate many of the features that make the family such successful aerial hunters. The wings are long in relation to their area and their ratio of body weight to wing area is low, these features allowing exceptional manoeuvrability at low speeds. Such a wing shape also allows for frequent bouts of gliding whilst foraging, reducing energy demands and boosting efficiency. Equally important is the forked tail which provides lift and plays a key role in manoeuvring, in rate of climb, and in acceleration. Wing and tail shape are adapted to suit the flying style of individual species, and this in turn reflects their prey preferences. The forked tail of this species allows for very tight turns during the pursuit of prey.*

[*Hirundo rustica rustica*, Norwich, England. Photo: Tony Tilford]

or constitute separate species. This is a recurring difficulty in the Hirundinidae, many forms of which are too poorly known for their taxonomic status to be resolved. The Mangrove Swallow is a good illustration of the problem. It occurs in Middle America to as far south as Panama, but a century ago a population in Peru and Ecuador was described as a subspecies of it, apparently differing in small respects such as lacking a white supraloral streak, having greyer underparts and being slightly smaller. The large geographical distance between the two forms would suggest that they are distinct species, but only recently has evidence in support of this come to light. On the basis of nest structure, vocalizations, morphology and cytochrome *b* data, the South American form is now treated as a species in its own right, the Tumbes Swallow.

The relationships of the various species and subspecies of the large *Progne* martins are still uncertain and require further work. The 14 taxa are similar in morphology and behaviour, and they are difficult to distinguish in the field. Several forms are regarded variously as subspecies or as full species by different authors. The Cuban (*Progne cryptoleuca*) and the Sinaloa Martins (*Progne sinaloae*), for example, are sometimes treated as full species, sometimes as races of the Caribbean Martin (*Progne dominicensis*) and sometimes as races of the Purple Martin (*Progne subis*). Likewise, the Galapagos Martin (*Progne modesta*), the Peruvian Martin (*Progne murphyi*) and the Southern Martin (*Progne elegans*) have been considered conspecific by many authors. Of the nine species currently recognized, eight are thought to form a superspecies. The ninth species, the Brown-chested Martin (*Progne tapera*), differs from the others in having brown, rather than blue, plumage, a slender bill, weaker feet, a less deeply forked tail, and greater feathering on the tarsus, as well as in the fact that the sexes are alike. Because of these differences it is often placed in a separate, monotypic genus, *Phaeoprogne*, but DNA-DNA hybridization and cytochrome *b* data suggest a particularly close relationship with the Grey-breasted Martin (*Progne chalybea*).

The genera *Notiochelidon* and *Haplochelidon* are closely related to *Atticora* and *Neochelidon*, which are also sister-taxa. The four species of *Notiochelidon* are blue-and-white or brown-and-white montane swallows, occurring at different altitudes; two of them, the Blue-and-white Swallow (*Notiochelidon cyanoleuca*) and the Pale-footed Swallow (*Notiochelidon flavipes*), are often put in a separate genus, *Pygochelidon*. Now treated in a monotypic genus, the Andean Swallow (*Haplochelidon andecola*) was for a long time thought to be a type of cliff swallow (*Petrochelidon*/*Hirundo*), although its plumage coloration differs in lacking red, and it does not build a mud nest; DNA-DNA hybridization studies, however, strongly indicate that it belongs in the core martin group along with *Notiochelidon*, *Atticora* and *Neochelidon*. The two species of *Atticora* are glossy blue-black and white, with a long forked tail, and occur along rivers in South America, while the closely related White-thighed Swallow (*Neochelidon tibialis*),



Red-rumped Swallows *frequently perch, which can facilitate close examination of their typically weak feet. Despite their feet being primarily adapted for perching, many hirundines are also at home on the ground, which they mostly visit to collect nesting material, grit and, occasionally, insects. In the subfamily Hirundininae, which includes the Red-rumped Swallow and the vast majority of the hirundines, the legs are typically short and weakly muscled. This shared trait, along with many other examples, reflects the unusual level of genetic similarity across the subfamily.*

[*Cecropis daurica rufula*, Lesbos, Greece. Photo: David Tipling/ Windrush]



Tail morphology generally relates directly to hunting technique and prey type, and in some species it also plays a part in mate selection. For some species with elongated outer tail feathers, or streamers, it has been shown that tail length operates as a visible indicator of breeding fitness: males with longer tails are more attractive to females. It is tempting to speculate that in the ***Wire-tailed Swallow*** *the primary function of the very thin filaments of the outer tail feathers is to telegraph this sexual message, as the rest of the tail is rather short and square-cut. Streamers are usually present in species with longer, more forked tails, clearly related to aerodynamics.*

[*Hirundo smithii filifera*, Keoladeo Ghana National Park, India. Photo: Manfred Pfefferle]

another brownish South American hirundinid, is the sole member of its genus.

Concluding the core martin group are three rather drab brownish swallows with a more or less square tail which nest in burrows. The rough-wings (*Stelgidopteryx*) were initially considered to consist of several species, but were later regarded as constituting just one species with many races. As with the sand martins in the genus *Riparia*, variation in characters tends to be clinal. The discovery of two different populations of rough-wings breeding in the same area in Central America, however, led to the conclusion that there were two separate species, the Southern Rough-winged Swallow (*Stelgidopteryx ruficollis*) and the Northern Rough-winged Swallow (*Stelgidopteryx serripennis*). The monotypic Neotropical genus *Alopochelidon* is sometimes merged with *Stelgidopteryx*, but the Tawny-headed Swallow (*Alopochelidon fucata*) lacks the latter's "serrated" edge of the outer primary.

Hirundo and its allies, the last of the three groups of the Hirundininae, comprises the species that build mud nests. Many have glossy blue upperparts, with red on the head, rump or underparts, and white patches in the often forked tail. DNA-DNA hybridization studies and cytochrome *b* data have indicated that *Hirundo* and *Ptyonoprogne* are sister-taxa and that *Delichon*, *Cecropis* and *Petrochelidon* are monophyletic, with *Cecropis* being close to *Petrochelidon*. The two last-mentioned genera, as well as *Ptyonoprogne*, have often been subsumed in the genus *Hirundo*, and a merging of *Delichon* with *Hirundo* has also been suggested, but Sheldon and Winkler's studies support the retention of, at least, *Delichon*, *Cecropis* and *Petrochelidon*. That all the mud-nest builders are closely related is reflected in the occurrence of hybridization between species of different genera, with hybrids between Barn Swallows and Northern House Martins (*Delichon urbicum*) and between Barn Swallows and Cave Swallows (*Petrochelidon fulva*) being particularly frequent. Nevertheless, each of the five genera within the *Hirundo* clade comprises a distinctive group of swallows.

With a total of 14 species, all of which build open cup-nests, *Hirundo* is the largest genus in the family. This genus can be further divided into several natural groups. The seven species of the "barn swallow group" have glossy blue upperparts, pale underparts, and rufous on the forehead and, often, on the throat. They are mostly African, but the Welcome Swallow (*Hirundo neoxena*) occurs in Australasia and the Pacific Swallow (*Hirundo tahitica*) from south Asia eastwards to the South Pacific islands, while the Barn Swallow itself breeds right across the Northern Hemisphere and has recently been found nesting also south of the equator, in Argentina. The Welcome and Pacific Swallows are often treated as conspecific. Even in the case of the Barn Swallow, probably one of the best-known bird species in the world, relationships between the various subspecies are not yet understood. Further work is needed, in particular to assess whether the North American and the Eurasian forms, which differ, for example, in incubation behaviour, as well as genetically, constitute separate species. Apart from the Wire-tailed Swallow (*Hirundo smithii*), which is found in Africa and Asia, the remaining *Hirundo* species are all restricted to the Afrotropical Region. Among these, two distinctive groups are comprised by, respectively, the Pied-winged (*Hirundo leucosoma*), White-tailed (*Hirundo megaensis*) and Pearl-breasted Swallows (*Hirundo dimidiata*), which lack any rufous coloration, and the Montane Blue (*Hirundo atrocaerulea*) and Black-and-rufous Swallows (*Hirundo nigrorufa*), both of which build their nests with mud and plant material combined, rather than using mud alone (see Breeding).

The three crag martins (*Ptyonoprogne*) form a group of dull brown, montane hirundines which, like the *Hirundo* swallows, construct an open cup-nest. One species occurs in southern Europe, North Africa and Asia, another is found in Africa, the Middle East and south-west Asia, and the third is resident in southern Asia alone. They provide a further example of the difficulty of determining the level at which various taxa in this family should be treated. The northern races of the Rock Martin (*Ptyonoprogne fuligula*) are often considered as constituting a separate species under the name "*Ptyonoprogne obsoleta*", usually referred to as the Pale Crag Martin, but the variation in coloration and size among the Rock Martin's 13 subspecies is largely clinal and the races intergrade with one another. Further, all three currently recognized species of *Ptyonoprogne* have been treated as conspecific by some authors, but, as their breeding ranges overlap, this proposition is unlikely to be tenable.

Breeding in Europe and Asia are three rather distinctive hirundines, the house martins (*Delichon*), which are blue and

white and have a squarish tail. The house martins build an enclosed nest, while the swallows in the genera *Cecropis* and *Petrochelidon* go further in adding a tunnel. *Cecropis* is represented by four African species, two more in south-eastern Asia and one in Europe, Africa and Asia. These exhibit considerable amounts of rufous in the plumage, mostly on the head, neck and rump, often combined with streaking on the underparts, and have a deeply forked tail. The most widespread of the seven species, the Red-rumped Swallow (*Cecropis daurica*), forms a superspecies with the two solely Asian ones, which have often been treated as conspecific; indeed, all three have sometimes been considered to represent just a single species.

The final genus in the family, *Petrochelidon*, is more cosmopolitan, with five species in the Afrotropics, three in the Americas, one in India and two in Australia. Apart from the wholly brown-plumaged Forest Swallow (*Petrochelidon fuliginosa*), they, too, have rufous or buffy coloration on the head and rump, but they have a square-ended or only shallowly forked tail. It is possible, however, that two of the eleven species do not belong to this group. The Forest Swallow differs from the others not only in its general coloration, but also in its bill shape, its solitary nesting habits, the shape of its nest, and its usually unspotted, white eggs, although these characteristics may be adaptations to its forest environment. Similarly, the Tree Martin (*Petrochelidon nigricans*) differs from typical *Petrochelidon* species in, for example, the fact that it does not build an enclosed mud nest with a tunnel. Further research may demonstrate that both the Forest Swallow and the Tree Martin should be placed elsewhere, either in other existing genera or, possibly, in new, monotypic genera. The taxonomy of this genus at the subspecific level has also proved to be complex. Until recently, the Cave Swallow was generally treated as comprising two main populations which were widely separated geographically, one breeding in the southern United States, Mexico and the Caribbean, and the other resident in south-west Ecuador and west Peru. As demonstrated in 2000 by J. J. Kirchman and co-workers, however, cytochrome *b* data suggest that two species are involved, the Cave Swallow in the north and the Chestnut-collared Swallow (*Petrochelidon rufocollaris*) in the Neotropics. In addition, the northern population, the Cave Swallow, appears to be represented by two clades, forming eastern and western populations. Clearly, more research is required in order to determine the best way of treating this group of taxa.

Mayr and Bond, in their 1943 treatment, considered that cavity-nesters were the most primitive hirundines, but the recent DNA studies, in contrast, indicate that, for this family, excavation of a hole is the ancestral way of creating a nest, occurring among the African saw-wings and some of the core martin group, such as *Pseudhirundo*, *Cheramoeca* and *Riparia*, as well as in the river martins in the subfamily Pseudochelidoninae and among the related family Paridae. Species that use holes and those that make nests of mud may be derived independently from nest-excavators. The strategy of taking over an old hole or nest as a nesting option seems to have arisen independently several times among hirundines. The majority of the martin group use pre-existing holes, whereas *Hirundo* and allied species make nests from mud. Even so, some burrowing and mud-building species occasionally nest in old holes or nests, and the Mountain Saw-wing (*Psalidoprocne fuliginosa*), the Mascarene Martin and the Tree Martin, all members of typically burrowing or mud-building genera, usually do so. In addition, the Black Saw-wing will sometimes use a pre-existing hole, perhaps just enlarging it, and Mosque Swallows (*Cecropis senegalensis*) sometimes take over nests of other swallows, build them up and add a tunnel entrance. In contrast to hole-nesting, both burrowing and mud-nesting appear to have evolved only once, with different species making the burrow or nest in basically similar ways (see Breeding). Burrowing arose early in the evolution of the family, whereas mud-nest building developed relatively recently with the *Hirundo* clade; the method of construction of pure mud nests by this latter group is unique among birds. As intimated above, there are three types of mud nest, of which the open cup-nest of *Hirundo* itself and of *Ptyonoprogne* is likely to be the most primitive. In the second type, that of the three *Delichon* species, the walls of the nest are built up so as to close the structure, leaving just a small entrance hole. The third type of mud nest, the retort-shaped nest with tunnel entrance constructed by *Cecropis* and *Petrochelidon*, is probably the most recently evolved.

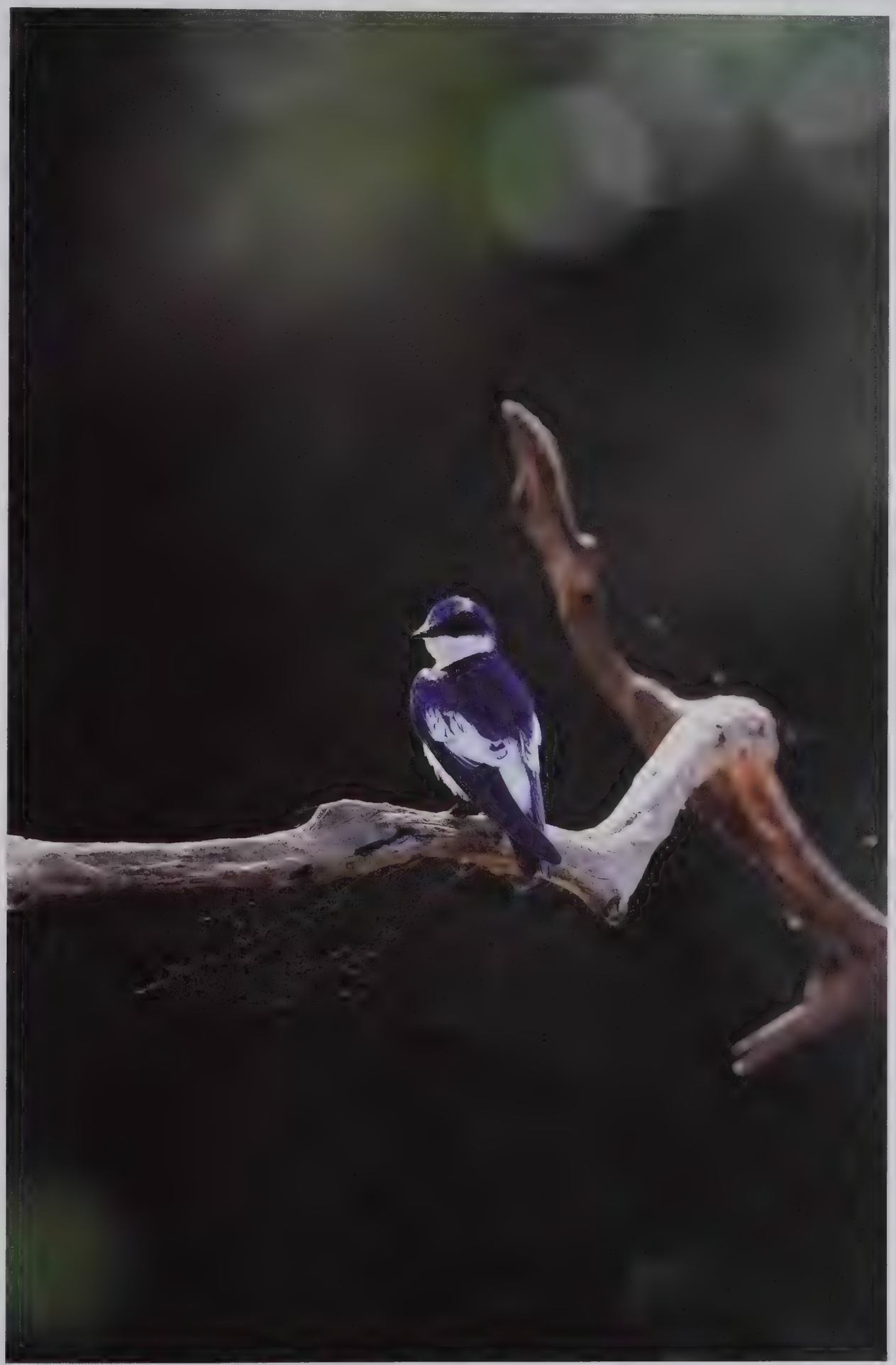
Morphological Aspects

Hirundinids are small to medium-sized passerines. The smallest, such as the White-thighed Swallow, weigh about 10 g and the largest New World martins over 60 g. They are all specialist aerial insectivores, foraging by pursuing insects in flight, and they are superbly adapted to this way of life. The various species in the subfamily Hirundininae have a streamlined body with a short neck, long, pointed wings, short legs with small, weak feet, and reduced leg muscles compared with other passerines; they also possess a short, broad bill. Many have a forked tail, and on some species the outermost tail feathers are elongated and narrowed to form streamers. Incidentally, the hirundines with a square-ended or shallowly forked tail are often referred to as martins, and those with an elongated tail as swallows, but there is no hard and fast rule in these designations; *Riparia riparia*, for example, is commonly known as the "Bank Swallow" in the Americas and as the



*The **Welcome Swallow** has a plumage pattern typical of a number of hirundines. Most show dark upperparts and pale underparts, and many have a striking pale or rufous forehead, throat, breastband and, occasionally, rump. Sexual dimorphism is not marked in hirundines, females tending to be slightly duller than males and, in species with tail streamers, to have shorter tails.*

[*Hirundo neoxena*, Australia.
Photo: Cyril Ruoso/Bios]



The distribution of the ***White-winged Swallow*** *is closely tied to open areas in close proximity to favoured wetland habitats in the lowlands, and the species is often observed perched on dead snags over rivers and along the margins of lakes and reservoirs. It also frequents mangroves, beaches and seasonally flooded grassland and savanna. Hirundines have evolved to occupy most of the naturally occurring open and semi-open habitats around the globe and they also use a large proportion of man-made habitats. Wetland species, such as the White-winged Swallow, readily forage over sewage works and wet pastures but other species such as the Barn Swallow* (Hirundo rustica) *are even able to forage and breed in busy urban environments. Hirundine breeding habitats require a plentiful supply of two things: prey and suitable nest-sites. Nest-site requirements differ throughout the family. Some species, such as the* Tachycineta *swallows, utilize natural or artificial cavities, and to a certain extent their distribution and population numbers are dictated by the availability of suitable nest-sites. The remaining species avoid this potential limitation by constructing their own nesting cavities of mud or excavating their own burrows. Such nests are situated on a variety of substrates from natural examples, such as cliffs and riverbanks, to man-made habitats, such as bridges and buildings. It is those hirundines that build mud-nests, notably the very successful Barn Swallow, that are most closely associated with human habitation.*

[*Tachycineta albiventer*, Aquidauana, Mato Grosso do Sul, Brazil. Photo: Edson Endrigo]



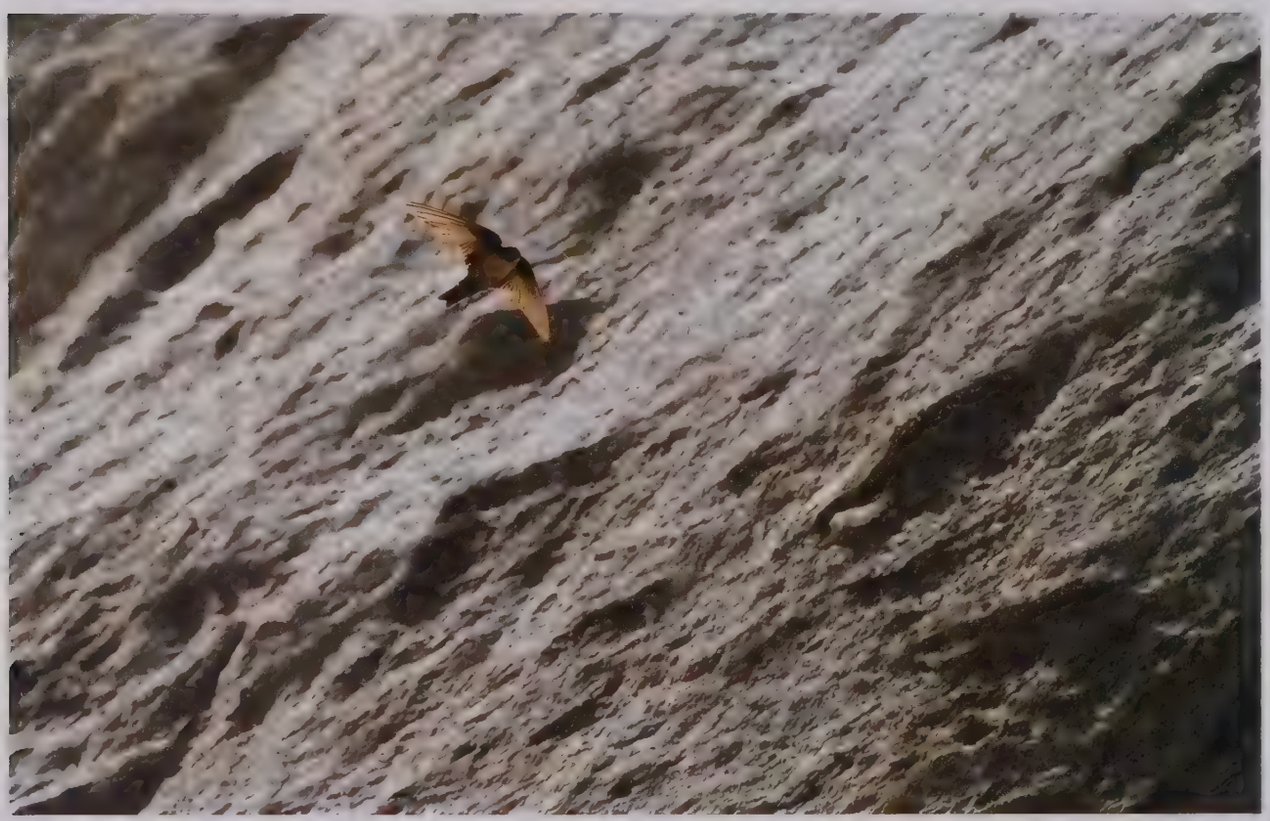
*The **Mosque Swallow** is found virtually throughout sub-Saharan Africa, where it occupies a variety of open and semi-open habitats including cultivated areas, riparian corridors, forest clearings, woodland, bush, grassland and, to a lesser extent, areas close to human habitation. Mosque Swallows invariably build a mud-nest but also occasionally modify an existing cavity or repair old nests. No doubt, this flexibility regarding nest-site selection, associated with the species's broad range of foraging habitats, explains its large, and expanding, geographical range. The genus* Cecropis *is often lumped into* Hirundo *but recent genetic research supports their separation.*

[*Cecropis senegalensis saturatior*, Ethiopia. Photo: Roland Seitre]

Collared Sand Martin elsewhere. The tail has twelve rectrices. The loral feathers are directed forwards, and some species have rictal bristles. The wings have ten primaries, the outermost being reduced. The tarsi are short, with a ridged rear surface; the toes and tarsi sometimes have feathers, and the front toes are more or less united at the base. The bill, the eyes and the legs and feet are generally dark brown or black. Internally, the syrinx has more or less complete bronchial rings. The palate is broad, and the tongue tapers to a bifid tip.

The two river martins that make up the subfamily Pseudochelidoninae are more stocky, with a relatively large yellow or orange-red bill and robust, pinkish legs and feet. They have a large syrinx with half bronchial rings and a large membrane the length of the bronchial tubes. Their leg muscles are also less reduced than those of the Hirundininae.

In flight, the long wings are characteristic of this family, although they resemble the more sickle-shaped wings of the convergent swifts (Apodidae). The high aspect ratio, with long wing-



*The **Eurasian Crag Martin** is found throughout the Palearctic, where it breeds mainly in mountainous regions and forages along cliff faces and other rocky areas, and occasionally over adjacent habitats. It is found from sea-level to over 4000 metres but mostly occurs in medium-altitude alpine valleys. This species forages by exploiting updraughts along cliff faces, flying close to them and snatching flushed insects. Recently the species has started to utilize man-made structures for nesting, and this has allowed a spread into the lowlands. During the winter, birds migrate or drop in altitude to make use of a wider range of lowland habitats including farmland, meadows, rocky coasts and wetlands.*

[*Ptyonoprogne rupestris*, Turkey. Photo: Lasse J. Laine/ Windrush]



*Not all hirundines have broad ecological requirements that allow them to make use of a wide range of habitats. Some are extremely specialized, like the poorly known **White-banded Swallow**, which is restricted to the upper reaches of forested lowland rivers in northern South America. This species forages low over the water and occasionally over the adjacent forest, and it may avoid competition with sympatric hirundines by feeding much closer to the surface of the water or vegetation. Nests are situated in holes and burrows in the riverbanks; it is not known whether this species is capable of excavating its own burrow or simply relies on taking over those of other species.*

[*Atticora fasciata*, Alta Floresta, Mato Grosso, Brazil. Photo: Edson Endrigo]

span in relation to wing area, and the low ratio of body weight to wing area (low wing-loading) allow the swallows and martins to fly slowly when turning to catch insects. The wing shape is also advantageous for gliding, an energetically inexpensive method of flying and one frequently practised by hirundines. Together, these features explain the relatively low flight costs of hirundines, which are 49-73% lower than those of other passerines of the same size. Although swallows are often considered to fly fast, they usually clock in at no more than about 30-40 km per hour during foraging, reaching up to about 50-65 km per hour when travelling between sites or on migration. In two genera, *Psalidoprocne* and *Stelgidopteryx*, the male's outer primary has a rough outer edge, caused by the barbs being recurved to form minute hooklets. The function of this serration is not known, but it may produce a sound used during a territorial or courtship display.

Also vital during aerial manoeuvres is the more or less forked tail, which the bird can spread wide, raise, lower or twist in order



*The enigmatic and highly specialized **African River Martin** is found along forested rivers and in coastal savanna in Central Africa, where it nests in large colonies on riverine sandbars, sand dunes and other littoral habitats. Outside the breeding season, birds roost in reedbeds and other forms of emergent wetland vegetation. The African River Martin is a member of the subfamily Pseudochelidoninae, which contains just two species that possibly represent relicts of a formerly more widespread group of birds. This subfamily differs from other hirundines by having a large syrinx and half (not complete) bronchial rings.*

[*Pseudochelidon eurystomina*, Gamba, Gabon. Photo: Michel Gunther/ Bios]



*Over most of its enormous range the **Barn Swallow** is so closely tied to rural and urban environments that it could be considered a commensal of man. In Europe and North America it is a rural species, closely associated with pastures and farmyards, especially those used by cattle, and in such situations nests are often placed in barns and other outbuildings. Elsewhere, in North Africa and Asia, the Barn Swallow has invaded our cities and towns, and nowadays few nests of this species are sited in natural locations, such as cliffs or tree cavities. Instead most nests are placed on man-made structures, such as buildings, bridges and culverts, and this trait must have contributed greatly to its success. However, recent declines have been noted across parts of its range. These are attributed to agricultural intensification and other changes in policy which have effectively removed cattle from the landscape and caused declines in the quality of farmland habitats.*

[*Hirundo rustica rustica*, Somerset, England. Photo: John Daniels/ Ardea]

to slow down or turn. The tail, particularly the leading edges formed by the outer rectrices, provides lift, and it also influences manoeuvrability, rate of climb and acceleration. Hirundinids differ in the fork depth of the tail and in the presence or absence of streamers. In part, this is related to the type of insect that they hunt. Species, such as the Barn Swallow, that chase large fast-flying insects and have to change direction frequently, have long outer tail feathers which provide more lift and enable the bird to turn tightly. Elongated outer rectrices, however, also play a part in the acquisition of a mate, for studies have demonstrated that long-tailed male Barn Swallows are more attractive to females than are short-tailed ones (see Breeding). Interestingly, hirundines possessing these tail-streamers are sexually dimorphic, with males having a longer tail than that of females, the outer rectrices sometimes so elongated and tapered that they appear wire-like. An extreme example is the Montane Blue Swallow, males of which have a spindly outer tail averaging 135 mm in length, compared with the female's 69-mm tail. Streamers are most characteristic of the genera *Atticora*, *Psalidoprocne*, *Cheramoeca*, *Pseudhirundo*, *Hirundo* and *Cecropis*.

The members of this family have weak legs and feet, adapted more for perching than for walking and running. Not only are the leg muscles smaller than those of other passerines but there are also fewer of them. When on the ground, hirundines are nevertheless mobile; they will adopt a shuffling walk and will occasionally run. Northern House Martins and other mud-nest builders often land on the ground in order to collect mud, and many species also do so to collect grass or other vegetation for the nest, to pick up grit as an aid to digestion or as a calcium supplement, to sun-bathe (see General Habits), to attempt a forced copulation, or occasionally to feed on accumulations of insects or other prey, such as amphipods (see Food and Feeding). In addition, species that excavate burrows or nest on cliffs tend to have strong claws.

The hirundinid bill is typically short and flat, but the gape is wide, the latter an adaptation for plucking insects from the air while in flight. The size of the bill varies with the type of insect taken, Barn Swallows, which feed on large prey, having a stouter bill than that of Northern House Martins, which eat small ones. During the nest-building process, the bill is also used as a means of carrying mud or digging a hole. Sand martins are specialist excavators and have a relatively small, conical bill, which makes the action of slashing at a substrate easier and more effective. Hirundines have strong jaw muscles, designed in part for snapping at insects and in part for manipulating mud or digging into sand. In addition, their loral feathers act as a lens shade, a further adaptation for catching flying insects.

Many hirundines have a contrasting plumage pattern of dark upperparts and lighter underparts. They are often glossy, metallic blue or green above and often white or rufous, and sometimes streaked, below. In at least three species, the Northern House Martin, the Barn Swallow and the Collared Sand Martin, the plumage exhibits strong ultraviolet reflectance. Other common markings include a pale or rufous forehead, throat and/or rump, a partial or full breastband, and white patches in the wings or the tail. The colour patterns probably have a number of functions. The facial pattern of juveniles of the colonial-nesting Cliff Swallow (*Petrochelidon pyrrhonota*) and Cave Swallow is highly variable and may help parents to recognize their offspring in the sometimes large crèches in which fledglings gather (see Breeding). As nest-owners often sit in the dark entrance to their nest, a pale throat or a pale forehead patch, like that of the Cliff Swallow, probably makes a conspicuous signal to intruders that the nest is

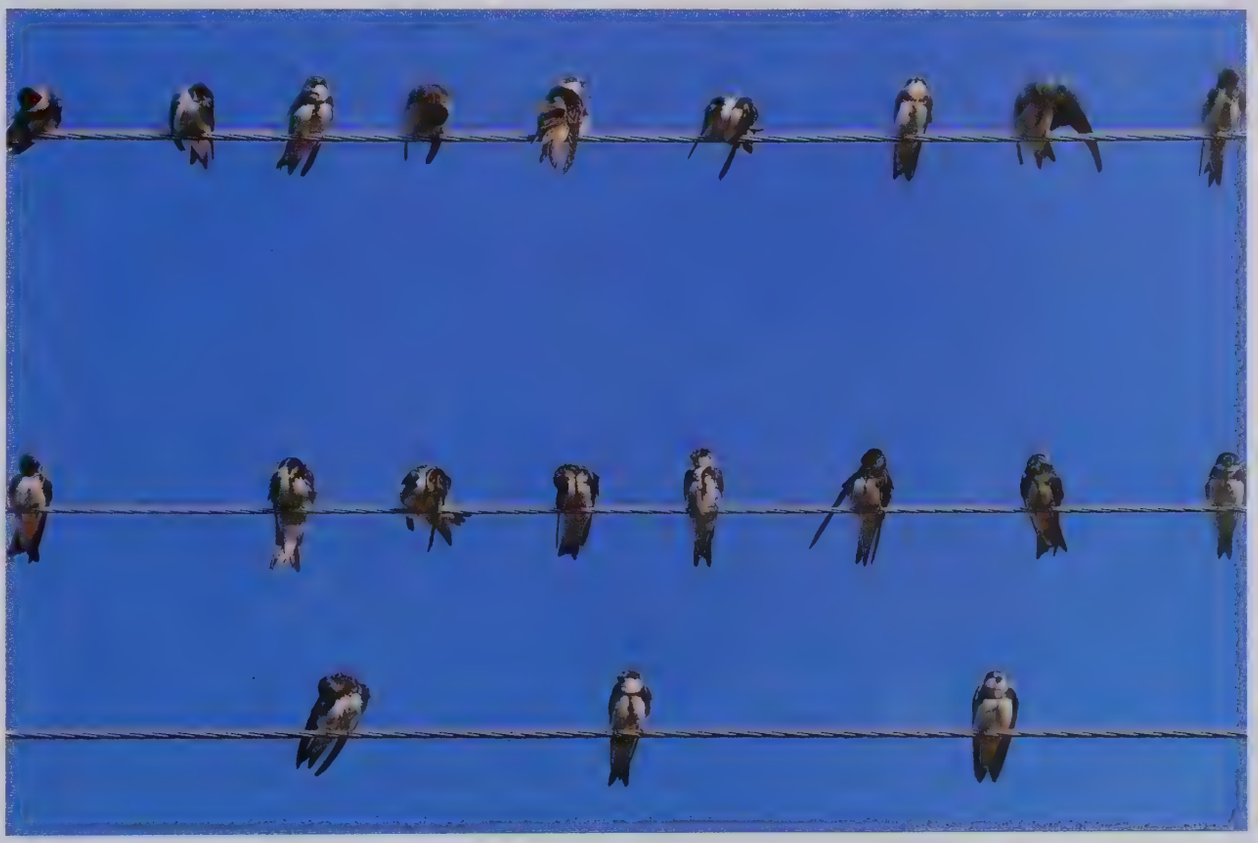


*Many hirundines are gregarious outside the breeding season, but within this context amongst these **Northern Rough-winged Swallows** it can be seen that a regular distance is observed between neighbours. The degree of tolerance hirundines show towards conspecifics varies but, as is to be expected, is greatest amongst the colonial species. During the breeding season most hirundines, including colonial species, fiercely defend their nests and the surrounding area from intruders, and a few even defend larger feeding territories. Despite this, many hirundines frequently come together outside the breeding season to form spectacular, and sometimes enormous, flocks that migrate, feed and roost together.*

[*Stelgidopteryx serripennis*, Belize. Photo: Terry Whittaker/ FLPA]

occupied. During courtship, male Barn Swallows, when they display to females, spread out the tail to show off the white spots in the feathers. Red and white patches may indicate an individual bird's health to potential mates. Carotenoid pigments give the Barn Swallow's throat patch its red coloration, but they are also necessary for the bird's immune system; it is possible, therefore, that only healthy males have enough carotenoid to spare to create a flashy signal that will attract females. Similarly, the white parts of feathers are more susceptible to being damaged by feather lice (Mallophaga), so that only parasite-free males may be able to afford to show off large areas of white in the tail.

Females are usually like males, if a bit duller, and, among species in which the male has an elongated tail, the female's tail is normally shorter. Juveniles are generally duller and browner than adults, often with pale fringes on some of the feathers and a short tail. Wing and tail lengths may increase with age, but in



*At certain times of the year, utility wires festooned with hirundines, such as these **Collared Sand Martins**, are a common feature in many temperate countries. Many species of migratory hirundines start to congregate in the latter part of the breeding season and stay in loose flocks during migration, later to attend large communal roosts at their winter quarters. At the end of the breeding season flocks gather, as roosts of non-breeding birds are joined first by males deposed from nests during the latter stages of brood-rearing and later by females and young. By grouping together, individuals benefit from increased protection from avian predators and the sharing of body heat during cold weather.*

[*Riparia riparia riparia*, Kurgaldzino Nature Reserve, Kazakhstan. Photo: Hanne & Jens Eriksen]





Constant aerial activity is a demanding business but one to which hirundines are well adapted. The energetic pursuit of prey during hot weather can lead to overheating, and one method of losing heat is the wing-raising behaviour illustrated by this ***Brown-chested Martin****. Wing-raising exposes a greater body surface area and greatly accelerates heat loss. Other methods include panting, gaping and dangling the legs in flight. Most hirundines will, however, simply avoid flying in very hot conditions and shun the skies during the middle of the day, preferring to rest up in the shade. It is during these non-feeding periods that birds indulge in comfort behaviour. Preening activity, as illustrated by this* ***Greater Striped Swallow****, is essential for maintaining the body feathers, which help to regulate body temperature, and the flight-feathers, which are so important to such an aerial group of birds. Hirundines also scratch their plumage and indulge in a variety of other feather-care activities common to a great many bird families. One rather less usual method that is commonly observed in the hirundines is the aerial bathing manouevre which involves flying low over stretches of open water and wetting the body by briefly hitting the surface, sending up a small cloud of spray.*

[Above:
Progne tapera fusca,
Pantanal, Mato Grosso,
Brazil.
Photo: Haroldo Palo Jr/
NHPA.

Below:
Cecropis cucullata,
Nieuwoudtville,
Northern Cape Province,
South Africa.
Photo: Peter Steyn/Ardea]

coloration yearling hirundines are mostly the same as older birds. There are, however, a few exceptions to these general principles. The most striking age and sex differences are seen in the *Progne* martins. Adult male Purple Martins are all dark blue, whereas adult females have a greyish collar and underparts, yearling males are like adult females but with some blue feathering below, and yearling females are paler and duller than adult females. In addition, first-year males are shorter-winged and shorter-tailed than adult males, whereas first-year and adult females are equal in size. There are also geographical differences, with western yearling males being even more like females than are those in the east of the range. The function of this variation is still unclear. Yearling male Purple Martins do not seem to gain any benefit from resembling females during the breeding season, such as a reduction in aggression from adult males or easier acquisition of a territory. They may, however, benefit in the non-breeding season, as both yearling males and adult females are dominant over adult males at roosts. First-year female Tree Swallows also differ in colour from older birds, having brownish upperparts with few greenish-blue feathers. Because of the severe competition for nest-sites, they often fail to acquire one of their own, and their brown coloration may, therefore, signal a subordinate status, reducing aggression from territorial pairs while they are searching for a place to breed.

Hirundines moult once annually, after breeding. Since they have to fly efficiently in order to hunt insects, they may take several months to complete the moult, Barn Swallows requiring 4·5-6·5 months. In addition, the duration of the moult depends on the weather; drought, for example, can both reduce insect abundance and increase the distance of roost-sites from feeding sites, concomitantly reducing the rate of moult. Hirundines breeding at high latitudes do not have sufficient time in which to complete the moult after breeding and before bad weather forces them to migrate, so the main part of the moult often occurs in the non-breeding quarters. However, they often start to moult some feathers, particularly those of the body, the inner primaries, the wing-coverts or an inner tail feather, before commencing migration, and Tree Swallows sometimes start even while still engaged in breeding. The extent of the moult before migration is variable, Collared Sand Martins replacing a few body feathers and inner primaries, while Tree Swallows complete half of their moult. The process can continue during migration, as is the case with, for instance, Tree and Northern Rough-winged Swallows. Some species, the Barn Swallow and the Purple Martin being examples, then suspend the moult while crossing areas where feeding is difficult or impossible, such as the Sahara Desert or the Gulf of Mexico. In contrast, eastern populations of Northern Rough-winged Swallows delay their crossing of the Gulf of Mexico, remaining on the northern Gulf coast for about two months, until they have finished moulting their flight-feathers. On the opposite side of the world, the Nepal House Martin (*Delichon nipalense*), resident in southern Asia, has an unusually protracted primary moult throughout the breeding season, and the moult is suspended from mid-November to mid-March, when the weather is very cold. Juvenile hirundines tend to start the moult, particularly that of the flight-feathers, later than do adults.

The body feathers and the wings are typically moulted first, followed by the tail feathers, but the outer primaries and rectrices may still be growing when the bird returns to its breeding area. The body moult is variable, starting with the back, breast and belly and then the crown, chin and rump in the case of Tree Swallows, but these areas of the plumage are replaced concurrently by Northern Rough-winged Swallows. The primaries are shed in sequence from the inner to the outer ones. The secondaries are replaced either from the outer feathers inwards towards the body or in two series; in Northern Rough-winged Swallows, for example, moult of the inner series S8-S9-S7 begins before the outer series S1-S6. The tail feathers are moulted from the centre outwards, but the outermost feathers may be replaced before the penultimate, or even the antepenultimate, ones. The wing and tail feathers are usually moulted symmetrically, so that the bird can still fly efficiently.

Habitat

Swallows and martins are found in a wide variety of mainly open or semi-open habitats, especially near water, ranging from savanna and farmland to coastal mangroves and forested rivers, and from remote mountain crags to bustling towns and cities. They also breed at a wide range of altitudes, from sea-level up to about 4000 m.



*Hirundines tend to be enthusiastic but rather unaccomplished songsters. Typically, **Tree Swallows** are highly vocal: not only do they have a territorial song, but up to fourteen separate calls have been identified. These calls transmit information that is essential for successful mate selection, copulation, nesting and brood-rearing. The two birds here may be indulging in courtship behaviour, when the male gives specific calls which entice the female to view a nest-site or to solicit copulation. Although hirundines are socially monogamous, extra-pair paternity is very common in Tree Swallows and so the exchange seen here might actually be an opportunistic encounter during an absence of both birds' true partners.*

[*Tachycineta bicolor*, Ohio, USA. Photo: Dave Maslowski/ Maslowski Productions]



To a certain extent the diet of many hirundines reflects the spatial and temporal availability of the flying insects that form the bulk of their prey. Although dietary composition is largely unknown for many species, that of the ***Violet-green Swallow*** *is relatively well studied, consisting mainly of leafhoppers, leafbugs, flies, ants, wasps, bees and beetles. This species often feeds much higher above the ground than its congeners, presumably an example of the kind of niche separation that helps to reduce direct competition between sympatric hirundines and other birds with similar feeding methods, such as swifts (Apodidae).*

[*Tachycineta thalassina thalassina*,
Falkland,
British Columbia, Canada.
Photo: S. Roberts/Ardea]

Many species make their nests in a pre-existing cavity, such as an old woodpecker (Picidae) hole in a dead tree, an abandoned burrow in a riverbank, or a rock crevice, and are not "primary excavators". This is the case for the *Tachycineta* swallows and the *Progne* martins, for example. The natural breeding distribution of these species is therefore limited to such habitats as woodland, crags and sea cliffs where sites of this kind are available. They do, however, readily take to using artificial sites, including the roofs of houses, pipes, streetlamps and nestboxes; such sites have increased the type of habitat suitable for breeding in, such as open grassland, tundra, towns and cities lacking natural nest-sites. The eastern population of the Purple Martin, for example, now breeds almost entirely in human settlements, in specially provided "houses". Other species, as typified by the *Riparia* sand martins, excavate their own burrows and are also limited by the availability of suitable substrates such as riverbanks, but they, too, often utilize artificial sites, such as road cuttings, and sandy banks in quarries, thereby extending the range of habitats in which they can thrive. Because of erosion and changes in human usage, which both create and destroy breeding habitat, sites for burrows are often ephemeral, however, sometimes leading to changes in local abundance and distribution of tunnelling species.

Members of the *Hirundo* group (see Systematics) have taken another path. They build their own "cavity" of mud, which they can attach to a variety of natural substrates such as cliffs, trees, cave ledges and riverbanks. It is this group, however, that has exploited humans the most, using bridges, culverts, wells, barns, houses and other buildings as nest-sites. For some mud-nest builders, such as the White-throated Blue Swallow (*Hirundo nigrita*), this is a relatively new habit, but others, such as the widespread Barn Swallow, have been making their nests in our homes for centuries and now rarely use natural sites, breeding mainly in human settlements, including busy cities, or along roads and railways.

Mud-nest builders are most diverse in Africa, where seasonally dry habitats have been available during the course of their evolution. As mud nests can crumble in conditions of high humidity, humid tropical areas are less suitable for these species. In contrast, cavity-nesters are most diverse in the New World, perhaps because of a greater abundance of sites available in the forests and mountain chains of these continents.

Many hirundines are fairly catholic in their choice of breeding habitat. For these, the presence of a nest-site and a good food supply are the important factors, rather than whether the site is a coastal cliff, a barn on farmland, a bridge along a road, or a building in the centre of a city. These species are often widespread and common, the Barn Swallow, for example, breeding throughout most of North America, Europe and Asia. Other species are more likely to be found in particular habitats or at certain altitudes. Thus, in Africa, Lesser Striped Swallows (*Cecropis abyssinica*) generally occur in wooded areas at elevations of up to about 2000 m, whereas Greater Striped Swallows (*Cecropis cucullata*) in the same geographical range are more typical of open grassland at higher altitudes. Members of the tree swallow group are typically associated with waterbodies such as lakes and other wetlands, including mangroves. Many hirundines are, or were, typical of upland areas; while some, such as the White-tailed Swallow, are still found only at high elevations, others, such as the Eurasian Crag Martin (*Ptyonoprogne rupestris*), have extended their altitudinal range by nesting on buildings in lowland areas, as well as on rock faces. A few hirundines are specialists or are restricted in habitat type. One subspecies of the Purple Martin, for example, breeds mainly in holes in saguaro cacti (*Carnegiea gigantea*), and the Bahama Swallow typically uses holes in Caribbean pine trees (*Pinus caribaea*). Some, such as the Square-tailed Saw-wing (*Psalidoprocne nitens*) and the Forest Swallow, are typical of forest clearings, and several species, including the African River Martin, Brazza's Martin, the Congo Sand Martin (*Riparia congica*), and the White-banded (*Atticora fasciata*), Black-collared (*Atticora melanoleuca*) and White-throated Blue Swallows, breed on forested rivers.

Besides sites for breeding, hirundinids also need a good supply of their food, flying insects. Vegetation such as trees or scrub provide a source of insects, as do ponds, lakes and similar waterbodies. Water is important in the life-cycle of many insects and, as a consequence, provides a good source of prey for hirundines, especially in adverse weather when flying insects are

scarce elsewhere. During cold spells in spring, especially, large numbers of swallows of several species can concentrate at a few waterbodies that provide the only good feeding at the time. Hirundines, therefore, often feed around trees and over water. When breeding, they tend to forage close to the nest, often within a few hundred metres of it, so that good foraging habitat is an essential part of the breeding habitat. In addition, the method of foraging, that of catching insects in flight, requires sufficient open space in which the birds can manoeuvre, thus limiting their distribution in forested areas, apart from clearings, forest edge and waterways. As well as providing a good habitat for feeding, water is often a beneficial feature of the breeding site: nests built over water are better protected from predators than are those constructed over land.

For roosting, hirundinids either use nests and burrows (see General Habits) or exploit tall vegetation such as trees, reedbeds, marshes or such crops as maize (*Zea mays*). They also roost in cliffs, under bridges and, in towns, on building ledges, in trees or on wires. Northern House Martins, however, as well as using nests, are thought to sleep on the wing, in particular in their winter quarters in Africa, from where there are few documented records of roosting individuals.

Migration routes and wintering areas need to provide both good feeding and good roosting sites, but a wider variety of habitats, including wetlands, grassland, coasts and others, can be exploited than is possible during the breeding season. In their non-breeding quarters, hirundines are more mobile and are able to feed farther from their night-time base, and over more varied habitats, than they can when tied to a nest. Barn Swallows in southern Africa, for example, forage over grassland, woodland, forest edge and, especially, wetlands and tend to range up to about 100 km from the roost, whereas, when breeding, they favour farmland and usually feed within a few hundred metres of the nest.

General Habits

The majority of hirundines are not very social in the breeding season, when they nest solitarily or in loose groups, and forage alone or in pairs or small flocks. Some, such as the Mangrove Swallow, are highly territorial, feeding mainly in their own large territory, but many species defend only the nest and its immediate vicinity, with several pairs perhaps feeding over the same area. A few species are truly colonial, building nests close to each other and feeding in large flocks. Typical examples of these are Preuss's Swallow (*Petrochelidon preussi*) and the Cliff Swallow.

On the breeding grounds, pair-members generally roost at the nest once they have claimed a site and the nest itself is substantially built. Before that, they roost in sheltered sites, as on rafters in buildings or in trees or burrows. As breeding progresses, it is usually the female that remains on the nest at night, especially when she has eggs to incubate or young nestlings to brood (see Breeding); her mate may join her if there is room, or else perch close by. As the nestlings approach the fledging stage, their parents often perch outside the nest, and males, especially, may roost elsewhere, joining communal late-summer roosts. Non-breeding individuals, too, often roost communally.

Once a brood has fledged, the more solitary species stay in family groups for a few days or weeks. Among the more sociable ones, however, the juveniles form crèches (see Breeding). In the case of non-migratory species such as the Nepal House Martin, the partners, after breeding, may remain at the nest-site, roosting in the nest, but hirundines are generally gregarious at this time, feeding, perching, preening, migrating and roosting in flocks. The act of assembling in a group may provide protection from avian predators such as sparrowhawks (*Accipiter*) and hobbies (*Falco*). In a flock, because there are more individuals that may detect a predator, any one bird can afford to be less vigilant and is, moreover, less likely to be caught, as a predator may find it difficult to single out one individual from a large group. Late-summer daytime flocks may consist of just a few tens of birds but, later, larger groups form, especially at roosts, which can contain thousands or hundreds of thousands of individuals. Hirundines often assemble at the roost-site an hour or two before sunset and perform spectacular aerial manoeuvres, dense flocks flying to and fro over the site before dropping into the roost. Flocks and roosts often consist of more than one species of hirundine and sometimes include other bird species. Purple Martins, for example, often roost with Brown-chested, Grey-breasted and Southern Martins in their winter quarters.

Within a perching or roosting flock, the individual birds are not always very sociable. Barn Swallows maintain an average distance from each other of 12 cm, and more when preening. Those that approach too closely will gape at or peck each other. The more sociable Cliff Swallows will perch 10 cm, and sometimes only 3-4 cm, apart, but they will also try to knock other individuals off their perch or peck at them, forcing them to fly off. Purple Martins are less aggressive towards each other and will perch 5-6 cm apart, and Collared Sand Martins are content with distances of only 3-4 cm. Individuals entering a roost will also try to displace others from favourable central or upper positions.



Whilst diet in hirundines is largely dictated by prey availability, niche separation is achieved by the fact that different species single out prey in favoured size classes. Large Progne *martins, such as the* ***Southern Martin****, have a marked preference for larger prey items, for example dragonflies, whereas other hirundines specialize, for instance, in the capture of large flies or small, but numerous, swarming insects. Southern Martins will feed at different levels above the ground, depending on the circumstances. Birds can often be seen foraging alone, but they will also gather together in small groups.*

[*Progne elegans*, Patagonia, Argentina. Photo: Yves Bilat]



*Coughing up pellets is a daily task for busy insectivorous birds, such as the **White-winged Swallow**. Many insects are characterized by hard exoskeletons composed of chitin, parts of which are simply indigestible. After food items are ground up in the gizzard, any hard fragments are ejected via the mouth, in the form of compact pellets, rather than passing through the remainder of the digestive tract. The diet of this species includes flies, ants, wasps, beetles, butterflies and moths, which are taken during long, fast flights, often over extensive open stretches of water.*

[*Tachycineta albiventer*, near Calabozo, Guárico, Venezuela.
Photo: A. Greensmith/ Ardea]

Hirundines spend much of the day in feeding, especially when they have nestlings. Early in the breeding season, they typically spend many hours away from the nesting site, especially in the afternoon. Nest-building, on the other hand, is more of a morning activity, sometimes extending to the early afternoon, this period perhaps being selected in order to allow enough time for mud, where this is used, to dry before nightfall, and to allow the birds to acquire sufficient food to last the night. Nest-building also tends to be undertaken in bouts between periods of foraging. Once the female starts to lay, the partners stay closer to the nest and return more frequently. This trend continues during incubation until, when they have nestlings to feed, they are visiting the nest every few minutes (see Breeding). After breeding, hirundines spend more time in loafing on wires or in trees and in preening, and again leave the breeding site for long periods in order to forage. As hirundines are visual hunters, they feed during the day in full light. Furthermore, they require temperatures that are high enough for their insect prey to be active. At high latitudes, for example, the light at dawn may be adequate, but it may be too cold for insects to be flying, and the birds therefore pass this time in perching, preening or indulging in mating activities. High temperatures can also affect foraging, by making insects more active and difficult to catch. Foraging usually continues until near sunset, although the birds are able also to catch insects after dusk when artificial light sources are present.

Feeding on insects in flight means that hirundines are exposed to the prevailing weather for long periods. In hot weather, hirundines will gape, pant and raise their wings, and also extend their legs while in flight, in order to lose heat. In the tropics, especially, they often avoid foraging during the hottest part of the day, choosing instead to perch in shade, and feeding more in the cooler hours of the morning and late in the day. Purple Martins have been recorded as soaking their belly feathers before returning to brood nestlings, perhaps as a means of cooling the chicks. Strong wind and rain also affect the ability of hirundines to forage; whereas Purple Martins usually just sit out a spell of rain, Barn Swallows will seek out alternative feeding sites where insects are still active. In very cold weather, both when roosting at night and during the day, hirundines often huddle together, sometimes on top of one another, in a nest, burrow, nestbox, cavity or other sheltered site, which probably helps them to retain body heat. In various instances, more than 100 Collared Sand Martins were found clustered inside a dovecote, eight Barn Swallows inside a single nest and, similarly, 14 Northern House Martins in a single nest. Individuals in such groups are sometimes in an apparently torpid state. White-backed Swallows found in this condition, for example, have been cold to the touch and apparently lifeless, but have revived and flown away when warmed. It seems possible that this behaviour lent credence to the early theory regarding the whereabouts of Barn Swallows in the winter, namely that they hid in rock crevices or under water and remained torpid until the spring. The body temperature can drop in such conditions, which helps individuals to conserve energy, and this, together with clustering, may allow them to survive for a day or so without food in severe weather. In experiments, it was found that Northern House Martins, by clustering, reduced their metabolic rate by a quarter during the day and by a third at night, and in extreme conditions they became torpid, lowering their night-time body temperature from the normal 36-40°C to less than 30°C.

Because they fly for much of the day, hirundines need to keep their feathers in good shape and they regularly preen them. Preening is most frequent early in the morning and late in the evening, before and after the main feeding period. Hirundines also scratch, both while perched and in flight. When bathing, they usually skim over water and hit the surface briefly, sometimes more than once, so as to splash themselves, but they will also wade into shallow water. In addition, they are known to bathe in dew and to dust-bathe. Another regular activity among swallows and martins is that of sun-bathing. This takes place on a cliff face, on bare ground, on a wire or the roof of a building or nestbox, even on hot metallic surfaces, where the bird ruffles its feathers, fans the tail and stretches out the wings, sometimes lying on one side to expose the other to the sun, and also opening the bill and panting. These bouts of sunning can last for several minutes and are thought to help in controlling ectoparasites.

Among group-living species, preening, bathing and sun-bathing can be communal activities. One study demonstrated that Cliff Swallows, by assembling in large groups to preen, were able to spend more time in attending to the plumage and less in watching out for predators.

Voice

Swallows and martins do not have the most mellifluous of voices, the male's song often being no more than a series of twittering or

grating notes. Male Tree Swallows sing apparently as a means of proclaiming ownership of a territory. Male Barn Swallows, on the other hand, sing in order to attract females during courtship, and they may be showing off their good qualities: they give a twittering song more when they have few parasites and a healthy immune system, and females prefer males with complex songs. Barn Swallow songs also vary with the size of the breeding group and the individual male's testosterone level. Purple Martins and Tree Swallows have a distinctive dawn song, delivered before daylight while the bird flies high up over the nest-site, perhaps to attract conspecifics to the group.

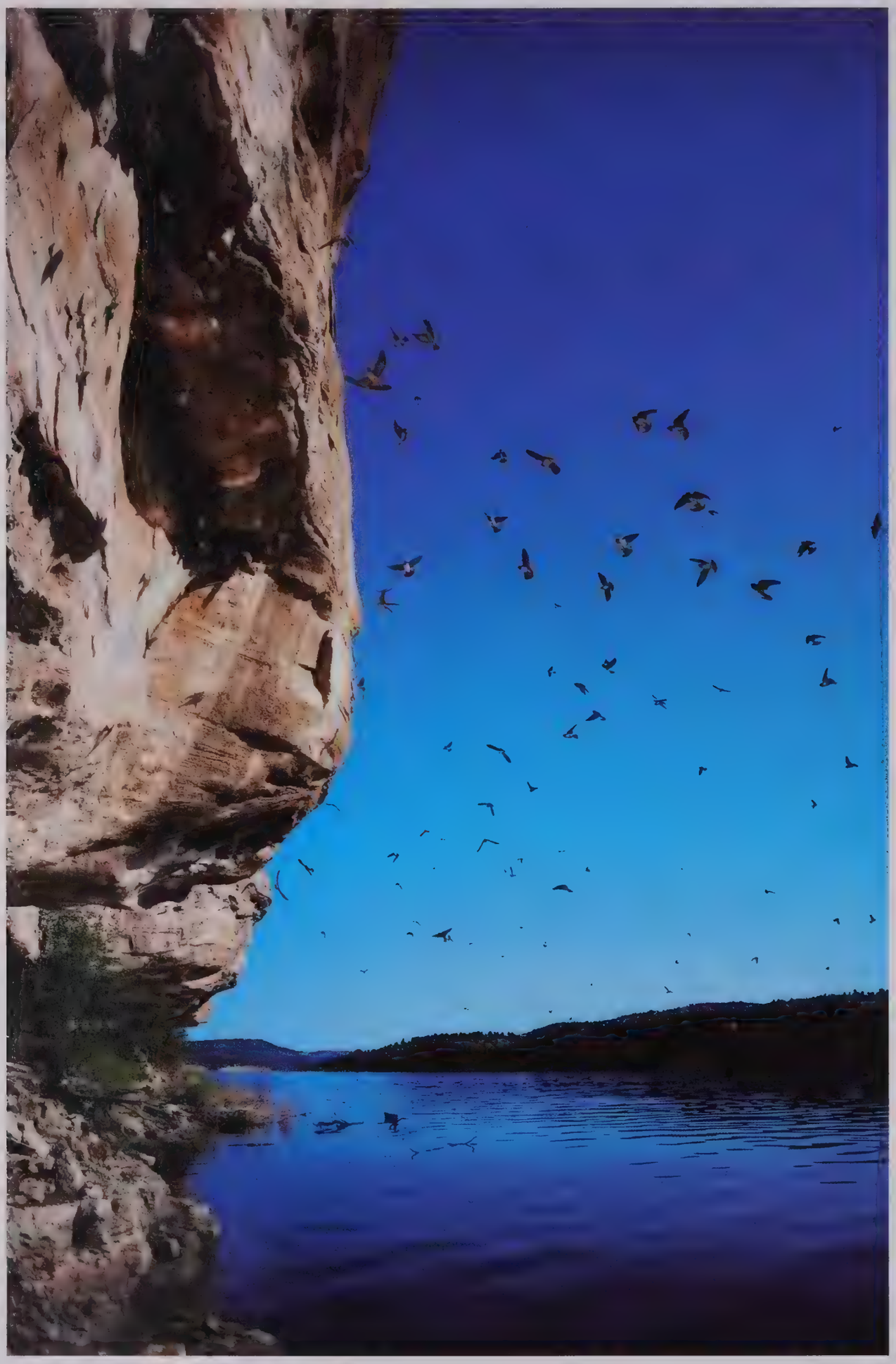
While both male and female Collared Sand Martins sing, female hirundines often either do not sing or have their own song. Barn Swallow females, for example, twitter, and Purple Martin females have a "chortle" song which they utter during courtship. Juveniles emit a subsong, as also do males sometimes after breeding.

Apart from the song, the main vocalizations are the juvenile's begging call, an alarm call used when predators are seen, and a contact call used on many occasions between members of a pair or a family. The number of calls varies considerably among species, however, with colonial species tending to have fewer: Tree Swallows have 14, Purple Martins eleven, Barn Swallows ten, and Cliff Swallows only five. In the more vocal species, the vocalizations can include a contact call, used by parents when feeding or leading fledglings; a low-level alarm call and a high-level alarm call, the latter used when a predator is close to the



***Barn Swallows** and other hirundines frequently drink, and do so with typical panache by skimming low over the water and trawling the lower mandible through the water. Such low-level flight is typical of the Barn Swallow when foraging too, as it is at this height that its preferred prey of large flies are to be found. Favoured prey items during the breeding season include hoverflies, horseflies and blowflies, all of which demand the utmost speed and agility for their capture. The high energy output expended in capturing such mobile prey items is compensated for by the large size and calorific value of each insect. Other sympatric hirundines feed in higher strata and tend to pursue smaller, more numerous flying insects in a rather more relaxed and languorous fashion, thereby avoiding competition with the Barn Swallow. During periods of inclement weather, when flying insects are scarce, other hirundine species will also feed very close to the ground, but even then there is an element of separation, as Barn Swallows tend to feed over water more often than sympatric hirundines.*

[*Hirundo rustica rustica*, Sussex, England. Photo: Stephen Dalton/ NHPA]



*The breeding strategy of the **Cliff Swallow** relies heavily on the maxim that there is safety in numbers. Breeding colonies typically contain 200-400 nests, but one enormous colony contained a staggering 3700 nests. Nesting in this way, coupled with synchronous egg-laying, tends to swamp potential predators and avoids the high ectoparasite burdens, prevalent later in the season, that would certainly cause high mortality amongst very young nestlings. Hatching rates in this species have been shown to increase with colony size, which clearly demonstrates one of the benefits of colonial life. A range of other activities are also made safer or more efficient by group-living. Preening, for example, is a potentially hazardous occupation demanding a lot of attention and exposing birds to the risk of predation; it is accomplished more safely in groups. However, the biggest benefit of colonial living for this species comes in the level of co-operation demonstrated in locating and tracking food resources. Cliff Swallows feed on small, swarming insects that are mobile, local and ephemeral in occurrence, as well as often occurring significant distances from the colony. Individual colony members co-operate by giving a specific call to summon others when they locate a swarm. This behaviour allows individuals to return to feed young in the colony and then relocate the swarm again. In addition, birds that have been foraging with limited results can observe successful neighbours in the colony and simply follow them out to better feeding areas.*

[*Petrochelidon pyrrhonota*, McPhee Reservoir, Dolores, Colorado, USA. Photo: Claude Steelman/ Survival/Oxford Scientific Films]



Like other hirundines that build mud-nests and were formerly restricted to breeding on cliffs and rock outcrops, the ***Northern House Martin*** *has taken full advantage of the relatively recent arrival of a variety of man-made structures. Using sites such as this bridge for nesting on must have allowed this species to expand its range dramatically during historical time. This bridge arch admirably meets the requirements of a good nesting site. The nests are placed high up over water on an overhanging surface, features that are likely to restrict access by predators. In addition, approaching adults have a clear flightpath directly to the nest. It is also important, for species that build mud-nests, that the nests are well protected from the elements, because they are easily damaged by water or excessive heat.*

[*Delichon urbicum*, Spain. Photo: Bengt Lundberg/ Nature Picture Library]

nest; aggression and submission calls, uttered when individuals chase and fight each other near the nest and near their mates; enticement calls, used by males to attract a female to a nest-site and by both sexes to lead fledglings to a roost-site; and copulation calls, given prior to copulation. Some swallows apparently use alarm calls deceptively, when no predator is nearby, Barn Swallows in order to stop their mate from copulating with another male and Cliff Swallows to gain entry into evacuated nests. In addition, foraging Cliff Swallows have a specific call, the "Squeak" call, that signals the presence of a supply of insects and attracts other Cliff Swallows.

Soon after hatching, nestlings can be heard to make a faint, squeaky call, which develops into the juvenile call. This is used for soliciting food while the youngsters are still dependent on their parents; it then develops into an adult contact call. Adult Cliff Swallows can recognize their own offspring from these juvenile vocalizations, a necessity for this colonial species as fledglings from different nests mingle in large crèches (see Breeding). The Cliff Swallow nestling's call is individually distinctive by the time it is 15 days of age, several days before fledging, and the calls of nestmates are more similar to each other than are the calls of unrelated nestlings. Likewise, nestlings of the colonial Collared Sand Martin develop distinctive calls a few days before they fledge. In contrast, Barn Swallows appear not to recognize the calls of their offspring, which are much simpler than those of young Cliff Swallows; as Barn Swallows are more solitary, the parents can keep their brood separate from other families and therefore have less need to distinguish between fledglings. In the same way, parent Tree Swallows, another solitary species, also fail to recognize their offspring. Juveniles of both Barn Swallows and Tree Swallows, however, seem to recognize their parents' calls.

Other sounds made by hirundines include bill-snapping, especially during courtship. Cave Swallows have been recorded as making fluttering sounds with the wings, and a swishing sound as the wingtips brush against the wall of a cave. In addition, W. Lunk noted that Northern Rough-winged Swallows produce a shrill whirring sound; it is not known if this derives from the serrations on the primary feathers (see Morphological Aspects) and is part of a display.

Food and Feeding

Hirundines feed almost entirely on flying insects throughout the year. Unfortunately, the composition of the diet of many species is poorly known, and in some cases the only information is derived from the stomach contents of a small number of museum specimens. A few species, however, have been studied in some detail.

The insects taken by any one species generally come from a wide variety of taxonomic groups, and probably reflect the availability of the prey on the local level. In studies of Purple Martins and Cliff Swallows, for example, it was found that these species caught insects from 57 and 84 families, respectively. The types of insect taken include plant-bugs and true bugs (Hemiptera), such as cicadas (Cicadidae), along with beetles (Coleoptera), dipteran flies ranging in size from tiny midges such as chironomids to large hoverflies (Syrphidae) and horseflies (Tabanidae), dragonflies (Anisoptera) and damselflies (Zygoptera), caddis flies (Trichoptera), mayflies (Ephemeroptera), lacewings (Neuroptera), grasshoppers and crickets (Orthoptera), butterflies and moths (Lepidoptera), various hymenopterans, including parasitic wasps, bees, and ants, and termites (Isoptera). Different swallows and martins do, however, seem to prefer prey of certain sizes. Large martins of the genus *Progne* often take dragonflies and damselflies, Barn Swallows specialize on large flies, and Northern House Martins and Cliff Swallows concentrate on small, swarming insects.

Hirundines are very selective. They do not simply vacuum insects out of the air, but they choose which prey to pursue. Studies





*The **Collared Sand Martin** breeds in densely packed colonies, largely in response to the spatial distribution of suitable breeding sites, which tend to be scarce and often ephemeral. Suitable breeding sites consist of exposed, unvegetated earth and sandbanks into which the birds dig a tunnel terminating in the egg-chamber. Males start digging burrows on arrival at the colony, and when the work is half completed they start to sing and display to attract females. Courtship and copulation follow and burrow construction is completed by the pair. Although colonial, pairs are territorial and vigorously defend their burrows from intruders. Advantages of colonial life include enhanced detection of predators and, for older males, the chance of more frequent extra-pair copulation. Predators are undoubtedly attracted to the food resources represented by large colonies but few are capable of making significant impact on the glut of eggs and young present during the breeding season. In some species, hatching success is highest in the largest colonies, but high rates of fledging success appear to demonstrate a compromise, as it is usually higher in medium-sized colonies, perhaps reflecting the higher levels of competition for food and the higher ectoparasite burden that limit production in the largest colonies. Although in some parts of its range the Collared Sand Martin has undoubtedly been affected by excessive river engineering, which prevents the episodic natural creation of fresh breeding sites, it has not been slow to use the many new artificial sites brought about by human activities, such as sand and gravel extraction.*

[*Riparia riparia riparia*, Lake Kerkini, Greece. Photos: Manfred Pfefferle]

have shown that, in relation to the sizes of prey available in the environment, they take a greater proportion of larger insects on average. Nevertheless, even the bigger hirundines catch some small prey, especially when these form large swarms, such as those of flying termites or ants. Stinging insects are generally avoided, but some wasps and bees, especially stingless drones, are taken; further, hoverflies, which mimic wasps, are caught in large numbers. Hirundines eat a few non-insect prey, such as spiders drifting on threads in the air, or tiny amphipod crustaceans swarming on a beach.

A few hirundines also consume some plant food. Greater and Lesser Striped Swallows have been recorded as eating fruit, and Barn Swallows in their winter quarters feed on the seeds of acacia trees (*Acacia*), as well as on insects. Similarly, Tree Swallows include some seeds and berries, mainly of *Myrica* species, in their diet, particularly in the autumn, winter and early spring and in adverse weather, when insects are scarce. The last species is unusual in being able to digest the waxy coating of *Myrica* berries, and it is capable of surviving for long periods on a diet of berries alone; as a consequence, it can spend the winter months along the east coast of North America, occasionally as far north as Massachusetts, where flying insects are scarce, and it also returns to the breeding grounds earlier in spring than do other migratory hirundines.

The type of insect taken varies locally with the time of year and also with the weather conditions, both between years and over the course of a season, and even within the course of a day. In the cool early hours of the morning at high latitudes, for example, large flies may not be active but bees may be found at that time. Barn Swallows catch large flies mainly in the late morning and early afternoon, whereas plant-bugs are taken both earlier and later in the day. Dietary differences from one year to another can be substantial, as was demonstrated at a site in Scotland, where hoverflies formed 23% of that species' diet in a hot, dry summer, but only 9% in a cool, wet one. In addition, there are variations in diet between the non-breeding and breeding ranges if the bird migrates. Barn Swallows concentrate on flying ants more in the winter than they do in the summer, as these are abundant in their African winter quarters; termites, which are not available at the breeding sites, are also taken in the southerly, non-breeding areas, and these can be a particularly important source of food.

Nestlings, too, experience seasonal changes in the diet. In a study of Purple Martins, flies and aphids were fed to the nestlings mainly early in the season, and butterflies, true bugs and hymenopterans later on. Adult and nestling diets also usually differ somewhat, the parents eating smaller insects than those which they take back to the nest for the brood.

When feeding nestlings (see Breeding), hirundines usually catch several insects on a foraging trip and compress them into a food ball, or bolus, although large insects, such as some moths and butterflies, dragonflies and grasshoppers, are brought separately to the nest. A bolus can contain dozens of large insects or hundreds of small ones, varying considerably even within a species. In various studies of Barn Swallows, the average number of prey items per bolus ranged from 3·5 to 19, with total numbers of insects ranging from one to over 175. Species feeding on smaller insects collect more of them per foraging trip. In Scotland, for instance, food boluses of Barn Swallows contained 18 insects, on average, and those of Collared Sand Martins 60, and in the USA, at a site where Barn Swallows collected an average of only 3·5 insects per trip, Cliff Swallows were catching 18·7.

Otherwise, an intriguing report from southern South Africa was of a pair of Greater Striped Swallows that fed its nestlings not only with insects, but also at times with the seeds of *Acacia cyclops*. The parents, it seems, delivered these seeds, with the nutritious funicles still attached, more frequently in cloudy or adverse weather than they did on sunny days.

Different species of hirundine feeding in the same area avoid competing with each other, and with other aerial insectivores, by foraging at different heights or in different places, as well as on different sizes of insects. In Europe and Asia, Barn Swallows typically feed low over the ground, whereas Collared Sand Martins



Violet-green Swallows *have broken away from the ancestral burrow-digging habits of the early hirundines and nest inside pre-existing cavities. Nests are often situated in natural tree cavities and abandoned woodpecker holes. Because of these nesting requirements the Violet-green Swallow tends to occur mainly in wooded habitats, but it is also occasionally found in deserts and other open areas where suitable natural or artificial nest-sites occur allowing it to breed. Although this species readily uses nestboxes, interspecific competition for nest-sites can be intense, and elsewhere unsympathetic forestry management practices may be detrimental, for instance the removal of dead and diseased trees that are likely to contain suitable cavities.*

[*Tachycineta thalassina thalassina*, Colorado, USA. Photo: Dave Maslowski/ Maslowski Productions]



Bank-nesting species are not always colonial. The ***Northern Rough-winged Swallow*** *breeds in solitary pairs or small groups at sites including sand or gravel banks, quarries and road cuttings. Although this species will dig its own burrow if necessary, it prefers to adapt a pre-existing one. The bill is used to hack earth away and the resultant debris is cleared from the tunnel using the wings and feet. This species and other burrow-nesting hirundines share a common feature in possessing much stronger claws, an adaptation to facilitate digging. Burrows tend to be dug 30-100 cm into the bank, at the end of which an enlarged nest-chamber is constructed.*

[*Stelgidopteryx serripennis*, USA.
Photo: Ron Austing/FLPA]

feed at mid-levels and Northern House Martins at middle to high levels, but in all cases lower than Common Swifts (*Apus apus*), which are potential feeding competitors. In bad weather, however, flying insects, especially those normally found at high altitudes, are scarce, and any that are available are present mainly at low levels, particularly over water. In these conditions, all the species feed low down but they still segregate to some extent, with Barn Swallows foraging over water more than do the other species. The differences in foraging height and habitat are related to the type and size of prey taken; Barn Swallows hunt the largest prey, found near the ground, and Northern House Martins take much smaller swarming prey, found higher up. Thus, in one study, aphids formed only 0·3% of the diet of Barn Swallows, but 12·4% of the Collared Sand Martin's diet, 17·8% of the Northern House Martin's and 27% of the Common Swift's; nematoceran flies such as midges were also a small part of the diet of Barn Swallows and Common Swifts, constituting 12·6% and 9·8% respectively, compared with 22·2% for the Collared Sand Martin and 25·4% for the Northern House Martin. The Barn Swallow preferred brachyceran and cyclorraphan flies, such as horseflies and hoverflies, more than did the other three species; these two dipteran suborders accounted for 69·9% of its food intake, whereas the figure for the Collared Sand Martin was 47·1%, for the Northern House Martin 39·5% and for the Common Swift 37·1%.

Different species also have different styles of flight, depending on what they are hunting, and where. When chasing fast-flying, manoeuvrable insects close to the ground, hirundines fly swiftly, with frequent banking and turning, whereas gliding and fluttering flight are used at higher levels when hunting less agile, often aggregated prey. Barn Swallows typically fly actively, whereas Purple Martins are usually observed as they sail in circles, alternately flapping and gliding. Eurasian Crag Martins often fly back and forth along a cliff face, taking advantage of thermals.

Although the primary foraging method is that of hunting insects on the wing, hirundines sometimes perch to pick prey from the ground or other surfaces. This behaviour is most frequent either in adverse weather, when few insects are flying, or at times when crawling prey are particularly abundant, as during a termite emergence. South African Swallows (*Petrochelidon spilodera*) are particularly prone to feeding from the ground. Hovering and fluttering against vegetation to flush out insects, including caterpillars, is another technique sometimes recorded. Hirundines also take insects from water surfaces while in flight or pick up prey while hovering, and in the Neotropics the little White-thighed Swallow will glean prey items from leaves during rain. Swallows and martins are opportunistic and are quick to take advantage of good sources of prey, such as those presented by grass fires, by the actions of other animals, including people, in flushing insects from vegetation, by tractors ploughing fields, and by lamps that attract moths and other insects in the evening. In Western Australia, a Welcome Swallow has even been seen to feed inside a building, where it consumed flies gathered at a window.

During the breeding season, many hirundine species feed solitarily or in pairs. The male may accompany his mate during the egg-laying period, in order to keep other males away (see Breeding), but later in the season the pair-members tend to feed independently, taking turns to bring food to the nestlings or fledglings. In some species and subspecies, the partners also incubate in alternate bouts, and thus have to forage alternately during this stage of the breeding cycle. Feeding areas are not usually defended, however, and birds from several nests may feed over the same site at the same time. When insects are abundant or localized at a particular site, as with a swarm of ants, a mass emergence of mayflies or a mating swarm of flies, or in the lee of a hedge in strong winds, or when borne aloft in a thermal, large numbers of hirundines often converge and feed together, but the individual birds do not always benefit from being together with so many others.

Cliff Swallows, however, do gain an advantage from feeding in flocks, and those breeding in large colonies thereby increase their foraging efficiency and the amount of food that they bring back for their brood. Not only are they attracted to sites where they see that other birds are feeding but, in addition, in poor foraging conditions, they also utter special calls that draw in more birds to the source of insects. By attracting more foragers, they make it easier for themselves to keep track of the insects' location, even if the swarm moves; an individual can return to the colony and still find the swarm again, because it can see the birds still feeding there. Furthermore, a Cliff Swallow colony acts as an information centre: birds that have been unsuccessful in foraging watch out for any of their neighbours that have found food, and then follow them when they next leave to feed. At very large colonies, however, with thousands of nests, individuals can simply join the stream of foragers departing for the feeding site and



*The **Grey-rumped Swallow** breeds in burrows dug directly into the ground. Single pairs or small groups nest in this way in open habitats throughout a large part of sub-Saharan Africa. Open areas with short vegetation are favoured, such as riverine sandbars, grassy riverbanks and sand dunes, but the birds are also quick to use a range of suitable, appropriately managed artificial habitats, including airfields, cultivated areas and sports and recreation fields. In an absence of ground predators, other burrow-nesting hirundines may also nest in this way but how the Grey-rumped Swallow manages to breed successfully in burrows that are so accessible, and also prone to flooding, is a mystery.*

[*Pseudhirundo griseopyga griseopyga*, Marondera, Zimbabwe. Photo: Peter J. Ginn]

do not need to keep an eye on the neighbours. Group-foraging is important for Cliff Swallows because of the ephemeral nature of the prey on which they feed; the insects may be abundant, but the birds cannot predict where they will be. Barn Swallows, in contrast, have a more predictable food supply; scientists have looked for evidence that their breeding groups act as information centres, but have failed to find any, and it seems that, at most, the birds may simply be attracted to areas where other individuals are feeding. Whether the transmission of foraging information plays an important role in colonies of other hirundines is not clear. A study of a large colony of Collared Sand Martins, which feed on prey intermediate in size between those taken by Barn and Cliff Swallows, found some evidence of synchronous foraging, but other studies, of small colonies, did not.

When breeding, hirundines typically feed close to the nest, but some go farther than others, the species preying on small, clumped and ephemeral insects travelling the greatest distances. Thus, Barn Swallows feed within a few hundred metres of the nest and Collared Sand Martins up to 800 m from it, whereas Cliff Swallows fly up to 1·5 km and, occasionally, 6 km from the colony and Northern House Martins also travel several kilometres.

Foraging is greatly affected by the weather, which determines where insects will be available and of which sort they will be. In adverse weather, insects may be found at only a few sites, usually waterbodies. When it is cold, Purple Martins, which normally forage in open areas, will also seek food in towns, by hawking insects around cars. In particularly cold and/or wet conditions, especially in heavy rain, hirundines may be unable to feed at all. There is, however, a striking exception to this general rule. The Montane Blue Swallow, which lives at high altitudes in southern Africa, is well adapted for feeding in poor conditions, even in thick mist, as its body feathers are more effective in repelling water droplets than are those of most other birds.

In addition to food, hirundines ingest small bits of gravel and other items, such as mollusc shells, pieces of fish bone and eggshell. These "non-food materials" perhaps help the birds to digest hard-coated insects and also provide a calcium supplement, especially for females during egg-laying. Interestingly, the adults also feed their nestlings with such items.

Hirundines drink regularly. They do this by flying low over the surface of a waterbody, such as a lake, a small pond or a river, and dipping in the lower mandible to take up the water.

Breeding

As with feeding habits, knowledge of the breeding biology of many species of hirundine is scanty. On the other hand, a few members of the family, especially the Barn and Cliff Swallows, the Tree Swallow and the Purple Martin, have become model species for scientific study over the last few decades and are among the world's best-known birds. A great deal of research into sexual selection and coloniality, in particular, has involved these species. Extensive research has been carried out by A. P. Møller, on the Barn Swallow in Europe, and by C. R. and M. B. Brown and colleagues, on the Cliff Swallow in North America, and the findings are summarized in these authors' recent books, published in 1994 and 1996, respectively.

Wherever they breed, hirundines are dependent on a good supply of insect prey and, hence, on the duration of suitable weather conditions. In temperate regions, they breed in the late spring and summer, taking advantage of the burgeoning insect population at that time. The breeding season is, however, shorter at high latitudes. Barn Swallows, for example, start laying in March in Spain, but not until June in Finland. In subtropical and tropical regions, nesting can be limited to the wet season, when insects are most abundant, or can occur almost throughout the year, sometimes with peaks during the rains. The Wire-tailed Swallow, for instance, breeds mainly in the rains, but in some parts of its range, such as East Africa, it breeds in all months, with peaks of activity in some. In contrast, the White-throated Blue Swallow breeds during the dry season, so as to avoid the problem of its riverside nest-sites being flooded when the rivers swell during the rains. The need to collect mud with which to build a nest may also limit the breeding of some species during long dry periods.

Migratory hirundines generally return to their breeding grounds when temperatures there are rising and insects are becoming more plentiful. For species that migrate or disperse after breeding, an early return to the breeding grounds is advantageous. In some cases, as with Barn Swallows at high latitudes, pairs start to nest soon after arrival; the earlier they arrive, the more likely they are to have time for rearing two or more broods, whereas late-arriving birds may rear only one. In contrast, the single-brooded Tree Swallow arrives early in northern North America to claim a territory, but the arrival and breeding dates





Mud-nest building is a recent evolutionary trait in the hirundine family. This is reflected in the similarity in construction techniques and the narrow genetic distances between mud-nest building species. Indeed, the members of this group are so closely related that some species frequently hybridize. Mud-nest structures do, however, differ in their complexity and fall into three main categories, the more elaborate nests tending to be built by the truly colonial species. The most basic nest type is the simple, open mud cup, built for example by the Hirundo *swallows. Next comes the intermediate nest type built by the* Delichon *martins, consisting of an enclosed cup with a small horizontal entrance slit. The final nest type, built by species such as the* ***Streak-throated Swallow*** *and the* ***Cliff Swallow****, is the most sophisticated and aesthetically pleasing, and consists of an enclosed nest with an entrance tunnel. This last design presumably provides security in densely packed colonies because it is easily defended against intruding conspecifics. In both the illustrated species, pairs share the task of nest-building, and construction in Cliff Swallows takes up to 27 days, the job being quickest where party walls are shared with neighbouring nests. Both these species evolved to breed on cliffs and rock outcrops but have taken full advantage of artificial structures especially barrages, bridges and culverts, which allow them to build nests hanging over water.*

[Above:
Petrochelidon fluvicola,
Ranganathitoo Bird
Sanctuary, India.
Photo: A & S Chandola/
Nature Picture Library.

Below:
Petrochelidon pyrrhonota pyrrhonota,
Peace River,
Wood Buffalo National
Park, Alberta, Canada.
Photo: Mark Bradley/
Boreal Nature Photos]



During the early part of the breeding season it is commonplace to come across hirundines, like this ***Mosque Swallow****, collecting mud at puddles and along the margins of waterbodies. When collecting mud, the bill is used to dig and transport it back to the nest-site. The mud-nest of this species is typical of the genus* Cecropis*, being fully enclosed and having a long entrance tunnel; the nest-chamber is lined with soft material, such as grass and feathers. Hirundines that build mud-nests require reliable sources of building material during the construction phase, and dry periods or droughts can delay or prevent breeding if the nests cannot be built.*

[*Cecropis senegalensis monteiri*, Zimbabwe. Photo: Mike Lane/NHPA]

are not linked. Early Purple Martins gain the advantage of being able to acquire the highest nest-sites, which suffer less predation from climbing predators than do low ones. In the case of Cliff Swallows, which also have only one brood in a season, the earliest birds may do little but forage for several weeks, whereas later arrivals begin nest-building within a few days. Hirundines are, however, vulnerable to bad weather, especially early in the breeding season, as this reduces their food supply. There have been many instances of large numbers dying during a prolonged spell of cold and/or wet weather, and local populations can be reduced or wiped out. In the Great Plains, USA, for example, thousands of Cliff Swallows died after six days of cold weather in 1996 and hundreds perished in a four-day period in 1992. Less severe spells of adverse weather early in spring, however, may occur every few years and limit the start of the breeding season. Brown and Brown found that such weather may select for birds that arrive later on the breeding grounds.

The number of pairs nesting together varies greatly, from one in the case of solitary species, such as the Mangrove Swallow, to hundreds or thousands in the most colonial species, such as the Cliff Swallow. Other hirundines will nest in groups if potential nest-sites are clumped, as happens particularly with artificial sites. Several pairs of Purple Martins, for example, will occupy a single multi-room "martin house". With these and other hole-users, natural groups may develop in certain sites, typified by large, dead trees where woodpeckers have excavated a number of holes, or cliffs with an abundance of natural crevices. Such birds do not necessarily benefit from living together, but, rather, they may breed in groups only because of a lack of alternative good-quality sites; the more sites there are available in an area, the more pairs can settle in it. Some individuals, however, may benefit from living in a group: older males, for example, may have more opportunities to copulate with females other than their mate. Younger males, on the other hand, may lose out by being cuckolded.

In general, there are few advantages to group-living. Indeed, there are disadvantages, one example being the fact that large groups of breeding birds can attract predators. Predators are detected more quickly in large Collared Sand Martin colonies than in small ones, but they also concentrate their attacks on the former. Large groups also result in more competition for resources and harbour more parasites. The most colonial hirundine species suffer the most from parasites, in terms of a reduction in fledging success. Although nestlings of these species, in order to counter the parasites, have a stronger immune response than do those of more solitary species, this is at the expense of a longer nestling period. Cliff Swallows, however, do benefit from being colonial, improving their foraging efficiency as a result (see Food and Feeding); they also detect predators more quickly in large colonies and, in big flocks with many birds watching for predators, each individual can afford to be less vigilant (see General Habits). Nevertheless, some individuals do best in small colonies, and others in larger ones. With Cliff Swallows, the preference for a particular colony size is inherited, individuals choosing to nest in colonies of a similar size to that of their parents. Some birds may be better suited to small colonies and others to large ones, depending, for example, on how well they can cope with the large numbers of ectoparasites in the bigger groups. Breeding success, too, can vary with colony size. In the case of Cliff Swallows, hatching success increases with increasing colony size, while fledging success and the survival rate of fledglings to their first year are highest in colonies of intermediate size.

Male hirundines generally return to the breeding grounds before the females, and older birds also tend to arrive before first-years. In north Texas, for example, adult male Purple Martins arrive some two months before yearling males and females. The males generally claim a nest-site, and start to advertise it or themselves to potential mates. Purple Martins do this by a conspicuous "Claiming-Reclaiming" display, in which the male flies up, circles over the nest-site and dives back down, and then enters the nest-hole and sings from the entrance. Male Collared Sand Martins similarly sing and fly in small circles around the entrance of the burrow, which they start to dig by themselves. Tree Swallows have a "vertical posture" display, in which the male points the bill upwards, droops the wings, sometimes also flicking them, and spreads and raises the tail. If a female shows interest, males may display conspicuous features of their plumage, such as the white throat on Collared Sand Martins and the long white-spotted tail on Barn Swallows, and draw the female's attention to the nest-site by flying to and hovering in front of it, giving a particular nest-advertising call, and entering the hole or perching and pecking towards it. The female is then likely to enter it herself and investigate the suitability of the site. Among



*Colonially breeding **Cliff Swallows** gather in noisy flocks to collect mud at suitable locations. Extra-pair copulation is common in hirundines and, when exposed during the act of mud-collecting, female Cliff Swallows often flutter their wings to deter opportunistic males from attempting copulation. Males of some species jealously guard their mates during the period when they are fertile to thwart other males, but others such as the Cliff Swallow have a more relaxed attitude, so extra-pair paternity is probably common.*

[*Petrochelidon pyrrhonota pyrrhonota*, Denali National Park, Alaska, USA. Photo: Rob Curtis/ The Early Birder]

other species, such as the Cliff Swallow, courtship is almost lacking, apart from some singing, and the male and female do little more than come to tolerate each other at a nest-site.

Pairs generally form on the breeding grounds. Individuals that have bred together in the previous year may come back to the same nest and breed together again. Females are choosy, however, sometimes sampling several males and nest-sites before staying with one male. In the case of Barn Swallows, they base their choice mainly on the length and symmetry of the male's tail, which may indicate his health and vigour. Studies in Europe have shown that males possessing a long, symmetrical tail have a good immune system, are resistant to parasites, and have good prospects of survival; they also pass on their good health and viability to their offspring. Females selecting these males are likely, therefore, to have healthy, long-lived offspring. Males with the most "attractive" tail acquire a mate soon after arrival on the breeding grounds and, further, the mate that they acquire is a good-quality one; moreover, they are also successful in obtaining extra-pair copulations and in avoiding being cuckolded themselves. These males, however, provide less help with nest-building and brood-feeding than do short-tailed males. Females mated to attractive males invest relatively more in reproduction, by laying more eggs, having more broods, and providing more food for the nestlings.

Cliff Swallows and Northern House Martins copulate inside the nest-cavity, while Barn Swallows often copulate on a perch close by the nest. Copulation is sometimes preceded by a short invitation display. The male Barn Swallow hovers above the female with his tail spread wide, whereas the male Cliff Swallow merely moves to the back of the nest and calls softly. Females are active in accepting or rejecting copulation advances. If they accept the advance, they often adopt a crouched posture, spreading the wings, raising the tail and keeping the body horizontal. The male may peck at and hold the female's head feathers in his bill while he mounts. Preening often follows copulation.

Pairs are typically aggressive in defending the nest-site. Owners often sit at the entrance to a nest, advertising their presence. They sometimes engage in threat displays, which can involve ruffling of the head feathers and vibrating of the wings, and also calling, as well as lunging at intruders or even chasing and fighting them. Fights, especially those between rival males, can be violent, with the combatants beating each other with their wings, pecking and holding each other with the bill, pulling out feathers, and grappling with the feet, even falling to the ground. Such fights sometimes result in injury or death. Individuals that fall into water during the course of conflicts can also drown.

The size of the area around the nest that is defended varies from one species to another and also among populations of the same species. Purple Martins in the eastern part of the range, where they nest in bird houses, usually have a territory based on several compartments within a single house, whereas those in natural nesting sites in Arizona have larger territories, with an average radius of 20-30 m, and occupied nest-sites are at least 100 m apart. Mangrove Swallows defend even larger territories, with inter-nest distances of 300 m. Species that nest in holes, or in nestboxes and bird houses, sometimes claim ownership of more than one potential nest-site. Purple Martins utilizing bird houses in Texas hold territories that encompass, on average, three nesting compartments. The spare sites may be used for roosting, or serve as an insurance against the first site being destroyed or taken over by other birds. Males and females can, however, have different reasons for defending more than one nest-site: male Tree Swallows are sometimes polygynous and may try to attract more than one female, whereas females may try to prevent other females from settling near their nest-site. For the colonial Collared Sand Martin, in contrast, the defended area is just the 8-12 cm around the burrow entrance, and for the Cliff Swallow it is no more than the interior of the nest once this has been built.

Hirundines are nearly always socially monogamous, one male nesting with one female. Rarely, a male will acquire two mates, but he will then generally give help almost exclusively to one of them; such polygyny seems to be most frequent among Tree Swallows. On the other hand, matings outside the pair-bond are common, at least among the better-known species, and probably throughout the family. Studies in Canada and Europe found that 22% and about 30%, respectively, of Barn Swallow nestlings had been fathered by a male other than the one feeding them. In the case of Purple Martins, it is the young males that tend to get cuckolded: in one study, up to 43% of chicks in the nests of yearling males were not the latter's offspring, compared with only 4% for adults. Females may benefit from copulating with other males by acquiring a genetically superior father for some of their offspring, and they may readily accept or seek out good-quality

extra-pair males. Older males are probably particularly attractive partners, as they have proven viability. Female Barn Swallows in Europe are more likely to seek out extra-pair matings if their own partner is a poor-quality, short-tailed male than if he is one with a long tail. Females may also find extra-pair mates that are genetically more compatible, or their behaviour is perhaps designed to increase the genetic diversity of their offspring. This is possibly the case with the Tree Swallow, which has one of the highest levels of extra-pair paternity known in the avian world. In various studies, 38-69% of nestlings of this species, in 50-87% of broods, were not sired by the male feeding them, and often several fathers had been involved in siring a brood. In contrast, one of the Tree Swallow's close relatives, the Mangrove Swallow, has a much lower incidence of extra-pair young, at 15%. This difference between these two *Tachycineta* species is thought to be due to the latter's lack of breeding synchrony, which means that there may be no fertile females available when a male is looking for extra-pair partners.

Males of several species often try to enter nests to copulate with the resident female. In one study of Northern House Martins, intruders appeared, on average, every ten minutes during the morning when the female was fertile. These males often have mates that have already laid a clutch, and they have therefore finished their own mate-guarding activities (see below). Opportunistic attempts at extra-pair copulation are also made away from the nest, as, for example, among Cliff Swallows at mud-collection sites. Mud-gathering females flutter their wings in order to prevent males from landing on them and copulating. Male Collared Sand Martins chase females at the colony, preferentially pursuing the heaviest females, which are the ones most likely to be fertile.

Male hirundines that gain paternity by cuckolding other males are generally already paired, and are often neighbours of the females with which they mate. Often present also at the breeding site are so-called "floaters", which are young, unpaired individuals looking for mating opportunities. The status of being a floater is sometimes only temporary. Purple Martin males with spare sites in their territory may eventually give one up to a persistent intruder, and older birds can even benefit from having young male neighbours, as they can cuckold them. In one study of Purple Martins, 13% of first-year males failed to obtain a mate, in contrast to only 4% of adult males and less than 1% of females. Unmated individuals may also hang around the nests of mated pairs while looking for an opportunity to replace or take over a partner. At Barn Swallow sites, these extra birds occasionally participate in mobbing predators, nest-building, incubation and brooding. In the case of Tree Swallows, unpaired floater males seem to do well out of this strategy, in one study fathering 13% of extra-pair nestlings. Because of the often intense competition for nest-sites among individuals of this species, there are often floater females, which sometimes become the second mates of polygynous males.

Competition for the chance to breed sometimes results in infanticide. With Tree and Barn Swallows, for example, a new male partnering a widowed female with young nestlings will kill the chicks so that the female will then mate with him. In addition, the killing of her brood may make a mother desert her present partner and mate with the killer. Moreover, female Tree Swallows looking for an opportunity to breed also commit infanticide.

As well as defending the nest-site, the male may actively keep intruders away from his mate, and his mate away from other males, during the egg-laying period in order to ensure that he is the father of her offspring. The extent to which males do this varies both within and among species. Some Purple Martins remain with their partner on trips away from the nest, whereas others rarely or never do so; first-year males that are good at such mate-guarding can thereby reduce the risk of being cuckolded. Males of the Barn Swallow and Violet-green Swallow stay close to their mate both at the nest and away from it, following her while she is feeding or collecting nest material, whereas Cliff and Tree Swallow males do not, concentrating instead on protecting the nest from trespassers or usurpers. In the latter case, the male may guard against being cuckolded by copulating more frequently with his partner: Tree Swallow pairs copulate, on average, 5·4 times per hour during the female's fertile period, compared with a mean of 0·3 times per hour for Violet-green Swallows. Nests need to be guarded against intruders intent on stealing nest material, destroying eggs, adding their own eggs, killing young nestlings, and taking over the site itself.

Conversely, once a male's mate has finished laying her own eggs, and is therefore no longer interested in extra-pair activities, he may go off to do some cuckolding himself. If he does not help with incubation, he has plenty of time in which to do this, but in



The mud-nest building hirundines use a unique construction technique, well illustrated by the nest being built by this pair of ***Northern House Martins****. First the pair find a suitable rough, vertical substrate, in this case the side of a building. Then they create a small projection by fixing mud pellets to the wall, thus forming the foundation for the eventual upward and outward growth of the final closed structure. Bouts of nest construction tend to take place in the morning, allowing each course to dry during the afternoon. Each layer is laboriously constructed from pellets of pure mud that are carefully worked into place with the bill to ensure that no air gaps weaken the structural integrity of the nest.*

[*Delichon urbicum urbicum*, Hortobágy National Park, Hungary. Photo: Günter Ziesler]

many hirundines the male does incubate to some extent. Given the opportunity, males may then reduce their parental care so that they can spend more time in pursuing other females. In Australia, for example, the male Fairy Martin (*Petrochelidon ariel*) takes a lesser share of incubation duties when there are plenty of fertile females available in the colony.

Pair-bonds often last only for the duration of the breeding season. Among resident species, however, the partners may stay together near the nest, roosting inside it, between breeding attempts. In the case of the migratory Barn Swallow, pair-members often breed together for more than one season if both survive, although unsuccessful pairs may split up. Purple Martins, in contrast, seem to form new pairs each year.

The nests themselves are in pre-existing holes, or in burrows excavated by the birds themselves, or are specially built structures of mud (see Systematics, Habitat). The hole-nesters exploit a remarkable variety of sites, including woodpecker holes in dead trees, termite nests, crevices in cliffs and caves, old burrows in riverbanks, ditches, road cuttings and quarries, holes in the roofs of buildings or in walls, chimneys, wells, crevices in streetlamps and traffic lights, pipes and nestboxes. The mud-nest builders also utilize a variety of substrates, such as trees, riverbanks, cliffs and caves, and many artificial structures such as bridges, culverts, wells, dams, mine shafts, and both the inside and the outside of buildings. The hirundines' flexibility in the sites that they use has resulted in some species nesting in unusual situations. Purple Martins, for instance, have nested in the moving arms of oil pumps and in a gourd fixed on the mast of a moving ship, and Barn Swallows have built nests on wasp nests, electricity wires, masonry bolts, nails and chains on walls, gear wheels and pulleys, picture frames, hats, pieces of cloth, lampshades and brackets, and even the corpse of an owl (Strigiformes).

Although sites of such a variety are serviceable, there are nevertheless several basic requirements for breeding purposes. As nest-sites need to be well protected from predators, they are typically high up, and often over water. Of 189 nests located in a study of Scottish Barn Swallows, 41% were 3-4·5 m above the ground, 38% were at 2-3 m, 16% were at over 4·5 m and only 5% were below 2 m. Mud nests are often built just below an overhang, again to deter predators, and also to provide shelter from inclement weather. Alternatively, in colonial species, they are frequently sited below an upper row of nests, often forming a honeycomb pattern. Caves, buildings and other dark places are often used, but probably for their inaccessibility and the protection that they offer from extremes of weather, rather than for the low light levels. In addition, a good source of wet mud is required for the building of mud nests, and a suitably rough substrate to which the material will adhere. The parents also need a clear flightpath to the nest entrance, for rapid access, and so they avoid dense vegetation. Moreover, they like to have a perch nearby on which to sing and preen.

For burrows, too, sites high up on banks are preferred, as these tend to be out of the way of predators and are less liable to collapse. Burrow-excavation is typically undertaken by both members of the pair, although it is started by the male, which arrives first. The birds use the bill to dislodge the earth, and then the wings and feet to remove it from the burrow, which is often 50-100 cm long. An enlarged cavity is made at the far end for the nest-chamber itself.

Similarly, mud nests are constructed by both partners. They start by fixing mud on to a vertical surface, creating a small projection, and then proceed outwards and upwards to form a cup or a closed or retort-shaped structure. In colonial species, the latter may allow pairs to nest close together, enjoying the benefits of living in a group, without the drawbacks of interacting with close neighbours and having intruders at the nest. Adjacent nests may also share a wall, thus reducing the time and energy invested in building. The shape of a mud nest often depends on where it is sited. Where South African Swallows use crevices, for example, they merely apply mud to reduce the size of the entrance and to create a tunnel. In North America, Cliff Swallows appropriate the burrows of Collared Sand Martins, known there as "Bank Swallows", in a similar manner. Among Cave Swallows in the south-west USA, open mud nests are usually built in natural cave sites and enclosed ones in artificial sites.

The birds collect mud as a pellet in the bill. They gather the material from a puddle or other suitable source, usually close to the nest-site, or they steal it from a neighbour's nest. When the bird applies the mud to the nest, it often vibrates its bill; this probably helps to disperse the wet mud into any air spaces, which would otherwise weaken the structure. A nest can contain over 1000 mud pellets. The majority of hirundines collect pure mud



*Together with its mate, this **Banded Martin** has completed the Herculean task of digging a nest burrow up to 90 cm long into a vertical bank. All that remains to finish the job off is to line the nest-chamber. Grass and other vegetation is picked up from the ground and moulded inside into a crude bowl. A final layer of feathers is often added and this provides important insulation for the eggs and young, especially during cold weather, when adults have to spend long periods away from the nest in order to collect adequate amounts of food. Discarded feathers are often caught in flight or grabbed from the surface of waterbodies, and they can be the cause of a great deal of competition and noisy squabbling.*

[*Riparia cincta xerica*, Xigera, Maun, Okavango Delta, Botswana. Photo: Peter Steyn/Ardea]

pellets, but the Montane Blue Swallow and the Black-and-rufous Swallow mix mud evenly with grass or rootlets and apply this mixture to the nest. Species in the genus *Hirundo* include vegetable fibres in the structure, whereas the species that make closed and retort-shaped nests generally construct these entirely with mud. Different types of nest are also composed of materials that differ in detail. In one study, it was found that Barn Swallows used mud with relatively more sand particles than that used by Cliff Swallows; sand may increase the strength of the nest and organic matter helps to bind the particles together, but they both make the mud less easy to work and so are less suitable for the more complex shape of the Cliff Swallow's nest. Cliff Swallows, given the choice of different muds, selected the one that was the most adhesive. Other material is sometimes incorporated. As an example, Cave Swallows nesting in caves where bats roost pick up both mud and guano from the cave floor.

Open cup-nests typically measure about 20 × 10 cm, with walls some 2-4 cm thick. The enclosed nest of the Northern House Martin measures approximately 18 × 10 cm and is 14 cm high, while the Red-rumped Swallow's retort-shaped nest is 18 × 18 cm, with a height of 10 cm, and with a tunnel 10 cm long. Nest dimensions of a given species can be quite variable, however, especially in tunnel length, that of Red-rumped Swallows ranging from 5 cm to 14 cm.

Within the burrow, hole or mud nest, the birds make a bowl of vegetable material, such as grass, dead leaves and twigs, collected from sites nearby or stolen from neighbours. Man-made substances, such as string, are sometimes incorporated, and even refrigerator insulation has been found in nests. Purple Martins begin by adding material to the floor of the cavity, after which they shape the bowl by spinning around and flattening the breast against the floor. They add fresh green leaves to the nest and mud to the base of the entrance hole, forming a wall between the hole and the nest. It is not clear why green leaves are added, but they possibly have an insecticidal function, helping to control ectoparasites. Some hirundines add a final lining of feathers, which can be important for insulation during incubation and the early nestling stage.

Nest-building can take several days to several weeks, with pairs arriving early often taking longer than do late-comers. The weather plays an important role, especially when wet mud is needed. Cliff Swallows also build more quickly if the nest abuts a neighbouring one and a wall is thus shared. Mud nests are often reused; in such cases, the birds may do no more than rebuild the rim or, if a tunnel is present, reconstruct that, and add a new lining. Nesting cavities and burrows are also sometimes reused. Old sites, however, are often avoided if they harbour parasites. Collared Sand Martins prefer to make new burrows in fresh banks each year, and will replace the old nest if they do reuse a burrow, while mud nests are sometimes left vacant for a season in order to eliminate parasites. Individuals will also switch to a different nest, or even a different site, after a failed nesting attempt. With Barn Swallows, and perhaps other hirundines, the male's nest-building activity is an indication of his potential investment in parenting, and females adjust the size of their clutch accordingly.

When cavities are scarce, hirundines often suffer competition for these nest-sites from other species, including other hirundines. Some usurpers can be thwarted: Purple Martins, for instance, are usually victorious in conflicts with Tree Swallows and Eastern Bluebirds (*Sialia sialis*). Others, especially House Sparrows (*Passer domesticus*) and Common Starlings (*Sturnus vulgaris*), are too aggressive and too persistent and eventually win the battle for ownership. Burrows are also attractive sites for other species, such as Swainson's Sparrow (*Passer swainsonii*), which has been seen to remove nestlings from the burrows of Plain Martins (*Riparia paludicola*) in East Africa. Mud nests, too, are sometimes usurped by other species, including, in the case of Cliff Swallow nests, Eastern Bluebirds, House Wrens (*Troglodytes aedon*), House Finches (*Carpodacus mexicanus*) and House Sparrows, the owners being evicted if the nest is active. In Africa, the White-rumped Swift (*Apus caffer*) frequently takes over the mud nests of swallows, such as the Rufous-chested Swallow (*Cecropis semirufa*), persistently attacking the nest if the owners are present or, if they are not, simply squatting and preventing their entry. Hirundines building nests on the same site, as do Barn and Cliff Swallows at times, also come into conflict, the Cliff Swallows being dominant in this example.

Hirundine eggs are generally white, as they do not need to be camouflaged inside a cavity. Some species that build a mud nest, however, have white eggs with reddish or grey/purple speckles or blotches, the markings usually concentrated at the broad end. This applies especially, but not solely, to those that construct an



*In **Pearl-breasted Swallows**, the task of incubating the eggs is undertaken by the female. This is fairly common amongst hirundines, although incubation is shared in some species. The clutch consists of two to four eggs, a single egg being laid each morning until the clutch is complete. Incubation lasts for 16-17 days, and the eggs hatch asynchronously over a period of days. As in many cavity-nesting birds, hirundine eggs are generally white. However some species, usually those which build open cup-nests, have coloured speckling on their eggs. In some species, opportunistic females attempt to increase their breeding success by dumping eggs in the nests of neighbouring females.*

[*Hirundo dimidiata marwitzi*, Marondera, Zimbabwe. Photo: Peter J. Ginn]

open cup-nest. Species in the barn swallow group, the three *Ptyonoprogne* crag martins, the Wire-tailed Swallow, and the blue swallow and cliff swallow groups (see Systematics) have spotted eggs; the eggs of the two striped swallows in Africa, along with those of the more widespread Red-rumped Swallow and its close relatives the Striated (*Cecropis striolata*) and Rufous-bellied Swallows (*Cecropis badia*), are sometimes spotted. The amount and the pattern of spots can vary within a species. Eggs do not vary substantially in size. Among the smaller species, those of the Blue-and-white Swallow measure 17·2 × 12·5 mm and weigh 1·4 g, the corresponding figures for the eggs of the large Purple Martin being 24·3 × 17·4 mm and 4·1 g.

Many hirundines breeding in temperate regions lay a clutch of four or five eggs on average, with a typical range of three to six. Sometimes they lay as many as seven or eight eggs, or as few as one or two. It is not always possible, however, to know if very small or very large clutches are the complete clutches of a single female, because adverse weather can disrupt laying, and because females will dump eggs into the nests of their neighbours (see below). In the tropics, two or three eggs are usual. Clutch sizes of more widely distributed species tend to be smaller at lower latitudes. For example, Red-rumped Swallows breeding in southern Siberia lay five or six eggs, but their conspecific representatives in Africa lay only two or three. Hirundines, in common with many other birds, also exhibit a decline in clutch size as the breeding season progresses. Although this is partly because young birds tend both to lay late and to have small clutches, there is also a real decrease in clutch size during the season. For example, Barn Swallows in a study in Scotland averaged 4·9 eggs in their first clutch and 4·36 in their second. The seasonal decline may in part be related to changes in food abundance and in the length of daylight available for foraging; increasing numbers of parasites may also have an effect.

Eggs are laid early in the morning, at a rate of one daily, although bad weather, and hence poor foraging conditions, can interrupt laying for a day or more, or result in anomalously small eggs. The weather also has some effect on the quality and number of eggs, through its impact on the food supply. With Barn Swallows, the amount of lipid in the egg depends on the abundance of insects during egg formation, and the size of first clutches is also related to the ambient temperature just before laying. Hirundines also seem to be risk-averse, producing a brood of a size that the pair can rear in an average year, although experiments have shown that, in good conditions, they are capable of rearing larger broods than normal.

Among the more solitary species, the laying period within a local population can extend over several weeks. This is both because some individuals arrive later than others in the nesting area and because some will have a second brood. In the case of the colonial Cliff Swallow, however, pairs nesting together all lay at about the same time. In some populations, such as Cliff Swallows in south-east Arizona, laying may be synchronized because it needs to coincide with favourable weather, in this instance the summer monsoon. Brown and Brown suggested that, for the majority of Cliff Swallows, laying was synchronous for the simple reason that all pairs nested early in order to avoid the build-up of parasites in the nest later in the season.

Females of some hirundine species deposit some of their eggs in the nests of their neighbours. The extent of this brood-parasitism is not clear, but it varies between populations within a species. In one Purple Martin colony in Maryland, a third of nestlings in the nests of first-years were from eggs laid by another female, whereas a study in Texas found no evidence of such brood-parasitism. In Brown and Brown's study of Cliff Swallows in Nebraska, nearly a quarter of nests contained one or more eggs laid by neighbours; in another study, however, only about 4% of nests



*The exposed interior of this **Collared Sand Martin** burrow allows a rare view into its nest. The nest-chamber has been crudely lined by the female with grass, rootlets and other plant matter, as well as a large number of feathers. Typically, a clutch of 4-5 eggs is laid, the eggs hatching asynchronously after 12-16 days. Recently hatched nestlings, such as these, are rather feeble, almost totally naked, and with their eyes closed. Because they lack feathers, the nestlings are unable to maintain their own body temperatures and require continuous brooding for the first few days and occasionally thereafter, until they develop rudimentary plumage. After their eyes open at about nine days old, they become increasingly active and rush to greet incoming food-laden parents, ultimately crowding together at the burrow entrance.*

[*Riparia riparia riparia*, Woodbridge, Suffolk, England. Photo: Eric & David Hosking/FLPA]



*The strident begging calls of these young **Barn Swallows**, coupled with the strong visual signals of the yellow gape and prominent pale yellow bill flanges send a strong message to their parents. These youngsters are well feathered and therefore require little brooding, but they do need a regular supply of food, which is brought to the nest by both parents. In the early stages of brood-rearing the parents are also responsible for keeping the nest clean by removing egg-shell fragments and faecal material, the latter being swallowed or dropped away from the nest. Young Barn Swallows are attentive, quickly learning the calls of their parents, and after about nine days respond to alarm calls by keeping quiet and crouching low in the nest.*

[*Hirundo rustica rustica*, Lancashire, England. Photo: Dennis Green/ Survival/Oxford Scientific Films]

were parasitized. DNA parentage tests of Barn Swallows and Collared Sand Martins have also revealed egg-dumping by extra-pair females that have mated with the male owner of the nest. Parasitic females either lay eggs directly in other nests or transfer them in the bill, and they sometimes destroy one of the host's eggs; they also rear a brood in their own nest. Such females may improve their breeding success by this behaviour or, by laying in more than one nest, they may reduce the chances of losing all their offspring in a poor season.

Whether pairs have one or two broods in a season varies both interspecifically and intraspecifically. Some species have just one brood, whereas others rear two or more. Cliff Swallows, for example, only rarely raise two broods, whereas Barn Swallows often produce two and sometimes three. An important determining factor is the length of the season, and, within a species, individuals that arrive early on the breeding grounds are more likely to raise more than one brood than are late arrivals. Second and third broods are also more common at low latitudes. On the other hand, reports of two or more broods being reared in a single nest are open to interpretation. Such cases could also involve either replacement clutches, when the first has been lost, or different sets of parents. Consequently, the number of breeding attempts made by pairs in a season is known for certain for only a few hirundine species, in cases where marked individuals have been followed over the course of a season.

Hirundine males show some of the highest levels of paternal care among passerines, in several cases sharing incubation duties with the female. In others, however, only the female incubates. There are also instances in which the roles played by the sexes differ from one subspecies to another. A good example is that of the Barn Swallow: the male of the North American race *erythrogaster* helps to incubate, although only to a small extent, but his Old World counterpart does not. Male Barn Swallows, unlike females, do not have a brood patch, while male Cliff Swallows, which do incubate regularly, have at most just a thinly feathered area or a few bare patches, which probably do little more than keep the eggs warm while the female is away. The male's contribution to incubation varies considerably; male Cliff Swallows, for example, incubate as much as do females, whereas male Collared Sand Martins in Scotland contribute about a third towards this process. Whether the male of a particular species helps may depend on how easily his mate can forage for herself. If the species' typical food supply is scarce or unpredictable, the female may not have the time both to incubate the eggs and to catch enough insects. Among some other avian species, the male brings food to his mate on the nest. This is not usual among hirundines, although it has been recorded on very rare occasions, as, for example, in the case of Eurasian Crag Martins.

Even if the male does not incubate, he may still sit on the eggs in the female's absence. Male Purple Martins do this, and can even be reluctant to relinquish the eggs when his partner returns from foraging. European Barn Swallow males, on the other hand, merely perch nearby and ignore the clutch. When the female alone incubates, she does so for about 70% of the daylight hours, more when the temperature drops and less in warm weather. Typically, incubation bouts last for 5-15 minutes and foraging periods away from the nest for just a few minutes, but, again, this depends on the temperature. Nevertheless, hirundine eggs can be quite tolerant of low temperatures and interruptions in incubation when adverse weather forces the parents to forage for hours at a time, rather than for minutes. The enclosed nests, the feather lining, the burrows and the sheltered indoor nest-sites of hirundines also help to maintain egg temperatures during inclement weather.

Associated with this division of labour is the timing of the start of incubation. When the male helps, incubation generally begins, at least intermittently, before the penultimate egg is laid, but it starts with the penultimate or last egg if he does not assist. This difference may be due to an inability of females to incubate unaided at the same time as they are producing eggs. On the other hand, different studies of one and the same species have reported different start times, perhaps suggesting some variability within species. In addition, females that incubate alone generally sit on the eggs for increasingly longer times during the laying period, possibly providing intermittent incubation. The clutches of most hirundine species appear to be incubated for about 14-18 days, the recorded range for the entire Hirundinidae family being 10-21 days. Because of the intermittent warming of the eggs during laying, however, it is often not clear when incubation has started. This



*This **Red-rumped Swallow** has been caught in the act of making a food delivery to its nestlings. Feeding young is an enormous task and at the peak of nestling development adults of this species have been recorded making as many as 138 food deliveries per day. Close examination reveals that this adult is carrying a small ball of food, consisting of compressed insects; this is either divided, between very young nestlings, or presented to just one, when the young are larger. Eggs hatch asynchronously and therefore the older, stronger nestlings naturally benefit by getting a larger share of the available food, with an increased chance of successfully fledging.*

[*Cecropis daurica rufula*, Spain.
Photo: José Ruiz/
Nature Picture Library]

makes calculation of the incubation period difficult, and values given in the literature may not always be accurate. Moreover, for a given species, the period can vary for a number of reasons, such as the presence of parasites in the nest in the case of the Barn Swallow, and reduced attentiveness in the case of the Fairy Martin.

The eggs usually hatch over one or two days, sometimes three. Tree Swallow eggs hatch more asynchronously in inclement weather, and for Barn Swallows the temporal spread increases at higher latitudes. Asynchronous hatching can be associated with substantial weight differences between nestlings in a brood. In Tree Swallow broods, for example, the largest nestling is on average 94% heavier than the smallest when the latter hatches. The earliest chicks to hatch are more likely to fledge.

On hatching, the nestlings are typically pink, with yellow inside the mouth and paler yellow or white on the bill-flanges. They usually have only scant tufts of white or grey down, principally on the head, wings and back, and the eyes are closed. The pin-feathers appear after a few days, and the primaries and tail feathers emerge from their sheaths at approximately 9-10 days. The eyes open gradually after about 5-6 days, and are fully open when the chick reaches 9-11 days. The nestlings are initially unable to regulate their own temperature, and they are brooded by either the female or both parents for the first few days, longer in bad weather than in good weather. Brooding is almost continuous for the first day or two, but decreases thereafter, ceasing altogether at about days 10-12, by which time the nestlings' feathers are breaking through and they are able to regulate their own body temperature.

Hirundines tend to grow slowly by comparison with other passerines. The most rapid growth occurs in the first week to 10 days, the nestlings reaching a peak in weight, greater than that of the adults, several days before they fledge, and then losing weight as a result of the maturing tissues losing water. Thus, the chicks of many species attain their highest weight at some 12-15 days, and those of Northern House Martins and the large *Progne* martins at 17-21 days. The nestlings often put on considerable amounts of fat, which tides them over during difficult periods. The amount of fat stored is related to the type of insects on which the species feeds and, therefore, the predictability or otherwise of the food supply. Northern House Martins, which feed on small swarming insects, are particularly likely to suffer from food shortages in bad weather (see Food and Feeding), but they are adapted to cope for short periods: the nestlings have sufficient fat reserves to last for a few days, and both nestlings and adults can become torpid in severe weather in order to save energy (see General Habits).

For their first few days of life, the chicks sprawl in the nest, raising the head to be fed. Their legs, wings and head grow rapidly during the first week or so, and they can then move and beg actively. Collared Sand Martin nestlings, brought up in burrows, begin to move forwards to meet the returning, food-carrying parents when about 9 days old, and at 15-17 days of age they wait at the burrow entrance. Barn Swallows, similarly, can hop up on to the rim of the nest by 14 days and preen themselves at 12-15 days. The fear response, crouching down in the nest when the parent gives an alarm call, develops at about 9 days.

Both hirundine parents feed the nestlings, often doing so about equally, and both are usually necessary for the successful rearing of the brood. In occasional polygynous matings, the second female is left to rear the brood alone. Female Tree Swallows, at least, are capable of achieving this at sites where food is abundant.

Each meal is a compressed ball, or bolus, of insects. With newly hatched nestlings, a parent may divide a food ball to feed more than one of them, but when the nestlings are older they feed one of them per visit. Small chicks may also be brought smaller and softer-bodied insects than those fed to older ones; the large *Progne* martins, in particular, deliver small flies and ants to young chicks, reserving dragonflies for older nestlings. Rates of 10-20 feeds per brood per hour would be typical, but feeding rates vary considerably, increasing with both the age and the size of the brood. Among colonial species, they also vary with colony size; some colonies may be too small for efficient social foraging, and in large groups the birds may compete for food. The main factor influencing feeding rates, however, is the weather. Scottish Barn Swallow parents will take only a minute or two to collect a meal of insects in good weather, but in poor conditions the average is six minutes and the parents are sometimes away for much longer. In turn, the weight of nestlings also varies with the weather and food abundance. Feeding rates gen-



Food provision is a non-stop task for the parents of these young ***White-throated Swallows****. Young hirundines lay down fat reserves during periods of food abundance and these can be important, both during the nesting phase and after fledging, when individuals may face temporary food shortages caused by inclement weather. If periods of bad weather persist, adults and young can enter a state of torpor to save energy while waiting for more favourable conditions to return. In exceptional conditions large numbers of birds can die during the breeding season, if successful foraging is hampered by cold or wet weather.*

[*Hirundo albigularis*. Photo: J. J. Brooks/ Photo Access]

erally increase as the brood grows, and then level off when the chicks reach peak weight, and decline slightly before they fledge. Very rarely, individuals other than the parents have been recorded as feeding the nestlings, as documented, for example, at nests of Barn Swallows and Welcome Swallows. These may be first-brood fledglings feeding their second-brood siblings, or unmated individuals that are unrelated to the nesting pair.

Nest sanitation is at first the responsibility of the parents, which remove the eggshells, dropping them well away from the nest, and consume or remove the faecal sacs of the young nestlings. After a week or so the nestlings begin to defecate over the rim of the nest, and by the age of about 12 days they deposit the majority of faecal sacs below the nest. Collared Sand Martin nestlings deposit their faecal sacs outside the burrow from about 14 days.

Both parents defend the eggs and nestlings from predators. Hirundines will join together in a group to mob birds of prey and other predators, but solitary and colonial species differ in their degree of participation. The more solitary Barn Swallows and Purple Martins emit alarm calls and dive at a predator that is close to their own nest, but they do not do so as a co-operative group. Other pairs circle or perch at a safe distance. Barn Swallows are particularly daring, approaching close to the predator and sometimes even hitting it. With the highly gregarious Cliff Swallow, in contrast, the birds in a colony gather above a predator and give alarm calls, but they do not dive at it.

As the fledging time approaches, the parents may begin to entice their brood out of the nest by means of contact calls or a more elaborate display. Northern House Martins start to do so when the nestlings are 19-24 days old, by flying slowly past the nest or hovering in front of it, perching nearby and calling, without offering any food. Eventually, the nestlings will follow a parent away from the nest, exchanging contact calls. It can take more than a day for the entire brood to leave the nest, and fledglings frequently return to it during the day, sometimes for several days, as well as roosting there. As a consequence, it can be difficult to calculate for how long the chicks stay in the nest. Further, growth rates and the nestling period can also vary with the weather, the abundance of food and the presence of parasites. With Barn Swallows, for example, the presence of mites (Acarina) in the nest can hasten fledging, but blowfly (Calliphoridae) larvae appear to reduce the nestlings' growth rate and delay fledging. For many hirundines, development from hatching to fledging takes about three weeks, while the large New World martins and the Northern House Martin require four weeks.

The parents typically feed their fledglings for several days. Those of the more solitary species generally move the brood to a secluded perch, such as a branch or wire, where they visit them with food. In contrast, the young of colonial species form crèches, which may be 2-3 km from the nest-site and contain hundreds of fledglings from several local colonies; parents recognize their own offspring in these crèches by their unique calls (see Voice). For the first few days, Barn Swallows perch beside their young in order to feed them, but later they often hover above the perch and the youngster flies up to take the food. Cliff Swallows transfer food to the fledgling's bill while in flight, or drop it for the young to catch.

Fledglings, often escorted by their parents, frequently return to the nest to roost for several nights. They begin to forage for themselves after four or five days, and become independent after a week to ten days. The family may then break up and the fledglings wander more widely, but this is not always what happens. Parents and young of Barn Swallows have been known to stay together for several weeks, and there are records of juveniles being fed by adults on migration, suggesting the existence of long-term bonds. In one particularly interesting case, a fledgling Welcome Swallow continued to roost in the nest while its mother laid and incubated her second clutch. Juveniles of the Cliff Swallow tend to keep in flocks with their peers, but both they and young Barn Swallows will visit other nest-sites and enter nests containing chicks, where they are fed by the nest-owners, which may not yet have learnt to recognize their own offspring. Barn Swallow fledglings have been recorded as visiting nests and breeding groups 5-8 km from their natal one, and juvenile Cliff Swallows have been found at colonies up to 60 km from the one at which they hatched. Juvenile Collared Sand Martins, too, are known to wander widely before migrating. These movements may allow the young birds to assess potential breeding sites and to familiarize themselves with local landmarks in preparation for their return in the following year (see Movements).

Hatching success for hirundine species breeding at high latitudes is often 90% or more. Fledging success is more variable,



*For tropical hirundines, such as the **Black Saw-wing**, rearing young to fledging is far from guaranteed. Clutch and brood losses appear to be much higher for tropical hirundines than for their more productive temperate counterparts. Presumably young Black Saw-wings enjoy higher survival rates during their first year than do temperate species that have to face the perils of a long and arduous migration to and from the wintering grounds. Species limits are uncertain across the large sub-Saharan range of the Black Saw-wing.*

[*Psalidoprocne pristoptera holomelas*, Somerset West, Western Cape, South Africa. Photo: Nico Myburgh]

depending, for example, on the weather conditions and the abundance of parasites, but it is often about 60-80%. In six studies of Purple Martins, 50-85% of eggs laid produced fledglings, with averages of 2·3-4·2 per pair. In one of these studies, however, in one year when the weather was cold and wet, only 18% did so, producing an average of only 1·2 fledglings per pair. Productivity varies considerably both from year to year and from one pair to another; a pair of Barn Swallows, for instance, can rear no young at all in a season or as many as 16. Tropical hirundines are less well studied, but they seem to suffer greater losses of clutches and broods. The fledging success of Pacific Swallows in one study, for example, was as low as 38%.

Hirundines are well prepared for short periods of bad weather and food scarcity. Cliff Swallow eggs, for example, can still hatch after several hours, and even a few days, of cold weather. As mentioned above, hirundine chicks have fat reserves, and nestling starvation is a significant cause of mortality only when the food shortage lasts for more than a few days or is combined with a high incidence of parasites in the nest. In a study of Barn Swallows at Cranberry Lake, in New York State, for example, the majority of first broods were lost during a period of cold, wet weather. Occasionally, local populations may even be wiped out, as happened to Purple Martins in the north-east USA in June 1972 as the result of a hurricane. Drought also limits the availability of insects, as well as of water, and affects the breeding performance of, for example, Cave Swallows in Texas. Some effects of the weather are more direct. Mud nests can be destroyed if soaked by rain or desiccated in hot, dry weather, and nestlings may also die if temperatures are too high.

For adults, weather-related starvation can be the main mortality factor during both the breeding and the non-breeding seasons. Drought in the wintering areas, with the concomitant loss of the food supply, may be responsible for the majority of deaths of adult Barn Swallows breeding in Europe, while cold weather in the spring may be an important mortality factor in parts of North America. Extreme weather may also select for birds with particular characteristics. In a six-day period of cold, wet weather in May, on the breeding grounds in the Great Plains of North America, it was generally the larger Barn and Cliff Swallows, having the least asymmetrical wings and tails, that survived. In a similar context, it is interesting to note that a decrease in body size of British-breeding Collared Sand Martins was recorded following a drought in the birds' wintering area in the African Sahel zone in 1983/84. For birds on migration, too, cold or stormy weather can be fatal, and hundreds of thousands of hirundines have been killed in some severe cases.

As mentioned several times in the preceding paragraphs, hirundines and their nests harbour a wide variety of blood-sucking and other parasites, some of which have highly deleterious effects on several aspects of the birds' breeding biology. Since hirundines avoid heavily infested nests, the presence of parasites can delay breeding by forcing them to build a new nest, instead of reusing an existing one. The parents may then not have time to produce a second brood. Parasites can also affect incubation time, the nestlings' health (compromising their immune response, the length of the nestling period, and survival after fledging), and adult survival. In some cases, the parasites reduce the growth rate of the nestlings; in others, their effect is more severe, leading to nestlings dying, perhaps directly from loss of blood or, in some instances, from the combined effects of parasites and food shortages. In particular, blowfly larvae, swallow bugs (*Oeciacus*), ticks, mites and fleas (Siphonaptera) are responsible for reduced growth and, sometimes, deaths of nestlings. In an experiment in which he manipulated the numbers of mites in nests, Møller found that 15-day-old Barn Swallows in nests infested with mites weighed about 5% less than did those in fumigated, mite-free nests. Fleas reduced the weights of Collared Sand Martin chicks by a similar amount. Swallow bugs are the main cause of nestling deaths for Cliff Swallows, especially those in large colonies and those breeding late in the season. Brown and Brown also found a difference in weight of up to 15% between parasitized and non-parasitized Cliff Swallow nestlings. In addition, swallow bugs transmit a virus to Cliff Swallows, and this, too, is more prevalent in large colonies. Other parasites of hirundines include hippoboscid flies, dermestid beetles, lice, nematodes, cestodes, trematodes and protozoans.

Although some swallows and martins do fall victim to birds of prey, in particular falcons (*Falco*), predation is not usually severe, especially for adults during the breeding season. Occasionally, however, an individual predator can have a large impact on a breeding group, and one bull snake (*Pituophis catenifer*) took some 150 eggs from a Cliff Swallow colony in only three days. Predators of hirundines include, besides raptors and snakes, owls, magpies (*Pica*), grackles (*Quiscalus*), woodpeckers, racoons (*Procyon*), squirrels (Sciuridae), rats (*Rattus*), weasels (*Mustela*) and cats. Some predators, such as grackles, pull chicks out of nests, and woodpeckers have been known to drill into mud nests in order to reach the contents. Opportunistic predation by Marabous (*Leptoptilos crumeniferus*) has also been recorded in Kenya, where dense flocks of Barn Swallows were feeding very low above the ground at Ngulia Lodge; the storks quickly lunged at and, occasionally, caught and consumed any swallows that flew too close to them.

Fire ants (*Solenopsis invicta*) also destroy eggs and nestlings, in one colony depredating a quarter of nests. In addition, some eggs and nestlings are lost when other species, such as Common Starlings and House Sparrows, or deer mice (*Peromyscus*), try to take over the nest-site. Infanticide also accounts for some deaths: in one study of Barn Swallows, 32% of deaths of nestlings over a five-year period were attributed to this cause.

The majority of individual hirundines start to breed when one year old and continue for only a few years, but some reach 8-9 years or more. Maximum lifespans are 12 years for Cliff Swallows and Tree Swallows, 13 years 9 months for Purple Martins, 14 years 6 months for Northern House Martins and nearly 16 years for Barn Swallows. Mortality tends to be highest in the first year. For example, annual survival rates in one study of Cliff Swallows were 57% for adults and 17% for first-years. Survival does, however, vary from one year to another, the annual rates for adult Cliff Swallows ranging from 47% to 64%, with survival better when summer temperatures are high and, in addition, rising with increasing colony size. For Barn Swallows and Collared Sand Martins, it varies in accordance with the weather in the winter quarters. Survival also depends on other factors, such as an individual's condition, quality and breeding effort. In the case of Barn Swallows, long-tailed males survive better than do short-tailed ones, and the number of nestlings reared can affect female survival.

Movements

Swallows and martins breeding in temperate regions generally migrate to warmer areas for the non-breeding season. Although their insect prey is abundant in spring and summer, it crashes with the low temperatures of winter, forcing the birds to move to regions where insects are still available. Barn Swallows from northern Europe, for example, migrate to Africa, and those from North America fly to South America. At lower latitudes, hirundines are often resident or make only short post-breeding movements, sometimes descending to lower altitudes. Some species breeding within Africa are migratory only in certain areas. One of these is the Lesser Striped Swallow, which is resident near the equator but migratory to the north and south of it. In some areas, hirundines are partial migrants, as typified by the Welcome Swallow: some Welcome Swallows are present all year in southern Australia, but there is also an influx of birds into northern areas after the breeding season in the south.

Hirundines migrate by day, often flying low down and feeding as they go. They move in loose flocks, sometimes containing hundreds or thousands of individuals. These can be seen throughout the day, but juvenile Barn Swallows tend to start earlier and finish later in the day than adults. Routes taken are usually over land or along coastlines with only short water crossings, but some Purple Martins and Barn Swallows in North America, for example, travel via the Gulf of Mexico and the Caribbean Sea. Individuals of some species are known to return to the same wintering site each year and generally remain in the same area throughout the non-breeding season, but wintering ranges can change. In the early 1960s, after a drought in northern South Africa combined with wet weather in the Karoo, Barn Swallows in southern Africa extended their winter range farther south and west.

Both autumn and spring migrations are staggered, and the timing of each often varies from year to year. The migration in autumn is leisurely and can take several months. Barn Swallows in Britain, for example, gradually travel southwards, moving from one roost to the next, and staying for a number of days at each site. They appear to proceed more quickly as autumn progresses, probably by spending less time at each stop and wandering less. In spring, however, individuals, especially adult males, usually move more quickly, in order to acquire a nest-site before the competition arrives. Migration can be accomplished very quickly: there are records for Barn Swallows covering a distance of 12,000 km in 34 days, a daily average of about 320 km, and travelling 3028 km in 7 days, which is the equivalent of 433 km per day.

The proportion of first-year individuals that return to breed at the place where they hatched varies, but these young birds tend to return to the same general area, although not necessarily to the same site. Moreover, males have a tendency to return to localities closer to the natal site than those to which females return. In contrast, older individuals frequently come back to the breeding site, and often to the nest, that they used in the previous season, especially if they were successful there. A large amount of the data on site-fidelity, however, is difficult to interpret, because it is not possible to distinguish between dispersal and mortality as the reason for an individual's absence. In addition, the pattern of dispersal will in many cases reflect the distribution of observers.



*Young **Collared Sand Martins** are encouraged to leave the nest by their parents, which perch close to the nest entrance and call repeatedly to entice them out. After taking their first flight, young birds frequently return to the nest, which they may continue to occupy for a number of days, as it provides a safe roosting location. As soon as the young become independent the adults join large communal roosts, and within a short time start their migration south to the wintering grounds. The youngsters however hang back and drift around, moving between roosts, perhaps learning the lie of the land, before they too finally migrate to the winter quarters.*

[*Riparia riparia riparia*, Burgos, Spain. Photo: José Luis Gómez de Francisco]



*Fledgling **Wire-tailed Swallows**, like all young hirundines, remain heavily dependent on their parents for a number of days after they leave the nest. In common with other solitary hirundines, the parents entice the young birds out to a suitable, safe perch, which they regularly visit with food. At first, the young are presented with food by perched adults, as illustrated here, but later on the parents encourage their young to fly and receive offerings. After 7-10 days, the young learn to fend for themselves, and become independent. Colonial species behave similarly but gather their young into large crèches and, unlike the solitary species, are able to identify the calls of their own young, in order to find and feed them.*

[*Hirundo smithii smithii*, Kruger National Park, South Africa. Photo: Rolf Kunz]

Juvenile Cliff Swallows are among the more philopatric of hirundines. Of those ringed in the year of hatching and recaptured in the following year, 48-74% returned to the natal site in three studies; others were found mostly up to 3·5 km away, and some as far as 77 km from the hatching site. In contrast, only 1% of ringed Purple Martin nestlings in a study in north Texas, and 5% in Ohio, returned to the natal site to breed. Similarly, 0-4% of Barn Swallow nestlings returned to the locality in the following year, with more males than females doing so. Of adult Cliff Swallows caught in one year, 45-82% bred at the same site as in the previous year, while adult Barn Swallows are highly faithful to their breeding site, almost 100% returning to it in subsequent seasons.

Hirundines are often recorded in places outside their normal range, sometimes as rare vagrants but at other times more frequently. In several instances, such phenomena have led to eventual expansion of the breeding range. Welcome Swallows from Australia, for example, had been recorded in New Zealand since the 1920s and started to breed there in 1958. Since then, the species has become a widespread and common breeding bird, both on the two main islands and on smaller offshore islands. In the New World, Cave Swallows have occurred as vagrants as far north as Nova Scotia, on the eastern Atlantic coast, and it is interesting to note that this largely Middle American species has, over the last hundred years or so, expanded its breeding and non-breeding ranges northwards into southern North America. In Europe, the Red-rumped Swallow and the Eurasian Crag Martin have also moved north in the last century, both as vagrants and as breeding birds.

Long-distance, transoceanic vagrancy is also recorded on rare occasions. Both the Tree Swallow and the Cliff Swallow, for instance, have been observed on a handful of occasions in Europe.

Relationship with Man

Hirundines have a long association with humans, some species having nested on artificial sites for hundreds or, in some cases, even thousands of years. There are Danish subfossil finds 5000 years old from Neolithic flint mines, and the Roman poet Virgil wrote of a swallow, presumably the Barn Swallow, nesting in the rafters of a house. Having nested close to people for so long, the Barn Swallow, not surprisingly, features in many legends and customs, nearly always as a virtuous bird. It is the quintessential harbinger of spring, enshrined in the proverb "One swallow does not make a summer", and its arrival is associated with several customs. In Bohemian folklore, for example, unmarried women who see a pair of swallows will marry in that year, although single men need see only one swallow in order to acquire a bride.

Because they arrive back in Europe at about Easter time in the Christian calendar, Barn Swallows have become associated with the Crucifixion of Christ. Various legends tell of how they attempted to lead astray those coming to arrest Jesus Christ in the Garden of Gethsemane, of how they tried to remove His crown of thorns, or the nails from the cross, to wipe the blood from His wounds, and to console Him. In another, magpies pricked Christ's feet with thorns, while the swallows removed them, with the result that swallows were granted safe lodging in people's homes. The swallows' role in helping humans, however, extends farther back than this, and across many more cultures and religions. A swallow is said to have reunited Adam and Eve after their expulsion from Eden, and Noah is alleged to have released a swallow after the Flood to signify a new era. Swallows are mentioned in the *Koran* as attacking Christians who were besieging Mecca. In both European and Asian mythology, swallows stole fire from the gods and brought it to humans on earth, losing the middle tail feathers in the process. Different legends claim that "Tengri the Sky Being" struck the tail with an arrow, or that the Devil burnt it with a firebrand, marking the throat and forehead red, too, or that sparrows which were supposed to be guarding the fire pecked out the tail. Alternatively, the Snake in Eden is said to have bitten it out, or Thor tore the tail with a thunderbolt. In Russian mythology swallows are spirits of dead children, and in parts of Africa they are messengers sent from deceased ancestors to bring comfort to the living.

Goddesses have been transformed into swallows on several occasions. Athene became one in order to remain hidden when her suitors were killed, and Isis fluttered as a swallow over the resting place of her husband Osiris. Another relevant story concerns the Greek Tereus, who fell in love with Philomena, the sister of his wife Procne, raped her and cut out her tongue in order to stop her telling on him, but she managed to inform her sister and the two ran off together. They asked the gods to save them from Tereus and were turned into a swallow and a nightin-

gale (*Luscinia*), respectively. Without her tongue, Philomena, the swallow, can now only twitter. In an alternative version of the legend, it was Procne who became the swallow, and her name is now the basis of the scientific generic name for the American martins, *Progne*. In ancient Egypt, the swallow was a minor deity, and was often mummified.

Swallows are usually viewed as good omens. A widespread belief is that a pair nesting in the house brings good luck, and people in China even put up ledges inside their houses to encourage the birds to nest. Destroying a swallow or its nest, however, attracts misfortune, such as that cows will produce bloody milk, or none at all, or that lightning will strike the house. Nevertheless, swallows are sometimes considered a bad omen, foretelling a death, or even a disaster, as, for example, those nesting on Cleopatra's flagship before the Battle of Actium.

Barn Swallows also feature in a number of folk remedies from both Europe and Asia. On the principle of curing like with like, this species, with its twittering song, has been used in cures for speech impediments, as well as for such other ailments as epilepsy, headaches, and eye and kidney problems. The heart of a swallow, eaten or hung in a bag around the neck, was thought to improve a person's memory. A European legend concerns a "swallow stone", said by Pliny to be found in the stomach of the oldest nestling in a brood of swallows, which could cure blindness, epilepsy and slurred speech. There are many versions of the story, one being that the female swallow, if one blinds her nestlings, will bring the stone to the nest in order to cure them. In some versions, there are three stones of different colours and with different properties, such as that of making the owner of the stone fairer or more attractive to a lover, that of providing protection from danger, or that of improving memory.

The involvement of hirundines with humans in the Americas is less well known. One species, at least, the Purple Martin, had some spiritual or ceremonial significance to the Omaha Indians who lived in Nebraska: six bodies of these birds were part of the Sacred War Pact kept in the Tent of War. In addition, in the southeastern part of the United States, natives ground up the bodies of Purple Martins and Belted Kingfishers (*Megaceryle alcyon*) and placed the powder on their pelts before overwinter storage, although it is not known whether the powder acted as an insecticide. Barn Swallows are known to have been nesting in native American settlements in the early 1800s, and probably long before that. In Mexico, Cave Swallows nest in Mayan ruins on the Yucatán Peninsula, and perhaps elsewhere; it is not known how long ago this habit developed, but it may have facilitated the species' move to modern buildings, bridges and culverts.

In the nineteenth century, Barn Swallow feathers were used in the millinery trade. Concern over this led indirectly to the founding of the American Audubon Society and, thus, to the early stages of the conservation movement. In some places, especially in Africa and Asia, swallows and martins have been, and sometimes still are, caught for food, and nestling Collared Sand Martin chicks have even been used as bait by fishermen (see also Status and Conservation).

People usually welcome swallows and martins when they nest in or on their houses and other buildings. In the past, the birds and their nests have also been protected by superstition. In most cases, the hirundines are allowed to nest where they will, and doors or windows may even be left open so as to provide an entrance for them. Only a few species, however, are actively encouraged by the erection of nestboxes (see Status and Conservation). One particularly noteworthy example is the Purple Martin, which has become a regular garden-breeding bird in both town and country; indeed, its popularity in eastern North America has given rise to a whole industry of bird-house construction, as well as two organizations devoted to the species. Native Americans first attracted Purple Martins by putting up hollowed-out gourds as nesting sites for them; the martins may have provided a warning of the approach of predators, as well as perhaps feeding on unwelcome insects. The birds soon started to use nest-sites provided by European settlers, and in the eastern part of the range they now rarely use natural ones. Manufacturers of the bird houses claim that the Purple Martins will eat large numbers of mosquitoes, but there is no evidence that they do.



*Hirundines, such as **Tree Swallows**, that utilise temperate regions during the breeding season are forced to be migratory. They avoid the impossible foraging conditions during the temperate winter by moving sometimes enormous distances to more equable and food-rich tropical and subtropical regions. Tree Swallows, for example, breed in north and central North America and migrate to winter quarters along the southern coast of the USA, the Caribbean and the coastlines of Central America and northern South America. Huge flocks assemble at post-breeding roosts and eventually the birds start to move south during the day, staying in loose flocks that feed in transit and come together each evening at a new roost, until they finally reach their wintering grounds. The distance covered per day during migration tends to vary seasonally.*

[*Tachycineta bicolor*, Florida, USA. Photo: Roland Seitre]





*Over large parts of its range the **Purple Martin** has a unique relationship with man and only uses artificial nestboxes specifically provided for it. Native Americans first encouraged this habit by hanging hollowed out gourds in their villages and many of today's artificial nests still resemble the early prototype, albeit mimicked in modern materials. It is not surprising that swallows and martins are so popular, as many people around the world live in close proximity to these birds, even sharing their homes with them, while for those people living in temperate latitudes there are few more rapturously received migrants after a long winter. Hirundines in such situations are true harbingers of the warmer summer days to come.*

[*Progne subis subis*, Burr Ridge, Illinois, USA. Photos: Rob Curtis/ The Early Birder

Hirundines are not usually considered to be pest species, but they are sometimes a nuisance. Some people object to the faeces that accumulate at such breeding sites as porches and garages, and they destroy the nests, although the problem can often be solved by simply putting up a board or sheet beneath the nest. Roosts on building ledges or on wires or trees in towns can be a more serious problem, and not just because of the birds' faeces. At a site in Mexico, for example, Purple Martin roosts are so large that they cause the electric wires to break, and people consequently kill the birds.

It is difficult to estimate the beneficial effects that swallows and martins may have in terms of their influence on the human environment. They certainly take huge numbers of insects, especially when provisioning nestlings, and they will often feed on temporary concentrations of prey, which may be useful to their human neighbours during an infestation of a pest species. There is no doubt that they take many injurious species. Barn Swallows in the USA, for example, have been recorded as eating cotton boll (*Anthonomus grandis*) and rice weevils (*Sitophilus oryzae*), codlin moths (*Cydia pomonella*) and cutworm moths (*Agrotis*). Their true value in controlling pest species, however, is not known. The good that they do may also be countered, at least in part, by their consumption of beneficial insects.

Relatively recently, hirundines, especially Tree Swallows, have been investigated as possible biomarkers of the presence of pollutants, which can accumulate along a food chain from insects to insect-eaters. While a single insect may contain a small amount of a pollutant, a swallow, eating large numbers of the insect, can build up a high concentration. The biological effects of pollutants and contaminants in an area, such as an old mining site, will be reflected in the hirundines foraging on the insects at that locality.

Status and Conservation

Of the 83 species of Hirundinidae currently recognized, five are considered to be globally threatened. A further four are listed as Data-deficient, a reflection of the lack of knowledge of the biology of many species in this family.

The conservation status of one hirundinid species is Critical. The White-eyed River Martin, first discovered as recently as 1968, at a single roost-site in Thailand, is known from only a few specimens and sightings, but it may already be extinct. Numbers of hirundines present at the roost have decreased dramatically because of habitat loss and trapping for food, and this species has not been seen since an unconfirmed report in 1986. Its breeding range and habitat requirements are unknown, although it may nest on sandbars along forested rivers, as does its sole congener, the African River Martin. Surveys along potentially suitable rivers in north Thailand and north Laos, however, have not provided any signs of the species. Likely breeding areas have been drastically affected by deforestation, the damming of rivers, and the spread of intensive agriculture and human settlement, as well as by direct disturbance in the form of hunting, fishing and sand-dredging. These activities have reduced the numbers of riverine birds in general, and perhaps, therefore, those of the White-eyed River Martin, too.

In the Caribbean, both the Bahama Swallow and the Golden Swallow have small and fragmented breeding ranges and declining populations, and both are regarded as Vulnerable. The Bahama Swallow, having a total population estimated at 2400 pairs in the late 1980s, not only faces the threat of habitat loss through logging and housing development, but also suffers severe competition for nest-sites from introduced House Sparrows and Common Starlings. It may have already ceased to breed on New Providence. Previous logging of its pine-forest habitat has probably greatly reduced the number of available breeding sites in the Bahamas; although logging is not currently being carried out, the secondary forest is now close to the stage at which such operations may be started again. One potential method of helping to conserve hirundines is to put up nestboxes as alternative nest-sites, as many species will take to these (see below). A nestbox scheme on Grand Bahama in 1995, however, was unsuccessful, with 227 boxes attracting only three pairs to breed.

Farther south in the Caribbean, the Golden Swallow, occurring on Jamaica and Hispaniola, has also lost its forest habitat to agricultural expansion. Once common, it has declined dramatically in numbers since the late nineteenth century, and its global population is now estimated to be in the range of 2500-10,000 individuals. On Hispaniola, its forest habitat has been whittled away by the practice of shifting agriculture, and this loss of habitat is likely to be involved in the species' decline on Jamaica, from where few recent records are known. Unlike the Bahama Swallow, the Golden Swallow seems to be subject to only little competition for nest-sites with the introduced Common Starling, which nests at lower elevations.

Two Afrotropical swallows are also listed as Vulnerable. The Montane Blue Swallow, which has a small population, estimated at about 2000 pairs in 1998, is an intra-African migrant that spends both the breeding and the non-breeding seasons in grassland. This habitat is threatened by afforestation, cultivation, livestock grazing and burning, and also by the invasion of non-native wattle (*Acacia*), pine and bracken (*Pteridium*); small-scale mining is a further potential threat. These encroachments on the species' habitat are thought to be responsible for the population decline, and they continue to give cause for concern.

The White-tailed Swallow, breeding within a very small range of less than 15,000 km^2 around Mega and Yavello, in southern Ethiopia, appears also to be at risk because of clearance of its bush habitat for grazing. Only low numbers of this swallow have been recorded in recent surveys. The species is poorly known, however, and there is an urgent need for additional, reliable data on its population size and its response to habitat change.

The African River Martin, Brazza's Martin, the Sinaloa Martin and the Red Sea Swallow (*Petrochelidon perdita*) are placed in the conservation category of Data-deficient, as they are too poorly known to be categorized more precisely. The first three appear to have limited distributions, with their population sizes inadequately known. The African River Martin occurs in Gabon, PRCongo and DRCongo and may be quite common, if local. Colonies of up to about 800 birds have been recorded, and large flocks on migration have included one of about 15,000 individuals. Nevertheless, very little information is available on the biology of this species, and recent discoveries of colonies in Gabon and PRCongo emphasize our lack of basic knowledge of its range. Brazza's Martin also breeds in central PRCongo and southern parts of DRCongo, as well as in the extreme north of Angola, but it is found in only small groups and hardly anything is known about its biology or current status. Both the African River Martin and Brazza's Martin are probably subject to a degree of human predation.

In America, the Sinaloa Martin, which is sometimes treated as a subspecies of the Caribbean Martin, breeds at just nine sites in the Sierra Madre Occidental, in western Mexico. Its wintering areas are not known, but observations of the species on the Pacific coast, and farther south, suggest that they may possibly lie in South America. Irrespective of whether this is a full species or a race of the Caribbean Martin, its small range justifies the concern about its conservation status.

The Red Sea Swallow is even more enigmatic. It is known from just a single specimen, found dead at Sanganeb lighthouse, off the coast of Sudan, in May 1984, and, possibly, a few sightings. Just before this type specimen was obtained, two swallows, perhaps of the same species, were seen as they flew over the Red Sea towards Jedda. The whereabouts of this swallow's breeding quarters are a mystery; it has been suggested that they may be in the Red Sea hills of Sudan or Eritrea, or along the coastal hills of western Saudi Arabia. Otherwise, several cliff swallows have been recorded in Ethiopia, including about 20 at Lake Langano, 3-8 in Awash National Park and, recently, others at a further three sites. Although it has been thought that these Ethiopian birds could be Red Sea Swallows, some observers believe that they may well be of a different and, as yet, undescribed hirundine species.

Apart from the above-mentioned species, the Mountain Saw-wing may also be of concern. It occupies an exceedingly small range in western Africa, being confined to Mount Cameroon, in west Cameroon, and the nearby island of Bioko. It appears, however, to be quite common within this tiny range, where it occurs in a variety of habitats, and it may not be under any immediate threats. Nevertheless, this situation could change, and any adverse modification of these habitats could easily put the Mountain Saw-wing at risk.

Other species of hirundine generally have more healthy populations, and some are extremely common and widespread. Even so, they can be subject to local threats, such as habitat loss. Some species are on local Red Lists. One example is the Purple Martin in British Columbia, although this population is increasing as a result of the provision of nestboxes (see below). In addition, the Barn Swallow and the Collared Sand Martin are listed as species of European conservation concern because of widespread declines in their populations.



*The stunning **Montane Blue Swallow** is one of five hirundine species listed as globally threatened. It is a migratory African species which has a small, declining population, which during the breeding season is totally dependent on montane grassland. Throughout its disjunct range such habitat is under threat from plantation forestry, cultivation, overgrazing, fire and the invasion of alien plant species. In addition to these problems, Montane Blue Swallows also occur at naturally low densities and have rather fussy nesting-cavity requirements.*

[*Hirundo atrocaerulea*, Kaapse Hoop, Mpumulanga, South Africa. Photo: Geoff McIlleron/ Firefly Images]

Where populations are threatened, this is due mainly to habitat loss and degradation but, on a local level, a variety of other factors, such as disturbance, nest-site competition, pollution and pesticide usage, and extreme weather conditions, may be involved. All of the five globally threatened species mentioned above have been affected by a reduction in suitable habitat, as a result, for example, of logging of forest or clearance of bush and grassland for conversion to grazing or other uses.

Competition for nest-sites can have a serious impact on local populations, as is the case for the Vulnerable Bahama Swallow. Human activity often makes this competition more severe, not only through the removal of trees and other suitable sites but also through the introducing of competitors such as House Sparrows and Common Starlings. These species' aggressiveness and persistence allow them to usurp holes and drive away hirundines. In addition to chasing the latter, they also stuff vegetation into the hole, thereby preventing other birds from using them, and throw out any eggs or small nestlings that are already present. In one study of Barn Swallows, House Sparrows reduced the fledging success of the population by 45%. These introduced species may have been involved in declines in Purple Martin and Cliff Swallow populations since the nineteenth century. In Poland, competition with House Sparrows is thought to have driven Northern House Martins to change their nest-sites from the outside to the inside of buildings.

The threats to hirundines are mainly incidental to human activity, but direct persecution is also evident. Large numbers of both adult and nestling African River Martins are taken by hunters in DRCongo, and hirundines are caught at winter roosts in Africa, Asia and probably South America, this human pressure having contributed, for example, to the probable extinction of the White-eyed River Martin in South-east Asia. In Europe, hundreds of thousands of migrating hirundines, along with many other species, have also fallen victim to hunters, especially in Malta, in a single year. While some birds are taken for food, or for sale in the local markets, many are shot merely for target practice. Roosts are also vulnerable to incidental poisoning by avicides used to control seed-eating pest species. Historically, too, there are cases of people killing hirundines for particular purposes, such as nestling Collared Sand Martins being taken for fishing bait and Barn Swallows being used in medicines (see Relationship with Man).

The close association of many hirundines with humans also results in frequent accidental deaths. Those species nesting on bridges and in culverts, in particular, are sometimes hit by vehicles. Deaths resulting from flying against or hitting buildings, windows and wires are less common, but they do occur. Juveniles are most vulnerable to these types of accident.

Pesticides and other pollutants in insects can affect their predators, such as hirundines. Tree Swallows have exhibited such biochemical effects as inhibition of cholinesterase, although this is not always reflected in reduced breeding success. In a study in New York S0tate, however, adults breeding at PCB-contaminated sites along the Hudson River abandoned their eggs more commonly, and also hatched fewer eggs, than did populations of the species breeding at other New York sites. Tree Swallows may also be affected by acid rain, as they produce comparatively fewer and smaller fledglings in acidic wetlands, perhaps as a result of fewer sources of calcium. In another example, post-mortem analyses revealed that the bodies of Barn Swallows nesting along a highway in Maryland, USA, contained higher concentrations of lead than did those of their rural counterparts, although their breeding success did not appear to suffer.

A more important effect of environmental biocides is likely to be the decline in insect abundance, and the consequent loss of food, where insects are eliminated by pesticides or their foodplants destroyed by herbicides. In a recent study in Scotland, T. Benton and his colleagues found that, over a 27-year period, the numbers of arthropods caught in a suction trap were related to agricultural practices such as the use of pesticides; the more intense the farming, the fewer the arthropods. In turn, farmland bird numbers were low when farming was intense and their prey scarce. In contrast, the control of air pollution during the twentieth century, leading to an improvement in air quality, has probably led to an increase in the supply of insects in some areas, thus allowing hirundines to spread. In Britain, for example, Northern House Martins returned to breed in Inner London following the implementation of the Clean Air Act of 1956.

A number of measures can be taken to improve a species' breeding success and increase its numbers, at least locally. These include the controlling of House Sparrow numbers, the removal of old nests that contain ectoparasites in order to prevent the build-up of these, and the provision of artificial nests or nest-sites. To most people, the erection of nestboxes is probably the most familiar method. Those species that build mud nests are perhaps the least suited to using a box, although artificial nests for Barn Swallows and, in particular, Northern House Martins have had some success, and are available commercially, while boards erected at strategic sites can also provide a suitable starting point for a Barn Swallow's nest. In some areas Cliff Swallows readily use plaster nests, and burrowing species, such as the Collared Sand Martin, will nest at specially constructed sites containing pipes or other artificial tunnels. Species that use tree holes or other cavities for breeding often readily accept nestboxes, but usually in rural contexts. The Purple Martin is a notable exception, being a regular user of boxes in urban gardens, as well as in the countryside (see Relationship with Man).

Habitat change resulting from human activities is a mixed blessing for hirundines. Logging and forest clearance have removed many potential natural sites for cavity-nesters, but species that have adapted to using artificial sites have benefited from the expansion of cultivation and human settlements, roads and railways, sometimes spectacularly so. Barn and Cliff Swallow populations, for example, were probably small, and restricted to areas with cliffs and caves, before these species began to nest on buildings and bridges; they have expanded their ranges as a result of their association with humans. Conversely, the intensive farming methods employed on many modern farms can be detrimental to hirundines; not only are insects frequently eliminated by pesticides, but hedges and trees are often removed, and with them the good feeding sites that tend to surround them.

Some species, or local populations, rely almost entirely on artificial sites for nesting, and modern reports of, for instance, Barn Swallows, Northern House Martins or eastern Purple Martins using natural nest-sites are scarce. Other members of the family use both natural and artificial sites, as and when they are available. The appearance of new sites, such as newly constructed bridges, can increase local population sizes and ranges, as has been noted with, for example, the Wire-tailed and Rufous-chested Swallows in Africa. Range expansions of several species have been particularly noticeable over the last century or so, especially in North America, where the Barn, Cliff and Cave Swallows now have much wider breeding distributions than they once did. Some hirundines, however, such as the Black-and-rufous Swallow in the Afrotropics, have benefited little or not at all from the advent of artificial nest-sites. This is either because such sites are scarce or because the birds have not yet changed their innate nesting habits.

A consequence of the exploitation of artificial nest-sites is that species which formerly occurred in different places can now be found nesting side by side. This is the case, for example, with Barn Swallows and Cave Swallows in south-west USA, where the latter species is spreading north. This may lead to competition for local resources and even to the two swallows hybridizing, possibly by males of one species forcing extra-pair copulations on females of the other (see Breeding).

General Bibliography

Barker *et al.* (2001), Beal (1918), Benton *et al.* (2002), Bock (1994), Brooke (1972a, 1974a, 1974b), Bryant (1985), Cracraft (1981), Dickinson & Dekker (2001b), Dickinson, Dekker, Eck, Somadikarta, Kalyakin *et al.* (2001), Garrod (1877), Gaunt (1969), Gómez (1988), Hails (1979), Hansell (2000), Lowe (1938), Lyuleeva (1973), Martin *et al.* (2001), Matyjasiak & Jablonski (2001), Mayr & Bond (1943), Mayr & Greenway (1960), Mayr & Short (1970), McFarlane (1963), McKitrick (1993), Møller *et al.* (2001), Moreau (1966), Prigogine (1985), Read (1991), Sharpe & Wyatt (1885-1894), Sheldon & Gill (1996), Sheldon & Winkler (1993), Sheldon *et al.* (1999), Shields *et al.* (1988), Sibley (1996), Sibley & Ahlquist (1982, 1990), Sibley & Monroe (1990, 1993), Sibley *et al.* (1988), Turner & Rose (1989), Vaurie (1954b, 1955), Waugh (1978), Winkler & Sheldon (1993, 1994).

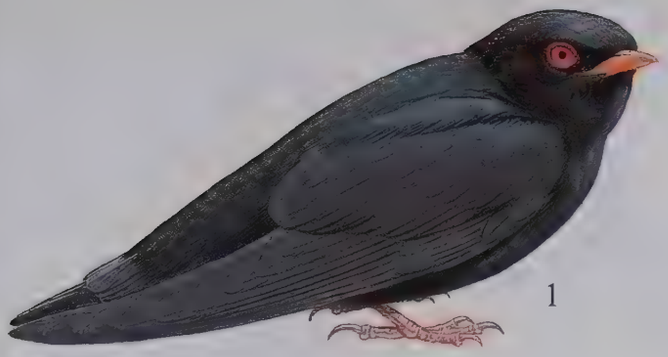


PLATE 62

inches 3
cm 8

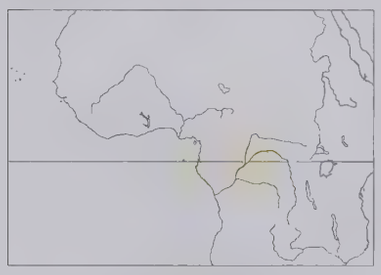


Subfamily PSEUDOCHELIDONINAE
Genus *PSEUDOCHELIDON* Hartlaub, 1861

1. African River Martin
Pseudochelidon eurystomina

French: Pseudolangrayen d'Afrique **Spanish**: Avión Ribereño Africano
German: Rotaugenschwalbe

Taxonomy. *Pseudochelidon eurystomina* Hartlaub, 1861, Gabon.
Monotypic.
Distribution. W Gabon (Gamba, Animba and near Libreville) and PRCongo (Conkouati Reserve), and DRCongo (upper and middle R Congo, lower R Ubangi).



Descriptive notes. 14 cm. Plumage is mostly blue-black or purple-black, with green sheen on back; tail black and square, central pair of feathers slightly pointed; sooty-brown underwing-coverts; bill large, orange-red; eye red, pink eyering; feet brownish-pink. Sexes alike. Juvenile is dull sooty-brown, greyer below. Voice. Song is a jingling noise given during displays; flight call described as "kee-r-r" or "chee-chee-chee" and "chattering" call recorded in resting flock.
Habitat. Forested rivers, coastal savanna. Feeds high over forest and along rivers. Roosts in reedbeds or in vegetation along rivers; also recorded roosting on buildings.
Food and Feeding. Mainly flying ants (Hymenoptera) recorded in analyses of stomach contents; also takes lycaenid butterflies, moths and other small Lepidoptera, flies (Diptera), beetles (Coleoptera), various hymenopterans, bugs (Hemiptera) and termites (Isoptera). In faeces and pellets collected in a breeding colony in Gabon, 65% of items were winged ants and 24% were termites. Usually seen in flocks. Flight rapid, with some gliding.
Breeding. Eggs and nestlings in Feb-Mar in DRCongo; breeding activities in Sept-Nov in Gabon and PRCongo. Colonial, colony sizes c. 800 birds on R Congo, 20-600 birds in Gabon, in one case using same site as Rosy Bee-eater (*Merops malimbicus*); at a Gabon colony, 2-3 pairs/m^2 and up to 9 holes/m^2, although probably not all holes in use. Nest in hole in sandbar in river (DRCongo), in grassy sand ridge near coast, or on gently inclined surface on coastal plain (Gabon), digs own burrow, but may also use existing bee-eater burrow; four burrows in Gabon 130-179 cm long (average 152 cm), nest-cavity 50-80 cm (average 66 cm) below surface; nest made of leaves, twigs, copal tree seed pods (DRCongo), or grass (Gabon). Clutch 3 eggs; no information on incubation and brood-rearing periods.
Movements. Migrates between the two breeding areas. Present in DRCongo mid-Dec/Jan to Apr/May; main passage across Gabon in Jun to early Sept, although begins as early as Apr, returning from late Oct to Nov but mainly Dec-Mar. Present in Gabon (Gamba) from mid-Aug, and on coast of PRCongo from mid-Sept. Not known if same birds breed at both sites or spend non-breeding season at one of them.
Status and Conservation. Not globally threatened. Data-deficient. Breeding area possibly more extensive than originally thought; only recently discovered near Libreville (Gabon) and in Conkouati Reserve (PRCongo); other stretches of coastal Gabon may also hold colonies. Occurs in large numbers on breeding grounds, also on migration in Gabon, e.g. a flock of c. 15,000 seen in 1997; smaller numbers seen on passage in N PRCongo, and in 1994 3-4 also observed in Central African Republic. In DRCongo, large numbers of adults and nestlings taken for food by local people; this hunting pressure possibly increasing. Breeding colonies vulnerable to flooding; on R Congo nesting sites exposed only in Feb-Mar and Jul-Aug.
Bibliography. Alexander-Marrack (1994), Bannerman (1939, 1953), Borrow & Demey (2001), Brosset & Érard (1977, 1986), Chapin (1953, 1954), Christy & Clarke (1994), Dean (2000), Dowsett (1989), Dowsett & Dowsett-Lemaire (1991, 1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (1999), Érard (1981), Fishpool & Evans (2001), Fry (1992), Keith *et al.* (1992), Lippens & Wille (1976), Mackworth-Praed & Grant (1973), Maisels & Cruickshank (2000), Pedersen (2000), Schouteden (1922), Sinclair (1998, 2003), Stattersfield & Capper (2000).

2. White-eyed River Martin
Pseudochelidon sirintarae

French: Pseudolangrayen d'Asie **Spanish**: Avión Ribereño Asiático
German: Weißaugenschwalbe

Taxonomy. *Pseudochelidon sirintarae* Thonglongya, 1968, Bung Boraphet (or its immediate vicinity), central Thailand.
Sometimes placed in monotypic genus *Eurochelidon* on basis of differences from *P. eurystomina* in bill size, eye size and colour and foot size, and of toe proportions, but these considered relatively minor. Monotypic.
Distribution. Breeding range unknown, possibly along rivers in Myanmar, S China, N or C Thailand or Laos; C Thailand in non-breeding season.



Descriptive notes. 15 cm. Plumage is mostly black with green sheen; rump silvery white, wings black; tail black with green gloss, central feathers greatly elongated; underwing-coverts light brown; bill broad, greenish-yellow; eye, including margin of lid, white; feet flesh-coloured. Sexes alike. Juvenile is duller, without elongated tail feathers. Voice. Nothing recorded.
Habitat. Recorded as roosting with other hirundinids in reedbeds. May breed along forested rivers, as *P. eurystomina*.
Food and Feeding. Unknown. One specimen had a large beetle in its stomach. Flight reported as buoyant.
Breeding. Unknown. If breeding on rivers in Thailand, season probably Mar-Apr, when water levels low, but immatures collected late Jan to early Feb suggest earlier breeding. May nest in holes in river sandbars, as *P. eurystomina*, but it has also been suggested, on basis of foot structure and large eyes, that it may not burrow and may be partially crepuscular or nocturnal, and possibly associated with caves.
Movements. Known only as non-breeding visitor in Nov-Feb to Bung Boraphet, in C Thailand.
Status and Conservation. CRITICAL. CITES I. Possibly extinct. First discovered in 1968, near L Bung Boraphet, where over 100 said to have been caught in following few years, but has apparently declined since then. Has not been seen for over 20 years. Twelve collected from roosts and six seen at Bung Boraphet in 1978; there are also rumours of this species being sold in local markets, as well as unconfirmed sightings, but none since 1986. No evidence of the species was found in surveys of rivers in N Thailand in 1969 and N Laos in 1996, nor in searches around Bung Boraphet in 1979-1981 and 1988. Trapping for food and destruction of the roost-site (by burning to clear area for lotus cultivation) have greatly reduced numbers of hirundinids roosting there. Specimens possibly also taken for zoos or other collections. Threats to potential breeding sites may come from the adverse impact on rivers of dams, deforestation and intensification of agriculture, as well as disturbance by fishermen, hunters and sand-dredging. L Bung Boraphet is now designated a Non-hunting Area, although trapping has continued. The priority conservation measure is to locate the breeding areas.
Bibliography. Brooke (1972a), Collar & Andrew (1988), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Dickinson (1986), Inskipp *et al.* (1996), King, B.F. (1997), King, B.F. & Kanwanich (1978), King, W.B. (1978/79), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Ogle (1986), Parkes (1987), Round (1988), Sophasan & Dobias (1984), Stattersfield & Capper (2000), Thonglongya (1968, 1969), Tobias (2003a), Zusi (1978).



PLATE 63

inches 3

cm 8

Subfamily HIRUNDININAE

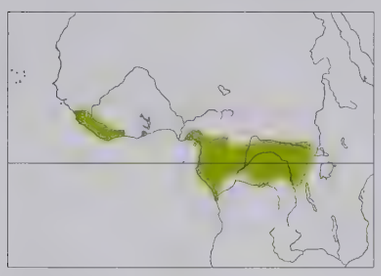
Genus *PSALIDOPROCNE* Cabanis, 1850

3. Square-tailed Saw-wing

Psalidoprocne nitens

French: Hirondelle à queue courte **Spanish**: Golondrina Colicuadrada
German: Grünglanzschwalbe
Other common names: (Square-tailed) Roughwing Swallow

Taxonomy. *Atticora nitens* Cassin, 1857, River Muni, Gabon.
Two subspecies recognized.
Subspecies and Distribution.
P. n. nitens (Cassin, 1857) - S Guinea, Sierra Leone, Liberia, S Ivory Coast, S Ghana, and from SE Nigeria E to N & C DRCongo and S to Gabon, PRCongo and extreme NW Angola (Cabinda).
P. n. centralis Neumann, 1904 - NE DRCongo.



Descriptive notes. 11 cm; 10 g. Plumage is mostly dark brown with green gloss; wings and square-ended tail blackish-brown; chin and throat grey-brown; underwing-coverts blackish-brown with slight gloss. Differs from congeners and from *Petrochelidon fuliginosa* in having square-tipped, not forked, tail. Sexes alike. Juvenile is duller brown. Race *centralis* has blackish-brown throat with green sheen. Voice. Not very vocal; twitters in flocks and has a quiet "sip" call.
Habitat. Lowland primary and secondary forest. Feeds within forest clearings or above canopy; also around villages and cultivated ground.
Food and Feeding. Diet includes beetles (Coleoptera), flies (Diptera), flying ants (Hymenoptera), termites (Isoptera). Forages in pairs or in small flocks of up to 40 individuals, sometimes with *P. obscura* and *Hirundo leucosoma*; both high over forest and low over ground. Flight weak and fluttering.
Breeding. End of dry season and start of rains: Oct-May in Liberia, Jan-Jul in Cameroon, Jul-Mar in Gabon, Aug in Cabinda, and Feb, May and Jul-Oct in DRCongo. Solitary. Digs burrow 0·3-2 m long in vertical bank (including mine shafts and road cuttings), terminal nest-chamber lined with lichens and moss. Clutch 2 eggs (one clutch of 4 possibly result of two females laying in same nest); no information on incubation and fledging periods.
Movements. Sedentary, but some post-breeding movement occurs, e.g. in Liberia and C Ivory Coast.
Status and Conservation. Not globally threatened. Generally localized and uncommon to rare; considered to be common in Liberia, and locally common in Gabon, Ghana and NE DRCongo. Appears to make less use of artificial sites than does *P. pristoptera*. May receive some benefit in short term from forest destruction, because logging roads and newly burnt farmland provide new potential nest-sites, but would suffer loss of habitat in long term. Has decreased in Ivory Coast and Ghana.
Bibliography. Allport *et al.* (1989), Ash & Sharland (1986), Bannerman (1953), Borrow & Demey (2001), Brosset & Érard (1986), Chapin (1953), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (1974, 2000), Dowsett (1989), Dowsett & Dowsett-Lemaire (1991, 1993, 1997), Dowsett & Forbes-Watson (1993), Dutson & Branscombe (1990), Elgood *et al.* (1994), Fishpool & Evans (2001), Gartshore (1989), Gartshore *et al.* (1995), Gatter (1988, 1997), Grimes (1987), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1973), Pedersen (2000), Thiollay (1985).

4. Mountain Saw-wing

Psalidoprocne fuliginosa

French: Hirondelle brune **German**: Kamerunschwalbe **Spanish**: Golondrina Camerunesa
Other common names: Cameroon (Mountain) Saw-wing, Mountain Roughwing (Swallow)

Taxonomy. *Psalidoprocne fuliginosa* Shelley, 1887, Mount Cameroon.
Forms a superspecies with *P. albiceps*. Birds from Bioko described as race *poensis*, but considered indistinguishable. Monotypic.
Distribution. W Cameroon (Mt Cameroon) and Bioko (Fernando Póo).



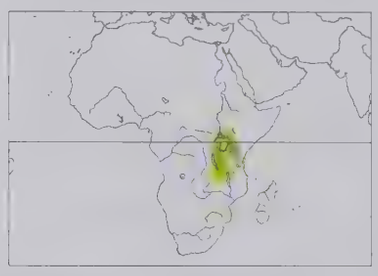
Descriptive notes. 12 cm; 11-14 g. Has dull chocolate-brown plumage, with wings darker brown; tail moderately forked; underwing-coverts smoky brown. Differs from *P. obscura* in having browner and duller plumage, and from *P. pristoptera* (race *petiti*) in darker underwing; distinguished from both by less deeply forked tail. Sexes alike. Juvenile is paler brown. Voice. Quiet, melodious song "dju-dju-diob-djuob-djuob"; calls in flight "see-su", "tchik-tchuk".
Habitat. Forest, forest edge and clearings, montane grassland, plantations, farmland, around human habitations. Present from sea-level up to 3000 m on S & SE slopes, and at 600-2900 m on N slope, of Mt Cameroon; found above 300 m on Bioko.
Food and Feeding. Diet not known. Generally forages in pairs or in small groups, though one flock of over 50 individuals recorded; sometimes with other swallows and swifts (Apodidae). Flight leisurely, with frequent swoops and glides; sometimes pauses before swooping down; will fly low over ground.
Breeding. Oct-Mar. Usually solitary, but group of 10-15 pairs also recorded and 4-5 pairs inspecting a nest-site. Nest a tightly woven pad of lichens and moss, placed on ledge or in hole in cliff, ravine or cave; one group nested in a cave beside a waterfall, and one pair used the brickwork of an outhouse. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Probably resident; some records suggest possible post-breeding movements.
Status and Conservation. Not globally threatened. Restricted-range species: present in Cameroon Mountains EBA. Common, and occurring in a variety of habitats, within its small range. Also recorded on Obudu Plateau and Mambilla Plateau, in E Nigeria, but status there not known.
Bibliography. Amadon (1953), Ash *et al.* (1989), Bannerman (1953), Basilio (1963), Borrow & Demey (2001), Collar & Stuart (1985), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Eisentraut (1956, 1963), Elgood *et al.* (1994), Fishpool & Evans (2001), Keith *et al.* (1992), Louette (1981), Mackworth-Praed & Grant (1973), Mills & Cohen (2004), Pérez del Val (1996), Serle (1965, 1981), Stuart (1986), Wells (1968), Young (1946).

5. White-headed Saw-wing

Psalidoprocne albiceps

French: Hirondelle à tête blanche **Spanish**: Golondrina Cabeciblanca
German: Weißkopfschwalbe
Other common names: White-headed Roughwing

Taxonomy. *Psalidoprocne albiceps* P. L. Sclater, 1864, Uzinza, Tabora District, Tanzania.
Forms a superspecies with *P. fuliginosa*. Two subspecies recognized.
Subspecies and Distribution.
P. a. albiceps P. L. Sclater, 1864 - extreme SE Sudan and E DRCongo, Uganda and W Kenya S to Tanzania (mainly around L Victoria and in W), N Zambia and N Malawi.
P. a. suffusa Ripley, 1960 - N Angola (Lunda Sul).



Descriptive notes. 13 cm; 11-14 g. Male has distinctive white crown, forehead, side of head, chin and throat, black bar from bill through eye and ear-coverts; rest of plumage brownish-black with slight green sheen; tail moderately forked; underwing-coverts grey-brown. Female is similar to male, but with variable amount of white on crown (usually only few white feathers), throat less pure white, tail shorter. Juvenile lacks white on head, has throat ashy brown, tail shorter. Race *suffusa* differs from nominate in having less white on crown, greyer ear-coverts, throat and underwing. Voice. Not very vocal; has twittering call.
Habitat. Savanna, woodland, scrub and forest in upland areas, including miombo woodland and montane, evergreen and riparian forest, to c. 2400 m. Feeds mainly in clearings, at forest edges, and over bush and cultivation.
Food and Feeding. Two stomachs contained flying ants (Hymenoptera); beetles (Coleoptera) and flies (Diptera) also recorded in diet. Feeds in small groups, usually of 2-4 individuals, but occasionally up to 40. Flight slow and fluttery, low over ground or vegetation.
Breeding. Aug-Sept in Sudan, Nov-Mar in Kenya, Apr-Jun in Uganda, Apr-Mar and Nov in Rwanda, May-Oct in DRCongo, Dec-Jan in Zambia and Feb in Malawi; may be double-brooded. Solitary or in small groups. Digs burrow 25-60 cm long in bank, such as road cutting, or may adapt old rodent burrow; terminal chamber with nest made of grass, lichens and feathers. Clutch 2-4 eggs; incubation and fledging periods not documented.
Movements. Migratory in S of range. Breeding birds present in NE Zambia from Oct to early May, and in Malawi during Oct-Apr. Vagrants recorded in Ethiopia, S & C DRCongo, W & S Zambia and Zimbabwe.
Status and Conservation. Not globally threatened. Generally common in much of range; only locally common in DRCongo. Isolated Angolan race *suffusa* uncommon and very local, found only near Cacolo, in SE Lunda Sul.
Bibliography. Aspinwall & Beel (1998), Benson (1951, 1953), Benson & Benson (1977), Benson & Pitman (1957), Benson *et al.* (1971), Britton (1980), Brown & Britton (1980), Byaruhanga *et al.* (2001), Cave & Macdonald (1955), Chapin (1953), Dean (2000), Dowsett (1990), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Friedmann & Williams (1969), Horner (1999), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Nikolaus (1987), Pedersen (2000), Penry (1979), Short *et al.* (1990), van Someren (1916), van Someren & van Someren (1949), Stevenson & Fanshawe (2002), Waiyaki (1998), Zimmerman (1972), Zimmerman *et al.* (1996).

6. Black Saw-wing

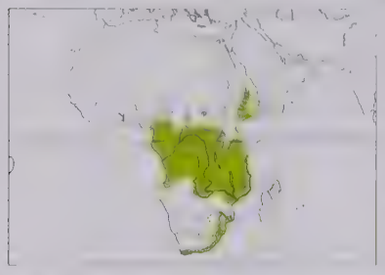
Psalidoprocne pristoptera

French: Hirondelle hérissée **German**: Erzschwalbe **Spanish**: Golondrina Negra
Other common names: Black Roughwing; Blanford's Saw-wing (*blanfordi*); Blue/Fork-tailed Saw-wing (*pristoptera*); Brown Saw-wing/Roughwing (*antinorii*); Congo/Mangbettu Saw-wing (*mangbettorum*); Eastern Saw-wing (*orientalis*); Ethiopian/Kaffa Saw-wing (*oleaginea*); Petit's Saw-wing/Roughwing (*petiti*); Shari/Western Saw-wing (*chalybea*)

Taxonomy. *Hirundo* (*Chelidon*) *pristoptera* Rüppell, 1836, Simen Province, Ethiopia.
Forms a superspecies with *P. obscura*. Taxonomy complex, and some races overlap in range with apparently little interbreeding; hence, races *petiti*, *chalybea*, *blanfordi*, *antinorii*, *oleaginea*, *mangbettorum*, *orientalis* and *holomelas* often treated as full species; further work required in order to assess relationships within the group. Additional proposed races include *kosteri* (Benguela, in W Angola), *percivali* (Malawi, Zimbabwe and Mozambique) and *bamingui* (R Bamingui, in Central African Republic), but these are not clearly distinguishable. Twelve subspecies currently recognized.

On following pages: 7. Fanti Saw-wing (*Psalidoprocne obscura*); 8. Grey-rumped Swallow (*Pseudhirundo griseopyga*); 9. White-backed Swallow (*Cheramoeca leucosterna*); 10. Mascarene Martin (*Phedina borbonica*); 11. Brazza's Martin (*Phedina brazzae*).

Subspecies and Distribution.
P. p. petiti Sharpe & Bouvier, 1876 - E Nigeria, S Cameroon, Gabon and extreme NW Angola (Cabinda).
P. p. chalybea Reichenow, 1892 - N & C Cameroon E to Central African Republic, W Sudan and N & C DRCongo.
P. p. pristoptera (Rüppell, 1836) - W Highlands of N Ethiopia.
P. p. blanfordi Blundell & Lovat, 1899 - Highlands of WC Ethiopia.
P. p. antinorii Salvadori, 1884 - C & S Ethiopia.
P. p. oleaginea Neumann, 1904 - SW Ethiopia and SE Sudan.
P. p. manghettorum Chapin, 1923 - S Sudan S to NE DRCongo.
P. p. ruwenzori Chapin, 1932 - E DRCongo.
P. p. reichenowi Neumann, 1904 - Angola, S DRCongo and Zambia.
P. p. massaica Neumann, 1904 - Kenya and N & C Tanzania.
P. p. orientalis Reichenow, 1889 - S Tanzania and E Zambia S to E Zimbabwe and C Mozambique.
P. p. holomelas (Sundevall, 1850) - S Zimbabwe and S Mozambique S to E & S South Africa.

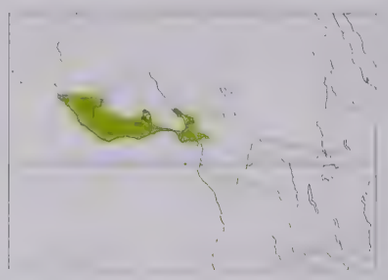


Descriptive notes. 13 cm; 12 g. Dark body and forked tail distinctive. Nominate race is black with purple-blue sheen; wings blackish-brown; tail blackish-brown with green gloss, strongly forked, outer feathers broad; underwing-coverts white. Sexes similar, but female with shorter tail than male. Juvenile is duller, dark brown. Races differ in size, tail shape and tail-fork depth, wing length, colour of sheen and colour of underwing-coverts: *blanfordi* resembles nominate, but with gloss blue-green; *antinorii* has gloss more purple in colour; *oleaginea* has an oily green gloss, with outer rectrices narrower than nominate; *petiti* is brownish-black with slight bronzy gloss, white underwings tinged grey; *chalybea* has oily green gloss, deeply forked tail, grey underwing-coverts; *manghettorum* differs from previous in having underwing-coverts white; *ruwenzori* has dull green gloss and grey-brown underwing-coverts; *holomelas* resembles last, but has longer tail; *massaica* differs from previous in longer wings; *reichenowi* has dull green gloss and greyish-white underwing-coverts; *orientalis* also has dull green gloss, but white underwing-coverts and a more deeply forked tail. Voice. Not very vocal; calls include high-pitched "see-see", described as "chirr-chirr-cheeeu" for *holomelas* and "tseeu-tseeu-tsee-ip" for *orientalis*; also a "chirp" alarm and "hui" during courtship.
Habitat. Savanna, woodland, bush, forest, river valleys, villages and plantations, also montane grassland and moorland. Usually near water. Wide altitudinal range, e.g. *oleaginea* 300-2400 m, but Ethiopian races mainly above 1200 m. Feeds mainly in clearings and forest edges, or over water.
Food and Feeding. Diet includes beetles (Coleoptera), flies (Diptera), and hymenopterans such as ants and ichneumonids. Forages alone, in pairs or in small groups of 6-15 individuals, often low over ground; average height 7 m. Flight weak and fluttering, often changing height, flying up to canopy and then swooping down. Most active at dawn and dusk.
Breeding. Usually in local wet season, i.e. Apr-Jun and Oct-Nov in Cameroon, Apr-Jul in Gabon, Feb-Sept in DRCongo, Feb-Jul in Ethiopia, Jan-Mar and Jun-Dec in Tanzania, Mar in Angola, Jan-Mar in Zambia, Feb-Mar, Aug and Dec in Malawi, Oct-Mar and May in Mozambique, Jul-Apr in Zimbabwe, and mainly Aug-Mar in South Africa; may be double-brooded. Often solitary, but group of ten pairs recorded. Nest-burrow 30-60 cm long, usually c. 45 cm, dug by both sexes, taking up to 3 weeks, in vertical bank, sandy cliff, quarry or road cutting, terminal chamber filled with dry grass and lichen; pre-existing holes also used, and in South Africa (race *holomelas*) recent record of several pairs nesting in drainage pipes of concrete bridge. Clutch 1-3 eggs, usually 2; incubation probably by female alone, at five nests 6-20% of incubation bouts less than 8 minutes, 28-62% more than 15 minutes (up to 50 minutes); incubation period c. 19 days; chicks fed by both sexes, at intervals of mostly 4-20 minutes, nestlings come to burrow entrance to be fed a few days before fledging, fledge at 24-27 days.
Movements. Not well understood. Mainly resident in Gabon, Sudan, Ethiopia and E Africa, making some local post-breeding movements e.g. to lower altitudes. Partial migrant in some areas, e.g. Malawi, Zambia, Mozambique; in South Africa and Zimbabwe breeders present mainly Aug-Apr, perhaps in part migrating to Mozambique, where increased numbers in non-breeding season; some remain all year in S, especially on KwaZulu-Natal coast. Possibly migratory in Angola (although may be resident in Cabinda) and S DRCongo, leaving in dry season. Vagrant in Botswana.
Status and Conservation. Not globally threatened. Generally common to locally abundant, especially in highlands; not common in lower Congo Basin, W Sudan, E African plains, S Zambia and C Zimbabwe. Does not utilize artificial nest-sites to great extent, and may be affected by loss of natural habitat, although does use forestry road cuttings.
Bibliography. Aspinwall (1981b), Bannerman (1953), Belcher (1941), Benson (1980, 1982), Benson & Benson (1977), Benson *et al.* (1971), Bijnens & Upoki (1992), Borrow & Demey (2001), Bowen (1979c, 1980), Britton (1980), Brosset & Érard (1986), Byaruhanga *et al.* (2001), Chapin (1953), Christy & Clarke (1994), Clancey (1964b, 1969b, 1980), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fry (1980), Germain *et al.* (1973), Ginn *et al.* (1989), Hall & Moreau (1970), Hamner (1980, 1989), Harrison *et al.* (1997), Jackson (1973), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Macdonald (1984), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Martin, J. & Broekhuysen (1961), Martin, R. & Pepler (1997b), Moreau (1940a), Nikolaus (1987), Priest (1935), Rawdon (2002), Saunders (1981), Serle (1950b, 1965), Short & Horne (1985), Short *et al.* (1990), Sinclair & Hockey (1996), Skead (1964), van Someren (1956), Stevenson & Fanshawe (2002), Tarboton (2001), Urban & Brown (1971), Waugh (1978), White (1961b), Zimmerman (1972), Zimmerman *et al.* (1996).

7. Fanti Saw-wing
Psalidoprocne obscura

French: Hirondelle fanti **German**: Scherenschwanzschwalbe **Spanish**: Golondrina Fanti
Other common names: Fanti/Fantee Roughwing

Taxonomy. *Hirundo obscura* Hartlaub, 1855, Dabocrom, Ghana.
Forms a superspecies with *P. pristoptera*. Monotypic.
Distribution. S Senegambia E to C & S Nigeria and W Cameroon.
Descriptive notes. 17 cm; 9-10 g. Has glossy dark green plumage; wings and tail black with green gloss, tail long and strongly forked; underwing-coverts dull brown. Distinguished from *P. pristoptera* by longer tail, dark glossy green plumage and brown underwing-coverts. Sexes similar, female



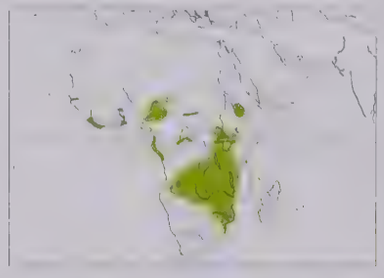
with shorter tail than male. Juvenile is duller brown, with shorter tail. Voice. Not very vocal; call is a quiet "seep".
Habitat. Woodland, forest edge, grassland and rivers; usually near water. Feeds in clearings or forest edge and over grassland.
Food and Feeding. Diet includes beetles (Coleoptera). Forages in pairs or small groups, sometimes up to 50 together, often low over grassland or water, or around trees. Flight slow and buoyant. Also hawks insects from perch in tree.
Breeding. In rainy season, generally May-Aug; Sept-Oct in Sierra Leone and May-Oct in Nigeria. Solitary or in small groups. Both sexes dig burrow c. 60 cm long in riverbank or other vertical bank, road cutting or mine shaft, nest-chamber lined with plant fibres and moss. Clutch 2 eggs; incubation and fledging periods not documented.
Movements. Resident in some areas, e.g. S Nigeria, but breeding visitor farther N. Generally more common in dry season in S of range, and in wet season in N; commonest in Gambia in Jul-Nov; in Ivory Coast, most common Oct-May in S and Apr-Sept in N; in Ghana, most numerous Sept-Mar in S and Jun-Sept in N. Vagrants recorded in SW Niger, SE Burkina Faso and Central African Republic.
Status and Conservation. Not globally threatened. Uncommon to locally common; locally common in, for example, Sierra Leone, Ivory Coast and Nigeria. Rare to not uncommon in Liberia.
Bibliography. Bannerman (1953), Bates (1930), Borrow & Demey (2001), Cheke & Walsh (1996), Colston & Curry-Lindahl (1986), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood, Fry & Dowsett (1973), Elgood, Heigham *et al.* (1994), Field (1974), Fishpool & Evans (2001), Fry (1980), Gatter (1988, 1997), Gore (1990), Grimes (1987), Jensen & Kirkeby (1980), Keith *et al.* (1992), Louette (1981), Mackworth-Praed & Grant (1973), Marchant (1942), Morel & Morel (1990), Serle (1949), Thiollay (1985), Wilkinson & Beecroft (1988).

Genus *PSEUDHIRUNDO* Roberts, 1922

8. Grey-rumped Swallow
Pseudhirundo griseopyga

French: Hirondelle à croupion gris **German**: Graubürzelschwalbe **Spanish**: Golondrina Culigrís
Other common names: Andrew's/Kenya Swallow ("*andrewi*")

Taxonomy. *Hirundo griseopyga* Sundevall, 1850, Natal, South Africa.
Once included in genus *Hirundo* because of its coloration, but DNA data indicate close relationship to other members of the "core martin group". Proposed races *liberiae* (from Liberia) and *gertrudis* (from NE Nigeria and N Cameroon) undiagnosable. "*Hirundo andrewi*", based on single specimen caught at L Naivasha, Kenya, in 1965, has been treated as a race of present species but now generally thought to be an aberrant, darker individual (grey-brown below, darker chest side) of nominate race, probably on migration from unknown breeding area (possibly Ethiopia). Two subspecies normally recognized.
Subspecies and Distribution.
P. g. melbina (J. Verreaux & E. Verreaux, 1851) - Gambia, E Sierra Leone, Liberia, SW Ivory Coast, Ghana, and coast from Equatorial Guinea S to extreme NW Angola (Cabinda).
P. g. griseopyga (Sundevall, 1850) - E Nigeria, N Cameroon, N Central African Republic, extreme S & E Sudan, Ethiopia, E PRCongo, and from W & E DRCongo, Uganda and W Kenya S to Angola, extreme N Namibia, N Botswana, NE South Africa (S to KwaZulu-Natal) and N & E Swaziland.



Descriptive notes. 14 cm; 8-12 g. Crown and ear-coverts to hindneck are dark brown; back and wings glossy dark blue, rump and upper-tail-coverts grey-brown; tail strongly forked, dark brown with blue gloss; underparts all white, pinkish wash from chin to breast in fresh plumage. Distinguished from other hirundinids by combination of deeply forked tail without white spots and grey rump. Sexes alike. Juvenile is browner with pale feather fringes above, abdomen and flanks grey, rest of underparts white with buff-pink wash, greyer near breast and side of neck, tail shorter. Race *melbina* has darker brown rump than nominate. Voice. Not very vocal; song is a weak twittering; also a grating "chraa" in flight.
Habitat. Open areas such as floodplains, grassland, savanna or open woodland, often near water. In both lowland and upland areas, to c. 2200 m in E Africa and 2300 m in Malawi. Often feeds over burnt and cleared ground; roosts in reeds, also recorded as roosting on bare ground.
Food and Feeding. Diet includes beetles (Coleoptera) and flies (Diptera). Forages mainly low over water, also over open ground and around tree canopies, at average height of 8 m, often with other hirundines. Flight weak and erratic. Sometimes lands to eat insect caught in flight. Follows tractors to feed on flushed insects.
Breeding. Mainly in dry season, also sometimes breeding opportunistically to take advantage of good conditions: Nov-May in W Africa, Mar-Apr and Dec in Ethiopia, May, Jul-Oct and Mar (peak Aug-Sept) in E Africa, Aug-Sept in Angola, Jul-Sept in Zambia and Mozambique, Jul-Nov (peak Jul-Aug) in Zimbabwe, and May-Dec (peak Jun-Aug) in South Africa. Solitary or in small groups of 3-10 pairs; sometimes near *Riparia congica* in DRCongo. Digs burrow up to c. 1 m long at steep angle into ground in open situation, e.g. sandbar, dune, ploughed field, golf course, various kinds of sports field, or airfield, also recorded in grass-covered, gently sloping riverbank; rodent holes, old kingfisher (Alcedinidae) or bee-eater (*Merops*) burrows and holes in termite (Isoptera) mounds also used; nest-chamber lined with grass. Clutch 1-5 eggs (2-3 near equator); incubation and fledging periods not documented. Nests often flooded if rain falls.
Movements. Not well understood. Forms large non-breeding flocks, usually up to c. 200 individuals, sometimes to 3000; often moves away from breeding sites in rainy season. Resident on

R Congo and in Ethiopia. Movements not clear in W & C Africa, but local shifts in some areas; occurs Nov-Feb in Gambia, and is a partial migrant in Liberia; sporadic in Nigeria. Numbers vary seasonally in E Africa. Usually present Apr-Oct in Zimbabwe, but resident in dry years. Recorded mainly Apr-Oct in Botswana, Apr-Sept in E South Africa and Mar-Sept in Zambia; those populations possibly spend non-breeding season in Mozambique. Several records outside main range, e.g. Mali, N Ivory Coast, Burkina Faso, Benin, N DRCongo; even three in S Atlantic off Angola.

Status and Conservation. Not globally threatened. Scarce to uncommon in some areas, locally common or abundant in others. Generally scarce in W Africa, but locally not uncommon in Liberia; rare in Sudan, locally abundant in Ethiopia; uncommon in E Africa; common on R Congo and in DRCongo, Zambia and Malawi; locally common in Botswana (in N), Zimbabwe (Mashonaland Plateau) and E South Africa; formerly bred along coast of KwaZulu-Natal but now confined to NE. Fairly adaptable; does not use artificial nests, but sometimes nests on fields and other sites associated with human settlements.

Bibliography. Aspinwall (1980a), Bannerman (1953), Benson (1951, 1980), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Brooke (1984a), Byaruhanga *et al.* (2001), Clancey (1964b), Colston & Curry-Lindahl (1986), Dean (2000), Dowsett (1972a), Dowsett & Dowsett-Lemaire (1991, 1993), Dowsett & Forbes-Watson (1993), Earlé (1987b), Elgood, Fry & Dowsett (1973), Elgood, Heigham *et al.* (1994), Fry (1973), Gatter (1997), Gore (1990), Grimes (1987), Harrison *et al.* (1997), Irwin (1981), Jourdain & Shuel (1935), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lowe (1938), Macdonald (1984), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Penry (1994), Schmidl (1982), Serle (1957), Short *et al.* (1990), Sinclair & Hockey (1996), Stevenson & Fanshawe (2002), Tarboton (2001), Taylor (1979a), Tree (1976), Urban & Brown (1971), Waugh (1978), Winterbottom (1939), Zimmerman *et al.* (1996).

Genus *CHERAMOECA* Cabanis, 1850

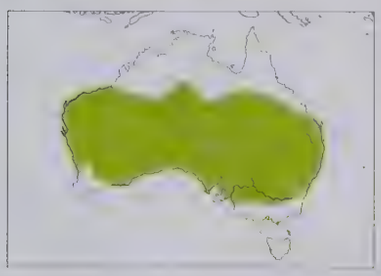
9. White-backed Swallow

Cheramoeca leucosterna

French: Hirondelle à dos blanc **Spanish**: Golondrina Dorsiblanca
German: Weißrückenschwalbe
Other common names: Black-and-white/White-breasted Swallow

Taxonomy. *Hirundo leucosternus* [*sic*] Gould, 1841, Naomi River, New South Wales, Australia. Closely related to *Pseudhirundo*. Proposed races *marngli* from R Fitzroy (N Western Australia) and *stonei* from Warialda (New South Wales) undiagnosable. Species name often erroneously spelled *leucosternum* or *leucosternus*, but, being latinized Greek adjective, must agree with feminine genus. Monotypic.

Distribution. W, C, S & E Australia.



Descriptive notes. 15 cm; 12-16 g. Pied coloration distinctive. Has forehead, outer crown, mantle, chin, throat, upper breast and underwing-coverts white; centre of crown and band across face and hindneck grey-brown, rest of upperparts and lower breast, abdomen and undertail-coverts black with slight blue gloss; wings and tail brownish-black, tail strongly forked. Sexes alike. Juvenile is duller and browner, white parts buffy, tail shorter. Voice. Song is a twittering; also a harsh "check" uttered in flight.

Habitat. Open country, usually near water, such as rivers with sandy banks.

Food and Feeding. Diet includes beetles (Coleoptera), mirid bugs (Hemiptera), nematoceran flies, Lepidoptera, hymenopterans (including ants and parasitic wasps) and spiders (Araneae). Feeds alone or in small groups, often high up; mixes with other swallows. Flight fluttery and erratic.

Breeding. Jul/Aug-Dec, after rains in arid regions; single-brooded. Solitary, or in groups of up to 80 pairs. Excavates own burrow in sandy cliff, riverbank, mine or quarry, but also uses burrow of other species e.g. bandicoot (Peramelidae) or rat kangaroo (Potoroinae), burrow c. 60 cm long, enlarged end chamber with nest made of dry grass and leaves. Clutch 4 or 5 eggs, occasionally 6; no information on incubation and fledging periods.

Movements. Generally resident; some post-breeding movements, e.g. deserts breeding sites in S Murray-Darling region. Occasional non-breeding visitor to N Western Australia (Kimberley and Rolling Downs regions). Forms small flocks after breeding.

Status and Conservation. Not globally threatened. Generally common, depending on presence of breeding sites. Has extended its range over the last century to coast of SE Queensland and New South Wales, W along the S coast, and S of R Swan. Uses artificial sites to only limited extent, but mining and quarrying operations have provided some nest-sites and this species probably benefits from land clearance.

Bibliography. Blakers *et al.* (1984), Campbell (1901), Congreve (1972), David & Gosselin (2002a), Edwards (1948), Lord (1956), Macdonald (1988), Morcombe (2000), Pizzey & Knight (1997), Saunders & Ingram (1995), Schodde & Mason (1999), Serventy (1970), Serventy & Whittell (1962), Simpson & Day (1998), Slater *et al.* (1989), Trounson & Trounson (1987), Waterman & Llewellyn (1968).

Genus *PHEDINA* Bonaparte, 1857

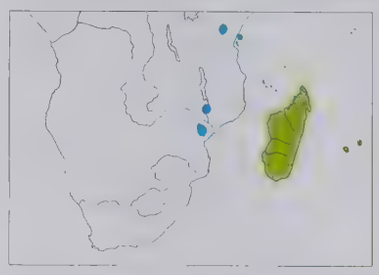
10. Mascarene Martin

Phedina borbonica

French: Hirondelle des Mascareignes **Spanish**: Golondrina de las Mascareñas
German: Maskarenenschwalbe
Other common names: Madagascar Martin

Taxonomy. *Hirundo borbonica* J. F. Gmelin, 1789, Bourbon = Mauritius.
Forms a superspecies with *P. brazzae*. Two subspecies recognized.

Subspecies and Distribution.
P. b. madagascariensis Hartlaub, 1860 - breeds Madagascar, possibly also Pemba I (off E Tanzania); migrates to E Africa.
P. b. borbonica (J. F. Gmelin, 1789) - Mauritius and Reunion I.



Descriptive notes. 15 cm; 18-24 g. Nominate race has crown and upperparts grey-brown with fine dark streaks; wings and tail dark brown, tail with shallow fork, tertials with pale edges when plumage fresh; underparts grey-brown, white on throat and abdomen, all with prominent streaks (broader than on upperparts); underwing-coverts grey-brown. Distinguished from *Riparia* species by streaked underparts. Sexes alike. Juvenile differs from adult in having broad white tips of secondaries. Race *madagascariensis* paler, with white undertail-coverts, and more pronounced streaking on breast. Voice. Song is a warbling "siri-liri siri-liri"; calls include a "chip" contact call; and copulatory and aggressive calls.

Habitat. Open and semi-open country. On Mauritius and Reunion, feeds over reservoirs, woodland and thickets, and along cliffs and the shore; to 1500 m on Mauritius, mainly at 200-500 m on Reunion. In Madagascar, over open ground, bush, woodland, forest, marshes and rice fields, from sea-level to 2400 m. In non-breeding season, also forages in areas of recently cleared forest and over canopy of *Brachystegia* woodland in Mozambique.

Food and Feeding. Diet includes beetles (Coleoptera) and Hymenoptera. Forages singly or in small groups with other swallows and swifts (Apodidae), close to ground and trees; flight slow and fluttering. Most active before dusk.

Breeding. Aug-Nov in Madagascar, Sept-Dec on Mauritius and Reunion. In groups of c. 3-20 pairs. Nest an open cup of twigs and other plant material such as dry grass, lined with finer material and feathers, placed in crevice or on ledge in rocks, in grass tuft, on roof, or in building, subterranean passage or cave, often 3-5 m above water. Clutch 2 eggs in Madagascar and on Mauritius, 2-3 on Reunion; incubation by female, period undocumented; both sexes feed brood, fledging period not known.

Movements. Resident with post-breeding dispersal on Mauritius and Reunion (nominate race); absent from breeding sites early Jan to mid-Aug. Race *madagascariensis* makes both local and long-distance movements after breeding; recorded in non-breeding season (mainly Jun-Aug) at widely scattered sites in E Africa, e.g. Kenya, Pemba I (off Tanzania), Malawi, C Mozambique (also one recent record S of R Save). Passage migrants recorded on Aldabra, Seychelles and other islands; vagrant on Amirante Is.

Status and Conservation. Not globally threatened. Common but somewhat local in Madagascar; no recent data on population size, but in mid-20th century large numbers ("hundreds") recorded in non-breeding season in Africa, e.g. in Malawi in Jun-Jul 1944 and Apr 1959 and in Mozambique in Jun-Jul 1968; much rarer in Africa in recent years. Status on Pemba I uncertain, recorded in non-breeding season but present also during breeding season. Nominate race fairly common, in 1973-1974 at least 70-75 pairs on Mauritius and possibly 200-400 pairs on Reunion; this race has been badly affected by cyclones, especially in 1861, after which few birds seen for several years, and to lesser extent in 1980.

Bibliography. Barré (1988), Barré & Barau (1982), Barré *et al.* (1996), Benson (1944), Berlioz (1946), Cheke (1987a, 1987b), Clancey *et al.* (1969), Cohen *et al.* (1997), Dee (1986), Delacour (1932), Diamond (1987), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Feare (1977), Horne (1987), Keith *et al.* (1992), Langrand (1995), Lewis & Pomeroy (1989), Maclean (1993a), Medland (1988), Milon *et al.* (1973), Morris & Hawkins (1998), Pakenham (1979), Rand (1936), Sheldon & Winkler (1993), Sinclair & Langrand (1998), Spottiswoode & Ryan (2002), Staub (1973), Yamagishi *et al.* (1997), Zimmerman (1978b), Zimmerman *et al.* (1996).

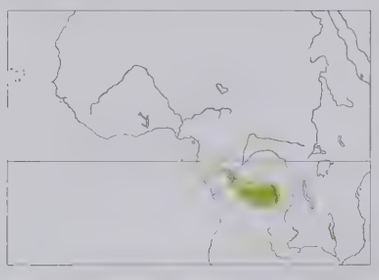
11. Brazza's Martin

Phedina brazzae

French: Hirondelle de Brazza **German**: Brazzaschwalbe **Spanish**: Golondrina del Congo
Other common names: Congo Martin, Brazza's Swallow

Taxonomy. *Phedina Brazzae* Oustalet, 1886, below Kwamouth, lower River Congo, DRCongo. Sometimes placed in a monotypic genus *Phedinopsis* and occasionally in *Riparia*. Is, however, close to *P. borbonica*, with which it forms a superspecies. Monotypic.

Distribution. S PRCongo, S DRCongo and NE Angola (N Lunda Norte).



Descriptive notes. 12 cm; 13 g. Plumage is dark brown above, darkest on head, with indistinct dark streaks from mantle to uppertail-coverts; wings and tail dark brown, tail square-ended; underparts white with thick dark streaks, breast sometimes with grey-brown wash; underwing-coverts dark brown. Differs from *Riparia* species in having striped underparts. Sexes alike. Juvenile has pale edges and rufous tips of upperpart feathers, greyish chin and throat, more diffuse stripes below. Voice. Unknown.

Habitat. Forested rivers.

Food and Feeding. Diet includes termites (Isoptera). Forages in flocks over rivers, sometimes with *Cecropis abyssinica*; flight slow and heavy.

Breeding. End of dry season, Jul-Oct. Small, loose groups. Nest in burrow c. 50 cm long in riverbank or ditch, nest-chamber lined with dry grass and feathers. One clutch of 3 eggs recorded; incubation and fledging periods not documented. Late nests may be subject to flooding.

Movements. No information; recorded E of 20° E only when breeding.

Status and Conservation. Not globally threatened. Data-deficient. Uncommon and local, with limited range. Probably subject to human predation.

Bibliography. Borrow & Demey (2001), Chapin (1953), Dean (2000), Dowsett (1989), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Lippens & Wille (1976), Lynes (1938), Mackworth-Praed & Grant (1973), Pedersen (2000), Rand *et al.* (1959), Sinclair & Ryan (2003), Stattersfield & Capper (2000).



PLATE 64

inches 3

cm 8

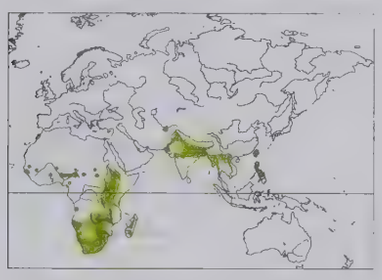
Genus *RIPARIA* T. Forster, 1817

12. Plain Martin

Riparia paludicola

French: Hirondelle paludicole **Spanish**: Avión Paludícola
German: Braunkehl-Uferschwalbe
Other common names: African/Brown-throated/Grey-breasted Sand Martin, Plain Sand Martin; Indian Sand Martin (*chinensis*)

Taxonomy. *Hirundo paludicola* Vieillot, 1817, South Africa.
Forms a superspecies with *R. congica*, *R. riparia* and *R. diluta*. Race *tantilla* sometimes included in *chinensis*. Name *paludibula* has priority over *minor*, but former has not been in use since at least 1894, and latter thus retained by virtually all recent authors. Nine subspecies recognized.
Subspecies and Distribution.
R. p. mauritanica (Meade-Waldo, 1901) - W Morocco.
R. p. minor (Cabanis, 1850) - locally from Senegambia E to Sudan and N Ethiopia.
R. p. schoensis Reichenow, 1920 - Ethiopian Highlands.
R. p. newtoni Bannerman, 1937 - SE Nigeria and adjacent W Cameroon.
R. p. ducis Reichenow, 1908 - E DRCongo, Uganda and W & C Kenya S to Burundi and N & C Tanzania.
R. p. paludicola (Vieillot, 1817) - W & SW Angola, Zambia, S Tanzania and Malawi S to South Africa.
R. p. cowani (Sharpe, 1882) - E Madagascar.
R. p. chinensis (J. E. Gray, 1830) - S Tadjikistan, N Afghanistan, Pakistan and N India E to Myanmar, S China (S Yunnan) and Indochina, also Taiwan.
R. p. tantilla Riley, 1935 - N Philippines (Luzon).



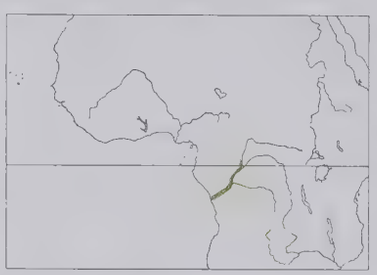
Descriptive notes. 12 cm; 9·5-17 g. Nominate race is somewhat variable in overall coloration, but typically olive-brown above, with wings and tail dark brown; chin, throat and breast grey-brown, abdomen and undertail-coverts dull white; underwing-coverts grey-brown; tail square-ended. Distinguished from *R. riparia* and *R. diluta* by brown throat, no breastband, no feathers on tarsus, from *Ptyonoprogne* species by small size and lack of white in tail, and from *Phedina* martins by unstreaked belly. Sexes alike. Juvenile has buffy feather edges. Races separated by size and by shade of brown, but differences slight, and much individual variation: *mauritanica* is small and pale; *minor* is small, with dark upperparts; *schoensis* is larger and dark; *newtoni* is also dark, with greyer throat and breast and extensive white on abdomen; *ducis* is dark, with blackish crown and little white on abdomen; *cowani* is small, with greyer underparts and grey-white throat; *chinensis* is small, with pale grey-brown upperparts and throat; *tantilla* is similar to last, but has darker rump. Voice. Weak twittering song; calls include a contact call "svee-svee", a flock call "skrrr", a low "chee, wer-chi-cho wer-chi-cho" between mates during nest-burrowing, a "chi-choo" on arrival at nest with young, and a harsh alarm call.
Habitat. Near rivers, lakes and other waterbodies, especially in breeding season. Also forages over grassland, bush, sand dunes, sewage works, reedbeds, wetlands, rice fields, and estuaries. Wide altitudinal range: from sea-level mainly to 3000 m in E Africa, but to 3700 m in E DRCongo (Mt Karisimbi); 500-1800 m in Madagascar; mainly to 1000 m in China and 1500 m in Indian Subcontinent, but locally to 4600 m. Non-breeding flocks roost in reedbeds.
Food and Feeding. Diet includes dipteran flies such as chironomids, tipulids, syrphids and muscids, Hymenoptera (ants), homopteran bugs (aphids), beetles (Coleoptera), dragonflies (Odonata) up to 25 mm long; grasshopper (Orthoptera) also recorded. Feeds in flocks, often of c. 20 individuals, sometimes hundreds, often with other hirundines, e.g. *R. riparia*; usually over water at average height of 14 m, but also close to water's surface. Flight weak and fluttering. Often feeds late in evening. Visits grass fires in S Asia.
Breeding. Season variable, probably depending on rains, generally in dry season in S Africa, in rains in E Africa; Oct and Dec-Mar in Morocco, Oct-Feb in Nigeria, almost any month in Ethiopia, mainly Mar-Jul in E Africa, Jun-Sept in Zambia and Zimbabwe, Jun-Jul in Malawi, Nov-Dec in Mozambique; breeds most months in South Africa (mainly Feb-Oct in Free State, KwaZulu-Natal and in E, and peaks Sept-Dec in SW Cape and Nov-Jan in E Cape); Nov-Apr in Madagascar; mainly Oct-Feb, rarely to May, in Indian Subcontinent, but Feb-Nov in Nepal; Jun-Aug in Tadjikistan; Mar-May in Philippines. Usually in small groups of c. 3-12 pairs, once 137, and up to 500 pairs reported, burrows close together; occasionally solitary; sometimes breeds with *R. riparia*. Copulation on the ground recorded. Burrow dug by both sexes, taking turns, completed in c. 3 weeks, usually 30-80 cm long, sometimes over 150 cm, 0·8-3 m above ground in bank of e.g. river, lake, road, quarry, pit, gorge or mine dump; old hole of starling (Sturnidae) or bee-eater (*Merops*) sometimes used, and one nest recorded in drainage pipe; enlarged nest-chamber lined with grass, hair and feathers. Clutch 2-4 eggs, but 3-5 in Madagascar and up to 5 or 6 in India; incubation by both sexes, mainly by female, period c. 12 days; both also feed chicks, which leave nest at c. 20-25 days; fledglings remain with parents for some days. Recorded longevity in wild c. 5 years.
Movements. Sedentary in some areas, e.g. Morocco; partial migrant in others, e.g. E & S Africa. Forms large flocks after breeding. In Zimbabwe, Jun-Sept breeding population replaced by migrants in austral winter. Post-breeding dispersal, especially from flooded sites, rather than regular migration, is usual, e.g. in Sudan moves S after breeding; makes local movements in Pakistan, India and Bangladesh; where present all year, numbers often fall in non-breeding season. Migratory in SC Asia (S Tadjikistan), absent Sept-May. Vagrant in several countries, e.g. Egypt, Israel, Saudi Arabia, Oman.
Status and Conservation. Not globally threatened. Common in most of range. In Africa, common in some areas, as in Morocco, where range has recently increased near Rabat, and in S Africa, especially SW Cape; often locally abundant when suitable breeding sites present, e.g. in Ethiopia and E Africa. Generally common and widespread in Asia. Probably benefits from using some artificial nest-sites, but adversely affected by wetland drainage, dam construction and regulation of river flows.
Bibliography. Ali & Ripley (1987), Bannerman (1953), Belcher (1941), Benson & Benson (1977), Benson, Brooke *et al.* (1971), Benson, Colebrook-Robjent & Williams (1976-1977), Borrow & Demey (2001), Broekhuysen & Stanford (1954), Brooke (1975), Byaruhanga *et al.* (2001), Chapin (1953), Clancey (1964b), Cramp (1988), Dean (2000), Dementiev *et al.* (1968), Dickinson *et al.* (1991), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Duckworth *et al.* (1999), Elgood, Fry & Dowsett (1973), Elgood, Heigham *et al.* (1994), Étchécopar & Hüe (1964, 1983a, 1983b), Ginn *et al.* (1989), Grimmett *et al.* (1998), Harrison *et al.* (1997), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Irwin (1981), Keith *et al.* (1992), Langrand (1995), Lekagul & Round (1991), Lewis & Pomeroy (1989), MacKinnon & Phillipps (2000), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Martin & Pepler (2001), McClure (1998), Milon *et al.* (1973), Nikolaus (1987), Oo-u-kijo (1936), Penry (1994), Pierce (1998), Pinto & Lamm (1958), Rand (1936), Ripley (1982), Roberts (1992), Robson (2000), Salewski (1998), Serle (1943), Shirihai (1996), Short *et al.* (1990), Sinclair & Hockey (1996), Smythies (1986), Snow & Perrins (1998), van Someren (1956), Stepanyan (1995), Tarboton (2001), Taylor (1942), Thévenot *et al.* (2003), Tree (2002), Tree & Earlé (1984), Urban & Brown (1971), Vaurie (1959), Waugh (1978), Zimmerman *et al.* (1996).

13. Congo Sand Martin

Riparia congica

French: Hirondelle du Congo **German**: Kongouferschwalbe **Spanish**: Avión del Congo
Other common names: Congo Martin

Taxonomy. *Cotile congica* Reichenow, 1887, Manyanga, lower River Congo, DRCongo.
May be derived from *R. riparia*. Forms a superspecies with that and with *R. paludicola* and *R. diluta*. Monotypic.
Distribution. R Congo and lower R Ubangi, on PRCongo-DRCongo border.



Descriptive notes. 11 cm. Has grey-brown head and upperparts, dark brown wings and tail, tail almost square; upper breast light brown, rest of underparts white; underwing-coverts dark brown. Differs from *R. riparia* in smaller size, less well-defined breastband; from *R. paludicola* in paler throat. Sexes alike. Juvenile has pale feather tips on upperparts, less distinct brown breastband. Voice. Unknown.
Habitat. Riverine, but also feeds over forest.
Food and Feeding. Details of diet not known. Flight fast and fluttery, with rapid shallow wingbeats. Will feed with other swallows, especially *R. riparia*.
Breeding. When river level low, exposing sand; breeds in Feb-Mar near Lukolela. Colonial; sometimes nests near *Pseudhirundo griseopyga*. Digs own burrow in sandbar or steep side of sandy island. Clutch size and incubation and fledging periods not recorded.
Movements. Probably resident, although some individuals caught near Mbandaka, in DRCongo, thought to be migrants.
Status and Conservation. Not globally threatened. Locally common to abundant within its limited range, but few seen along R Ubangi. Recorded also along R Sangha, in PRCongo, but status there uncertain.
Bibliography. Bannerman (1953), Borrow & Demey (2001), Chapin (1953), Demey *et al.* (2000), Dowsett (1989), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1992), Lynes (1938), Mackworth-Praed & Grant (1973), Pedersen (2000), Sinclair & Ryan (2003).

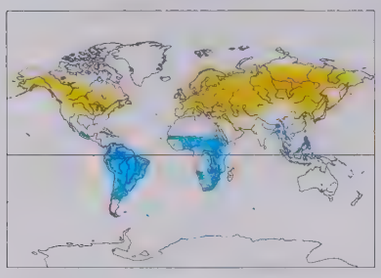
14. Collared Sand Martin

Riparia riparia

French: Hirondelle de rivage **German**: Uferschwalbe **Spanish**: Avión Zapador
Other common names: Common/European/Gorgeted Sand Martin; Bank Swallow (America)

Taxonomy. *Hirundo riparia* Linnaeus, 1758, Europe = Sweden.
Forms a superspecies with *R. paludicola*, *R. congica* and *R. diluta*. Until recently considered conspecific with last, but the two differ in plumage and voice, and occur in separate breeding colonies in wide area of sympatry (full extent of which not yet clear). Described race *kolymensis* (E Siberia) merged with nominate and *taczanowskii* (L Baikal area and C Mongolia E to Ussuriland) with *ijimae*, but both possibly distinguishable; proposed taxon *dolgushini* (from SE Kazakhstan) is synonym of *innominata*. North American populations sometimes considered to represent a separate, supposedly smaller, race *maximiliani*, but differences from Eurasian birds negligible. Five subspecies recognized.
Subspecies and Distribution.
R. r. riparia (Linnaeus, 1758) - North America from W & C Alaska and Canada (N Yukon, NW & SC Mackenzie and N Saskatchewan E to S Labrador and SW Newfoundland) S in USA to C California, W Nevada, Utah, N & C New Mexico, NE Oklahoma, N Alabama, C West Virginia, E Virginia, and casually NW N Carolina and SC South Carolina, also SC Texas and NE Mexico (N Nuevo Léon, N Tamaulipas); Eurasia from Ireland, Britain and N Scandinavia E through Siberia (E to about R Kolyma and Kamchatka), S to N Mediterranean, Turkey, Syria, Iraq, SW Iran and C Asia; has bred locally in NW Africa. Winters South America and Africa.
R. r. innominata Zarudny, 1916 - SE Kazakhstan; may winter in Africa or in SW or S Asia.
R. r. ijimae (Lönnberg, 1908) - L Baikal area and C Mongolia E to Sakhalin, N Japan (Hokkaido) and Kuril Is; reported as breeding also in NE India (Assam), but review required. Winters SE Asia, including Philippines.
R. r. shelleyi (Sharpe, 1885) - Egypt (Nile Valley); winters S to Sudan and Eritrea.
R. r. eilata Shirihai & Colston, 1992 - breeding range not known; recorded on passage in Israel.
Descriptive notes. 12 cm; 11·19·5 g. Combination of small size, white chin and throat and well-demarcated dark breastband distinctive. Nominate race is earth-brown or grey-brown above,

On following pages: 15. Pale Sand Martin (*Riparia diluta*); 16. Banded Martin (*Riparia cincta*); 17. Tree Swallow (*Tachycineta bicolor*); 18. Violet-green Swallow (*Tachycineta thalassina*); 19. Golden Swallow (*Tachycineta euchrysea*); 20. Bahama Swallow (*Tachycineta cyaneoviridis*); 21. Tumbes Swallow (*Tachycineta stolzmanni*); 22. Mangrove Swallow (*Tachycineta albilinea*); 23. White-winged Swallow (*Tachycineta albiventer*); 24. White-rumped Swallow (*Tachycineta leucorrhoa*); 25. Chilean Swallow (*Tachycineta meyeni*).



upperparts with pale feather tips in fresh plumage; remiges and rectrices darker brown with faint green sheen, tail shallowly forked; underparts white, with broad brown breastband (can extend down centre of belly); underwing-coverts dark brown; tuft of feathers on hind toe at joint with base of tarsus. Distinguished from similar *R. diluta* by darker and less grey upperparts, more distinct breastband; from *R. cincta* by smaller size, lack of white supercilium. Sexes alike. Juvenile has pale feather edges on upperparts, cinnamon to rufous-buff wash on lores, cheeks, neck side and chin to breast, and buff or cream tinge on lower underparts. Race *innominata* is smaller, paler and greyer than nominate, with less clearcut breastband; *ijimae* is darker brown; *shelleyi* is smaller and paler, with narrow breastband; *eilata* is small, with buff-brown chin, brown mottling on throat. Voice. Song is a harsh twittering; calls include a harsh contact call "tschr", high- and low-pitched alarm calls, an excitement call "schrrp", and calls uttered to young.

Habitat. Mainly lowland, open country, especially near water, breeding along coasts, rivers and streams, and at lakes and reservoirs, sometimes close to or within areas of human habitation. Breeding habitat ephemeral; suitability of sites depends on erosion, which both creates new sites and destroys established ones. Also, prefers new, fresh banks without old burrows. Forages over waterbodies, grassland, farmland, occasionally woodland. Often roosts in reedbeds.

Food and Feeding. Mostly insects, some spiders. Diet varies within and between years and sites, depending on local availability of insects. In North American study, diet consisted of 33% Hymenoptera, 27% flies (Diptera), 18% beetles (Coleoptera), 10% mayflies (Ephemeroptera), 8% hemipteran bugs, 2% Odonata and 1% Lepidoptera; in Scotland, 69% Diptera, 13% hemipterans and psocids (Psocoptera), 11% Coleoptera, 5% Hymenoptera. For adults in North America, 28% hemipterans, 21% Coleoptera, 20% Diptera, 17% Hymenoptera, 4% spiders (Araneae) and 1% stoneflies (Plecoptera); for nestlings, 34% Hemiptera, 20% Diptera, 18% Coleoptera and 17% Hymenoptera. Nestlings in Scotland fed 37% Diptera (mainly Nematocera), 33% Ephemeroptera, 26% Hemiptera and Psocoptera (mainly aphids), and a few Coleoptera, Hymenoptera, lacewings (Neuroptera), caddis flies (Trichoptera), Lepidoptera and spiders. Forages alone or in small or large groups, on average 15 m above ground, but in adverse weather usually low over water. Mixes freely with other hirundines. Flight fast and fluttery, with shallow and rapid wingbeats. Sometimes follows tractors, and occasionally takes insects from ground or water, especially when these form large concentrations; recorded as taking maggots dropped on ground by anglers. When breeding, forages mostly close to nest; in Scotland, fed up to 1 km from colony, with average distance 190 m.

Breeding. Mainly late Apr to Aug; two broods in most of range, but one in far N & E, and one appears to be usual in North America. Socially monogamous, but extra-pair paternity occurs (in Scottish study 36% of 45 broods, 14% of nestlings; in Hungarian study 40% of 22 broods, 24% of nestlings); also, male's extra-pair mate will lay in his nest (in Scottish study 9% of broods, 2·4% of nestlings), but no evidence of this in Hungarian study; occasionally changes mate, nest-hole or colony for second brood. Colonial, burrows close together, average 18·5 cm apart (range 10·2-43·2 cm, 20 colonies) in one study, 13·2 cm (1-59 cm, 32 colonies) in another, with small area around burrow entrance defended; colonies often over 100 pairs, sometimes thousands, but majority fewer than 50 pairs, average size of 1222 colonies in Hungarian study was 198 pairs (range 1-3179) with, over 12-year period, 20-60% of population in colonies of over 1000 pairs; breeding synchronous within subgroups of colony. Male initiates burrow-excavation; when burrow at least 30 cm deep, attracts female by singing and flying in circles around entrance, then perches at or hovers in front of it and displays throat patch; sings, sometimes quivering wings, before mounting female, copulations occur in nest, on ground, on wires and on bank face; males frequently chase females to mate with them, also closely follow own mate when she is fertile. Burrow dug by both sexes, mainly male, over 4-5 days, digging rate varies with soil type (in Alaska, c. 3 cm per day in gravel to c. 13 cm per day in coarse soil with gravel); length c. 50-100 cm, average 58-90 cm in various studies, shorter in compact sand and gravel soils than in loose sand, silt or loam, also shorter later in season; breeding more successful in deep burrows; sites include banks of rivers, streams and lakes, sandy cliffs and dunes, sand and gravel quarries, road and railway cuttings, occasionally other artificial sites (e.g. cut peat, building-site excavations, colliery slag heaps, sawdust piles); artificial tunnels such as drainage holes in concrete banks, drainpipes, and holes in walls sometimes used; readily colonizes newly exposed sites; large colonies tend to be in artificial sites or along long banks, e.g. for Hungarian colonies of over 1000 pairs average length of riverbank was 209 m; height of banks used c. 2-3 m (range 0·5-7·6 m), in Saskatchewan (Canada) study higher than banks not used for breeding (1·8 versus 1·4 m), and in England burrows higher in quarries (3·9 m) than in riverbanks (1·8 m); usually nests in upper third of bank; sometimes burrows in horizontal surface, on islands without ground predators; generally, new burrow excavated each season, but old burrow sometimes enlarged and reused; nest of grass, rootlets, plant stalks, leaves and feathers constructed at end of burrow, mainly by female, taking 1-3 days (total time for burrow and nest up to 14 days), feathers added during laying and incubation (and sometimes after hatching), old nests in reused burrows often thrown out and replaced. Clutch 3-6 eggs, typically 4 or 5 (occasionally 2 or 7), clutch size decreasing from N to S and during course of season, e.g. in Britain 45% of 56 clutches were of 5 eggs, 27% of 4, 21% of 6 and 7% of 2-3, and in Hungarian study mean clutch size decreased from 5·78 early in season and 5·46 at peak to 4·68 late in season; egg-dumping by conspecifics recorded (in Scotland only 4% of broods, 1·8% of nestlings, but in Hungary 36% of broods, 11% of nestlings); incubation starts 1-2 days before clutch complete, by both sexes, usually female at night; contribution of male (which lacks brood patch) during day varies, about half of incubation in one study, a third and with shorter bouts (male 7·7 minutes, female 13·8 minutes) in another; incubation period 12-16 days, mostly 14-15 days; eggs hatch over 1-3 days; chicks brooded almost continuously for first few days, brooding declining to c. day 7-10, depending on weather; fed by both sexes, feeding rates varying with weather and with brood size and age, typically 20-30 visits per hour in good weather; by c. 9 days of age nestlings rush to meet parents returning with food, and from c. 15-17 days wait at burrow entrance; fledging period averages 22·3 days in Scotland, only 18·7 days in North America; fledglings return to burrow for 4-5 days, fed by parents for up to a week, form crèches during day and roost in burrows, often not their own. Breeding success 54-78% in various studies; in one study, burrows longer than 70 cm had 73·2% success, while figure for those of 70 cm or less was 50·9%; causes of losses include adverse weather, predation and collapse of nest-site; along R Tisza, in Hungary, flooding every 12-15 years leads to loss of first clutches of c. 20,000 pairs; ectoparasites in reused old nests also reduce breeding success. Recorded longevity 9 years.

Movements. Migratory. Forms flocks and roosts of hundreds or thousands after breeding, roosts of up to c. 2 million individuals recorded. Adults gather at communal roosts and migrate soon after breeding; juveniles prone to wander over large area, moving between roosts. Migrates and roosts with other hirundines. N populations are long-distance migrants: those in North America migrate to South America, mainly S to N Argentina, Paraguay and N Chile, but recorded as far S as Brunswick Peninsula (S Chile), also irregularly in winter in W Mexico; Eurasian breeders winter mainly in Afrotropics, principally in Sahel zone (E from Senegal) and in E Africa S to Mozambique. Routes mainly over land or along coasts with short sea crossings, but in America include West Indies (rare in Lesser Antilles). Autumn migration early Aug to late Sept; present mainly Oct-Mar on wintering grounds, where widespread but sparsely distributed; in Africa most abundant in E & C areas, E breeding populations extending farther S than do W ones; British breeders appear to move E through Sahel during winter and return by a more easterly route than in autumn. Spring passage in E Mediterranean peaks late Apr to early May, in W Mediterranean early Apr; in Middle America and S USA early Mar to May; in N of range mid-Mar to mid-Jun. Males arrive back on breeding grounds before females, and first-years up to 2-3 weeks later than adults; return to same colony in subsequent years, adults more so than first-years, e.g. in Britain 93% of adults and 87% of first-years returned to within 10 km of site where ringed. E Asian race *ijimae* probably winters mainly in S China and SE Asia; uncommon as far S as Malay Peninsula and rare in Philippines, and also recorded in NW India. Egyptian race *shelleyi* moves relatively short distances, as far as S Sudan and NE Ethiopia. Non-breeding range of Kazakhstan race *innominata* uncertain, likely to be in Africa or in SW or S Asia. Species is widespread as a vagrant, with records from, for example, N Alaska, Commander Is, Aleutian Is, Atlantic Ocean (e.g. Faeroes, Madeira, Cape Verde Is, Barbados, Falklands) and New Guinea.

Status and Conservation. Not globally threatened. Generally fairly common to common in most of range. Race *eilata* virtually unknown; recorded only in Israel, on passage, and neither breeding nor non-breeding ranges known. In 1990s, population in Europe and Russia estimated to be c. 2,800,000-14,000,000 breeding pairs. Population trends difficult to determine because of ephemeral nature of breeding sites, movement of individuals between areas, and variable survival rate during migration and winter period; Russian population thought to be stable, that in Sweden thought to fluctuate on cycle of c. 12 years. Droughts in wintering areas, which reduce foraging habitat and food supply, have been associated with severe large-scale population declines in W Europe in 1970-1990, particularly in 1968/69 and again in 1983/84; in 1984, British population c. 10% of peak size in mid-1960s; in studies in Hungary, adult survival rate was related mainly to rainfall in E Africa and Nile Valley during spring migration, although size of local breeding population was dependent on immigration and emigration. North American populations appear largely stable, but declines reported in California (where species listed as "Threatened") and Kentucky (where a Species of Special Concern). Although this species is widespread, suitable breeding sites are localized and often ephemeral, and breeding habitat also often lost through human activities (e.g. flood control and erosion control on rivers), but, conversely, road-building and sand and gravel quarries provide new, albeit often temporary, sites; such activities have led to local changes in range, in North America e.g. contraction in California and expansion in British Columbia, and local declines, as in Connecticut and Virginia. In Europe, because of management of waterways, is largely dependent on artificial breeding sites such as quarries; use of artificial sites in North America variable, only 5% of 111 colonies in California but 96% of 25 colonies in Pennsylvania and Vermont. Number of colonies in Hungary was related to area of suitable nesting habitat. Ideally, needs fresh banks for breeding (to avoid ectoparasites in used nests), and long areas of riverbank that can accommodate large colonies (i.e. of over 1000 pairs), which can hold up to 60% of local population and allow rapid recovery after losses in non-breeding period. Can be attracted to artificially constructed tunnels. On breeding grounds, feeding habitat may also be lost by the use of pesticides on farms.

Bibliography. Abdulali (1975b), Adamian & Klem (1999), Alves (1997), Alves & Bryant (1998, 2003), Asbirk (1976), Ash (1969), Baldaccinni, Frugis & Mongini (1984, 1986), Baldaccinni, Giunchi & Mongini (1999), Barlow *et al.* (1963), Beecher & Beecher (1979, 1983), Beecher, Beecher & Hahn (1981), Beecher, Beecher & Lumpkin (1981), Bent (1942), Bergstrom (1951), Beyer (1938), Birchard *et al.* (1984), Blem (1979), Braillon (1970), Brazil (1991), Bryant & Jones (1995), Bryant & Turner (1982), Bub & Herroelen (1981), Bub & Klings (1968), Campbell, Dawe *et al.* (1997), Cowley (1979, 1983), Cramp (1988), Czerwinski (1996), Dementiev *et al.* (1968), Dickinson & Dekker (2001b), Downhower & Windsor (1971), Dowsett (1971), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Duboc (1999), Ellis (1982), Emlen (1971), Emlen & Demong (1975), Erskine (1979), Freer (1977, 1979), Freer & Belanger (1981), Garrison (1999), Garrison *et al.* (1987), Gaunt (1965), Gavrilov & Savchenko (1991), Gibbons *et al.* (1993), Giunchi *et al.* (1999), Goodman *et al.* (1989), Goroshko (1993), Hagemeijer & Blair (1997), Harrison *et al.* (1997), Harwood & Harrison (1977), Heath *et al.* (2000), Hellyar (1927), Hickman (1979), Hjertaas (1984), Hjertaas *et al.* (1988), Hobson & Sealy (1987), Holmes *et al.* (1987), Hoogland & Sherman (1976), Howell & Webb (1995a), Humphrey & Garrison (1987), Ishikawa & Kudo (1998), John (1991), Jones (1986, 1987a, 1987b, 1987c), Keith *et al.* (1992), Kuhnen (1985), Lethaby (1996), Li Zhenying & Wang Xuequan (1985), Loske (1983), Loskot & Dickinson (2001), Lyuleeva (1974), MacBriar & Stevenson (1976), Malo de Molina (2003a), Marsh (1979), Marsh & Wickler (1982), Mayhew (1963), Mead (1979a, 1979b, 1994), Mead & Harrison (1979a, 1979b), Meservey & Kraus (1976), Moreno & Møller (1996), Morgan (1979), Mrlíkova & Mrlík (1992), Pavlova (1962), Persson (1973, 1987a, 1987b, 1987c), Petersen, A.J. (1955), Petersen, P.C. & Mueller (1979), Phillips (1986), Rappole *et al.* (1995), Ridgely & Tudor (1989), Sargent (1962), Scherrer & Deschaintre (1970a, 1970b), Shirihai (1996), Shirihai & Colston (1992), Sieber (1980, 1985), Smith, R.T. (1994), Snow & Perrins (1998), Spencer (1962), Stoner (1936, 1941), Stoner & Stoner (1941), Stutchbury (1988), Svensson (1986), Szép (1990, 1991a, 1991b, 1991c, 1992, 1993, 1995a, 1995b, 1999a, 1999b), Szép & Barta (1992), Szép & Møller (1999, 2000), Szép, Barta *et al.* (1995), Szép, Szabó & Vallner (2003), Tree (1986c), Turner (1980, 1982b, 1983a), Turner & Bryant (1979), Vaurie (1959), Verheyen (1952), Waugh (1978, 1979), Westerterp & Bryant (1984), Wickler & Marsh (1981), Windsor & Emlen (1975).

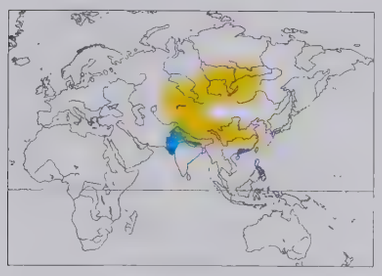
15. Pale Sand Martin

Riparia diluta

French: Hirondelle pâle **German**: Fahluferschwalbe **Spanish**: Avión Pálido
Other common names: Pale Martin

Taxonomy. *Cotile diluta* Sharpe and Wyatt, 1893, Chimkent, north of Tashkent, Kazakhstan.
Forms a superspecies with *R. paludicola*, *R. congica* and *R. riparia*. Until recently considered conspecific with last, but differs morphologically and vocally, and found in separate breeding colonies in wide area of sympatry (full extent of which not yet clear). Six subspecies recognized.

Subspecies and Distribution.
R. d. gavrilovi Loskot, 2001 - breeds C Siberia E to R Lena, and Cisbaikalia S to Altai and Tuva Republic.
R. d. transbaykalica Goroshko, 1993 - breeds Transbaikalia.
R. d. diluta (Sharpe & Wyatt, 1893) - S & SE Kazakhstan; winters NW India and Nepal.
R. d. indica Ticehurst, 1916 - Pakistan and N India.
R. d. fohkienensis (La Touche, 1908) - C & E China.
R. d. tibetana Stegmann, 1925 - SW China (Xizang-Qinghai Plateau).



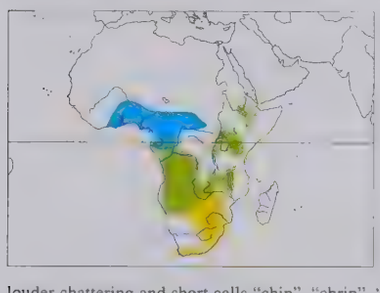
Descriptive notes. 12 cm. Nominate race is pale grey brown above, remiges and rectrices darker brown, tail shallowly forked; underparts dingy white, weakly defined pale brown breastband; underwing brown; hind tarsus feathered. Distinguished from similar *R. riparia* by paler and greyer upperparts, rather dingier underparts with less well-defined breastband. Sexes alike. Juvenile has pale feather edges on upperparts. Races separated by size, N populations being larger, and by depth of colour of upperparts and size and colour of breastband: *gavrilovi* has darker upperparts than nominate, and darker, more clear-cut breastband; *transbaykalica* is large, with dark upperparts with reddish tint, browner head; *indica* is small; *fohkienensis* is also small, but larger than previous, and dark; *tibetana* is darker than nominate. Voice. Song is a short, grating twittering; when flying around breeding colony, makes a hard "ret" or "brrit".
Habitat. Mainly open country, often near water; in area of sympatry with *R. riparia* in arid steppe, farther from water sources than latter. Up to c. 4500 m in Himalayas. Roosts in reedbeds.
Food and Feeding. Diet not fully documented, probably similar to that of *R. riparia*. Forages in groups, and mixes with other hirundines and swifts (Apodidae). Fast and fluttery flight, with shallow, rapid wingbeats.
Breeding. Nov-May, mainly Feb-Apr. Colonial, usually small colonies, up to c. 150-200 nests. Nest in burrow in bank, e.g. along stream or river, at lake or in road cutting, nest of grass and feathers at end of burrow. Clutch 3 or 4 eggs in India, 4-7 in China; no further information.
Movements. N populations migratory, but wintering sites poorly known; nominate race probably winters mainly in N India, but recorded as far W as Egypt; *fohkienensis* winters in S China. Reported from NE Vietnam; may winter more widely in SE Asia, but possibly not recognized as being distinct from *R. riparia* (of race *ijimae*).
Status and Conservation. Not globally threatened. Locally common. Both breeding and non-breeding distributions poorly known, require further study. Breeding sites probably local and ephemeral as for *R. riparia*, and affected by similar factors, such as flooding of nests.
Bibliography. Abdulali (1975b), Ali & Ripley (1987), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cramp (1988), Dementiev *et al.* (1968), Dickinson & Dekker (2001b), Étchécopar & Hüe (1983b), Gavrilov & Savchenko (1991), Goroshko (1993), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Inskipp & Inskipp (1991), Loskot (2001), Loskot & Dickinson (2001), MacKinnon & Phillipps (2000), Ripley (1982), Roberts (1992), Robson (2000), Stuart Baker (1934).

16. **Banded Martin**

Riparia cincta

French: Hirondelle à collier **Spanish**: Avión Cinchado
German: Weißbrauen-Uferschwalbe
Other common names: Banded Sand Martin

Taxonomy. *Hirundo Cincta* Boddaert, 1783, Cape of Good Hope, South Africa.
Relationship to others in genus not clear; has sometimes been placed in a monotypic genus *Neophedina* on basis of its large size, bill and nostril shapes, loral bristles, squarer tail and more solitary lifestyle. Initial DNA-DNA hybridization studies also did not support a close relationship, but cytochrome *b* data suggest that this species and *R. riparia* are sister-taxa. Five subspecies recognized.
Subspecies and Distribution.
R. c. erlangeri Reichenow, 1905 - Ethiopia.
R. c. suahelica van Someren, 1922 - S Sudan, E & SE DRCongo, Uganda, W Kenya, Rwanda, Burundi, NW & S Tanzania, Zambia, Malawi, N Zimbabwe and W Mozambique.
R. c. parvula Amadon, 1954 - N Angola (N Bengo E to Lunda Norte), SW DRCongo and NW Zambia, possibly also S Gabon and S PRCongo; migrates N at least to Cameroon.
R. c. xerica Clancey & Irwin, 1966 - W & S Angola (Cabinda, and S Bengo and Luanda E to S Lunda Sul and Moxico and S to Huíla), N Namibia and N Botswana, possibly also NW Zimbabwe.
R. c. cincta (Boddaert, 1783) - S Zimbabwe, SE Botswana, South Africa, Lesotho and Swaziland; migrates N at least to Angola and DRCongo.



Descriptive notes. 17 cm; 19-30 g. Has blackish lores and line through eye, white stripe from base of bill to above eye; crown and upperparts, including wings and tail, dark brown, tail square; underparts white, brown breastband. Differs from *R. riparia* in larger size, white supercilium. Sexes alike. Juvenile has rufous to cream feather edges on upperparts, pale breastband. Races differ in size and in shade of brown: *erlangeri* is larger than nominate, has narrower breastband; *suahelica* is darker; *xerica* is pale; *parvula* resembles last, but has broader breastband. Voice. Song is a squeaky warbling, sometimes ending in a trill; also a louder chattering and short calls "chip", "chrip", "kip".
Habitat. Open country, such as grassland, savanna, cultivation, often near water. Up to 3000 m. Roosts in reedbeds.
Food and Feeding. Diet includes beetles (Coleoptera), moths and their caterpillars (Lepidoptera), flies (Diptera), mantids (Mantodea), lacewings (Neuroptera). Forages alone or in small groups, sometimes with other swallows and swifts (Apodidae); flight slow and deliberate. Feeds around large animals; attends grass fires. Occasionally takes insects, such as caterpillars, plucking them from vegetation.
Breeding. May-Aug in Ethiopia, Feb-Jun and Aug-Sept in E Africa, Jul in DRCongo, mostly Nov-Dec in Angola, and Aug, Oct and Dec-Jan in Zambia; mainly Sept-Apr in S, with early peak in SW Cape. Solitary. Digs burrow in vertical bank, e.g. along river or embankment, near water, burrow usually c. 60-90 cm long, but 40-50 cm recorded in hard ground; roof of aardvark (*Orycteropus afer*) burrow, disused starling (Sturnidae) burrow and drainage pipe also occasionally used; nest-chamber lined with grass and feathers. Clutch 2-5 eggs, 2-4 in S Africa; incubating bird said to be fed by mate, incubation period not recorded; both sexes feed chicks, one visit every 10 minutes, fledging period 21-24 days. Longevity at least 4 years.
Movements. Mainly resident, with some poorly known local movements; S populations migratory. Post-breeding flocks of tens of birds, once c. 1000. Breeding visitor to S Africa, present mainly Sept-Apr, but Aug-Feb in SW Cape and to late May/early Jun in EC areas; passage N in Zimbabwe and Botswana Apr-May, return passage less obvious; some overwinter in breeding range, especially in N, e.g. present all year in N Botswana (nomadic in Okavango). Non-breeding visitor to W Africa, mainly May-Oct, although some suggestion of breeding as well. Nominate race migrates N at least to Angola and DRCongo after breeding, is an uncommon visitor in W Africa; *erlangeri* is resident, although reported a few times from Kenya; *suahelica* is mainly resident, but is a breeding visitor to Zimbabwe; *parvula* migrates N at least to Cameroon, possibly W Africa; *xerica* non-breeding sites not known, may be resident, or may migrate, possibly to W Africa, and be replaced by other migrants. Vagrants recorded in Egypt and N Yemen.
Status and Conservation. Not globally threatened. Generally uncommon and local; locally common in parts of E Africa and frequent in Ethiopia; widespread in grasslands of Swaziland and S Africa, where common in E. Does not use artificial sites to any great extent; has probably benefited little from presence of humans, although agricultural development may provide new breeding areas, e.g. in SW Cape.
Bibliography. Aspinwall (1983), Bannerman (1939, 1953), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Britton (1980), Byaruhanga *et al.* (2001), Christy & Clarke (1994, 1998), Clancey (1964b, 1966c), Clancey & Irwin (1966), Clements (1990), Critchley (1975), Dean (2000), Dowsett & Dowsett-Lemaire (1991, 1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1973), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Irwin (1981), Jones & Tye (1988), Keith *et al.* (1992), Lewis (1989), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), van der Merwe (1986), Nikolaus (1987), Penry (1994), Rand *et al.* (1959), Roberts, A. (1922), Saunders & Webbon (1998), Sessions (1966), Short *et al.* (1990), Sinclair & Hockey (1996), Snow & Perrins (1998), van Someren (1956), Stark & Sclater (1900), Stevenson & Fanshawe (2002), Tarboton (2001), Tree (1973, 1986a), Urban & Brown (1971), Vincent (1944), Zimmerman *et al.* (1996).

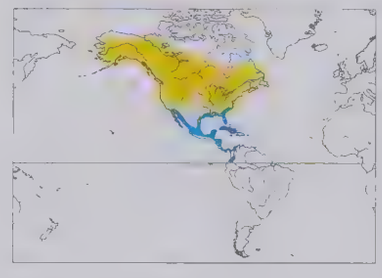
Genus *TACHYCINETA* Cabanis, 1850

17. **Tree Swallow**

Tachycineta bicolor

French: Hirondelle bicolore **German**: Sumpfschwalbe **Spanish**: Golondrina Bicolor

Taxonomy. *Hirundo bicolor* Vieillot, 1808, New York, USA.
Has been placed with *T. albilinea* (and, by extension, *T. stolzmanni*), *T. albiventer*, *T. leucorrhoa* and *T. meyeni* in separate genus *Iridoprocne*. DNA studies, however, indicate close relationship of these with clade consisting of *T. thalassina*, *T. euchrysea* and *T. cyaneoviridis*, and support placement of all these taxa in a single genus. One record of hybridization with *Petrochelidon pyrrhonota*. Monotypic.
Distribution. N & C North America from W & C Alaska and Canada (N Yukon, NW & S Mackenzie, N Saskatchewan and Manitoba E to NC Quebec, C Labrador and Newfoundland) S in USA to S California, C Nevada, N Arizona, N New Mexico, Texas (irregular), N Alabama, N Georgia and North Carolina (casual in NE Louisiana and Mississippi); winters mainly S USA coasts and West Indies S to N coast of South America.



Descriptive notes. 14 cm; 17-25·5 g. Male is glossy blue-green above, wings and tail blackish, tail shallowly forked; underparts white, underwing-coverts grey-brown. Differs from *T. thalassina* in glossy plumage, no white above and behind eye, no white on rump side. Female is duller than male, sometimes with brown forehead. Juvenile has brown upperparts and grey-brown wash on breast, resembles *Riparia riparia* but larger, without distinct breastband; first-year female is brown above with variable number of blue feathers, a few 2-year-old females still having some brown feathering. Voice. Large vocal repertoire: "dawn song" is a repetition of a few phrases sung around dawn by males in flight above and at nest-site; during the day, song is briefer and less continuous; calls include a contact call "buli-dulidulit", a nest-site advertising call "she-she-she-shet", an alarm call "peeh" or "pee-deeh", a distress call "zhjizhj", a gurgling call uttered by male to mate, an anxiety call "euree", aggressive calls "zjiht" and "tick-tick-tick", a submission call "tee", a pair interaction call and a copulation solicitation call "chi-chit".
Habitat. Open areas, especially near water, such as lakes, marshes and ponds; requires trees with suitable holes for nesting (but also breeds N of tree-line, in nestboxes). Feeds over water and fields, often in lee of wind. Roosts in marshes, trees.
Food and Feeding. Mostly insects, also molluscs, spiders; some fruits. In samples taken throughout North America, diet consisted of 40% flies (Diptera), 14% beetles (Coleoptera) and 6% ants (Hymenoptera). Nestling diet in New York State c. 58% dipteran flies (Nematocera, Brachycera), c. 18% hemipteran bugs and c. 14% Odonata; in various studies in Ontario, 46-53% Diptera, 9-26% homopteran bugs, 11-16% mayflies (Ephemeroptera), 4-5% Odonata, 2-4% beetles, 2-4% Mollusca, and a few psocids (Psocoptera), hymenopterans, hemipterans, lacewings (Neuroptera), caddis flies (Trichoptera), Lepidoptera and spiders (Araneae); at other sites up to 90% Diptera. Prey mainly 1-10 mm (up to 60 mm). Nematocerans, especially Chironomidae, important, 44-92% of nestling diet in various studies; in acidic wetlands, more aquatic dipterans and fewer ephemeropterans taken. Also eats seeds and berries, mainly of bayberry (*Myrica*), especially in autumn, winter and spring; large flocks, some of more than 50,000 individuals, strip shrubs in a few minutes. Birds wintering on Long I (New York) had eaten mainly crustaceans, as well as water boatmen (Heteroptera), spiders, and seeds of bulrush (*Typha*), sedge (Cyperaceae), bayberry and smartweed (*Polygonum hydropiper*). Forages singly or in groups; large numbers sometimes gather at insect swarms. Flies 0-50 m or more above ground, and mostly within 4 km of nest-site; when feeding nestlings, usually 100-200 m from nest and up to 12 m above ground. Flight a mix of flapping and gliding. Will take insects from ground, water, vertical surfaces and vegetation.
Breeding. Laying mainly early May to mid-Jun, earlier in S of range than in N, fledging mid-Jun to Jul; single-brooded. Socially monogamous, but 0-8% of breeding males polygynous and extra-pair

paternity very common (38-69% of nestlings in 50-87% of broods, and broods often contain nestlings sired by several males; female apparently actively selects or rejects extra-pair males). Solitary, or in loose groups with nests usually at least 10-15 m apart; both sexes defend extra nest-sites in territory. Courtship includes vertical display posture by male; responsive female supplants male on perch, male goes to nest-hole and gives high-pitched call; copulation on perch near nest; male does not guard mate during her fertile period. Nest a hollowed-out pad of grass, pine needles, moss and aquatic plants, cup lined with feathers, material brought mostly by female; in pre-existing hole, usually in tree, sometimes in pipe, fence post or other artificial site, nestboxes frequently used. Clutch 2-8 eggs, usually 4-7, mean 5·4, clutch size declines through season; incubation by female alone, period 11-19 days, usually 14-15 days; hatching usually synchronous, but in poor weather asynchronous with resultant weight hierarchy among young; chicks fed by both parents, c. 10-20 feeds per hour, male provisions less than female, and polygynous males feed only brood of first mate; fledging c. 18-22 days. Average hatching success c. 88%, fledging success c. 80%, slightly lower for yearling females than for older ones and reduced by poor weather; in Saskatchewan (Canada) nestbox study, only 27·7% of nests fledged any young in a year with cold wet weather, compared with 62% in a hot dry year and peak of 89·6% in a third year; hatching success and nestling growth also poorer in acidic wetlands; also, availability of nest-sites often limited, competition for breeding opportunities sometimes leads to infanticide; annual mortality 79% in first year, 40-60% subsequently. Longevity 12 years.

Movements. Migratory. Large post-breeding flocks, sometimes hundreds of thousands in roosts. Normal winter range extends from W California and SW Arizona and, in E, from S New Jersey, S Florida (irregular Florida Keys) and Gulf coast, S to Mexico and, in smaller numbers, to Panama and NW coast of South America, in Caribbean including N Bahamas, Greater Antilles, Cayman Is, Swan Is (N of Honduras); sometimes winters along US Atlantic coast as far N as New York (Long I) and E Massachusetts. Possibly resident in S California. Migration peaks in early to mid-autumn; birds from E coast and E Great Lakes probably migrate down Atlantic coast to winter mainly in Florida and Caribbean; those from Canadian prairies and Midwest may move through Mississippi Basin to Gulf coast and Central America. Returns early in spring, mid-Mar to early Apr; 13-60% of breeding adults return to same area to breed; females less site-faithful than males, especially after breeding failure, will move to locality 15-30 km from previous one. Vagrants recorded within Arctic Circle (N to Seymour I and Banks I, Keewatin and Boothia Peninsula, also Wrangel I), in extreme N Pacific (St Lawrence I, Pribilof Is, Aleutian Is), in Greenland, in mid-ocean at Clipperton Atoll (W of Central America), and in Europe (Britain).

Status and Conservation. Not globally threatened. Total population estimated at c. 20,000,000 birds. Abundant in E Canada and NE USA (New England and Adirondack Mts). Since 1980, range has extended S in parts of USA (Texas, Oklahoma, Missouri, Arkansas, Kentucky, Tennessee, Alabama, Georgia, N Carolina), believed facilitated by changes in land use (e.g. reservoir creation), reintroduction of beavers (*Castor canadensis*), and provision of nestboxes for bluebirds (*Sialia*), which this hirundine also exploits. Population probably limited by availability of nest-sites; nestboxes can increase numbers locally (e.g. in Virginia and Kentucky), but species probably also adversely affected by forest clearance and removal of dead trees and subsequent loss of natural sites. Suffers from competition for nest-sites with introduced Common Starling (*Sturnus vulgaris*) and House Sparrow (*Passer domesticus*). Drainage of marshes reduces suitable habitat in wintering areas. Possibly adversely affected by acid rain, as acidity of wetlands influences type of prey available, in particular calcium-rich items. Pesticides and pollutants, acquired from insect food, sometimes reach high concentrations in the birds and their eggs; few effects on breeding success recorded, but PCB contamination has been associated with adults abandoning eggs, fewer eggs hatching, and possibly poor nest quality. Severe cold weather leads to high mortality in winter and spring.

Bibliography. Acosta & Múgica (1990), Austin & Low (1932), Barber & Robertson (1998, 1999), Barber *et al.* (1996, 1998), Beasley (1996), Bent (1942), Bishop, Boermans *et al.* (1998), Bishop, Koster *et al.* (1995), Bishop, Mahoney *et al.* (1999), Bishop, Van der Kraak *et al.* (1998), Blancher & McNicol (1988, 1991), Blancher *et al.* (1987), Burgess *et al.* (1999), Burness *et al.* (1998), Butler (1988), Campbell, Dawe *et al.* (1997), Capreol (1983), Chaplin *et al.* (2002), Chek & Robertson (1991, 1994), Cohen (1977, 1978a, 1978b, 1980, 1982, 1984a, 1984b, 1988a, 1988b, 1989a, 1989b), Cohen & Dymerski (1986), Conrad *et al.* (2001), Custer *et al.* (1998), Davis & Kalisz (1994), DeWeese *et al.* (1985), Dunn, E.H. (1979), Dunn, P.O. & Hannon (1991, 1992), Dunn, P.O. & Robertson (1992, 1993), Dunn, P.O. & Winkler (1999), Dunn, P.O., Robertson *et al.* (1994), Dunn, P.O., Thusius *et al.* (2000), Dunn, P.O., Whittingham *et al.* (1994), Elliott (1939), Field (1971), Finch (1990), Froese *et al.* (1998), Grubb (1973), Harris (1979), Hasselquist *et al.* (2001), Hausman (1927), Holroyd (1975), Holt & Martin (1997), Horn (1996), Houston & Houston (1987, 1998), Howell & Webb (1995a), Hussell (1982, 1983a, 1983b, 1988, 2003), Hussell & Anderson (1999), Hussell & Quinney (1987), Jones (2003), Kempenaers, Congdon *et al.* (1999), Kempenaers, Everding *et al.* (2001), Kempenaers, Lanctot & Robertson (1998), Kilham (1980), Kuerzi (1941), Lederle (1998), Lee (1993), Leech & Leonard (1996), Leffelaar & Robertson (1984, 1985, 1986), Leonard & Horn (1996, 1998), Leonard, Fernández & Brown (1997), Leonard, Horn *et al.* (1997), Lethaby (1994, 1996), Lifjeld & Robertson (1992), Lifjeld *et al.* (1993), Lombardo (1985, 1986a, 1986b, 1986c, 1986d, 1987a, 1987b, 1988, 1991, 1994, 1995, 2001), Lombardo, Bosman *et al.* (1995), Lombardo, Forman *et al.* (2002), Lozano (1994), Lozano & Handford (1995), Marsh (1980), McCarty (1996, 1997, 2001), McCarty & Secord (1999a, 1999b), McCarty & Winkler (1999a, 1999b), Mengelkoch *et al.* (2004), Michaud & Leonard (2000), Mitchell & Robertson (1993, 1996), Morrill & Robertson (1990), Muldal *et al.* (1985), Murphy (2000a), Paynter (1954), Peer *et al.* (2000), Pinel (1980), Quinney (1983, 1986), Quinney & Ankney (1985), Quinney *et al.* (1986), Ramstack *et al.* (1998), Rendell (1987, 1993), Rendell & Robertson (1989, 1990, 1993, 1994), Rendell & Verbeek (1996a, 1996b), Robertson (1990), Robertson & Gibbs (1982), Robertson & Rendell (1990), Robertson & Stutchbury (1988), Robertson, Gibbs & Stutchbury (1986), Robertson, Stutchbury & Cohen (1992), Rogers *et al.* (1991), Rooneem & Robertson (1997), Rustad (1972), Secord *et al.* (1999), Sharman *et al.* (1994), Shaw (1984), Sheppard (1977), Slagsvold & Tohwer (2000), Smits *et al.* (2000), St. Louis & Barlow (1993), St. Louis & Breebaart (1991), St. Louis, Breebaart & Barlow (1990), St. Louis, Breebaart, Barlow & Klaverkamp (1993), de Steven (1978, 1980), Stewart & Robertson (1999), Stocek (1970, 1986), Stutchbury & Robertson (1985, 1987a, 1987b, 1987c, 1987d, 1988, 1990), Stutchbury & Rohwer (1990), Tate & Weaver (1966), Teather (1996), Thomas & Shutler (2001), Tuttle (1987), Venier & Robertson (1991), Wardrop & Ydenberg (2003), Weatherhead (1984), Weatherhead *et al.* (1985), Weydemeyer (1934a, 1934b, 1935), Wheelwright & Dorsey (1991), Wheelwright & Schultz (1994), Wheelwright *et al.* (1991), Whittingham & Dunn (2001), Whittingham, Dunn & Robertson (1994, 1995), Whittingham, Slikas *et al.* (2002), Wiggins (1989, 1990a, 1990b, 1990c, 1991), Wiggins & Pärt (1995), Williams (1988), Winkler (1991, 1992, 1993, 1994), Winkler & Allen (1995, 1996), Yunick (1971), Zach (1982), Zach & Mayoh (1982a, 1982b, 1984, 1986).

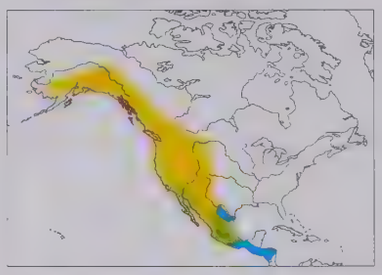
18. Violet-green Swallow

Tachycineta thalassina

French: Hirondelle à face blanche **German**: Veilchenschwalbe **Spanish**: Golondrina Verdemar

Taxonomy. *Hirundo thalassinus* Swainson, 1827, Real del Monte, Hidalgo, Mexico.
Closely related to *T. euchrysea* and *T. cyaneoviridis*. Population from Alaska and Canada S to Arizona, New Mexico and Baja California sometimes treated as separate race *lepida*. Two subspecies recognized.

Subspecies and Distribution.
T. t. thalassina (Swainson, 1827) - C Alaska and W Canada (S from N Yukon, SW Mackenzie, N British Columbia, WC Alberta, SW Saskatchewan) S in W USA (E to W North Dakota and NW Nebraska) to S Arizona and S New Mexico, and Mexico (S to C Baja California, also on plateau S to Oaxaca and Veracruz); winters Baja California S to Costa Rica.
T. t. brachyptera Brewster, 1902 - NW Mexico (C & S Baja California, S Sonora).



Descriptive notes. 12-13 cm; 14-16 g. Male has forehead to nape matt green, nape with violet tinge, side of head, including area above and behind eye, white; back matt green, rump and uppertail-coverts violet-blue, extensive white on side of rump (can appear white-rumped); wings and tail black, tertials edged white when fresh, tail short and shallowly forked; underparts white, underwing-coverts pale grey. Differs from *T. bicolor* in having matt plumage, more extensive white on head side, white on rump side. Female is duller, with browner head. Juvenile is browner. Race *brachyptera* is smaller than nominate, has less of a violet sheen on scapulars and back, rump variable. Voice. Twitter call is used in territorial and courtship contexts; other calls include a contact call "chee-chee" and an alarm call.

Habitat. Open deciduous, coniferous and mixed woodland; also other open areas, such as cliffs, deserts or prairies, if suitable nesting sites available. Usually at 2000-3500 m in S, at lower elevations and coastal in N; breeds at up to 4000 m, but commonest at 1500-3000 m. Often near water on migration. On wintering grounds typically in low-elevation habitats such as valleys, coastal plains and intertidal flats, but also over plains and forest in mountainous areas to 3000 m, occasionally to 3700 m.

Food and Feeding. Insects. In samples taken throughout North America, diet consisted of 36% Hemiptera (leafhoppers, leafbugs), 29% flies (Diptera), 23% hymenopterans (mostly ants, some wasps and bees), 11% beetles (Coleoptera); moths (Lepidoptera) and mayflies (Ephemeroptera) also recorded. Forages in small groups or loose flocks, both low over ground or water and high up, often higher than other hirundines. Sometimes in flocks with other swallows and swifts (Apodidae). Flight a mix of fast flapping and gliding, wingbeats more rapid than those of *T. bicolor*. Has been recorded as feeding on the ground.

Breeding. Mainly May-Aug, from Feb in Mexico; single-brooded. Solitary, or in groups of typically up to 25 pairs, occasionally more than 50 pairs; nests in Colorado were at least 1 km apart. Male guards female during nest-building and egg-laying. Nest made of grass, rootlets, straw and twiglets, with feather lining, built mainly by female, work takes from a few days to a few weeks; placed in hole in tree, cliff or, occasionally, bank or wall or in other swallow nest, or nestbox used; in hole in cactus in NW Mexico (*brachyptera*). Clutch 2-7 eggs, usually 4-6; incubation by female, period 14-15 days; hatching over more than 1 day, up to 5 days, chicks fed by both parents, female more than male, intervals between feeds a few minutes (in one case, range 20 seconds to 4 minutes), fledging 23-24 days; young remain near nest and fed by parents for a few days.

Movements. Nominate race mainly a long-distance migrant, winters from S Sonora and the Mexican Plateau S to Honduras and El Salvador, occasionally to Costa Rica; resident in Mexico, and reported to occur in winter also in C & S California, and casually to C Arizona and W Panama. Forms flocks before and during migration. Main autumn passage early Aug to late Oct; return migration mid-Mar to early May, males arriving before females; often returns to same site in successive years, e.g. in Colorado 84% of females returned to breeding site, 44% to previous year's nest-site. Race *brachyptera* moves from mountains to lower elevations in Mexico. Vagrant to Aleutian Is, also to E of range in e.g. Manitoba, Ontario, Ohio, New Jersey, C Texas, Yucatán, and in S to N Colombia; also several sight reports E to Nova Scotia and New Hampshire.

Status and Conservation. Not globally threatened. Total population estimated at c. 11,000,000 birds. Generally fairly common to common, especially in mountain ranges around Los Angeles (California). Population has increased in N Plains States, but decreased locally in Mexico. May have benefited from provision of nest-sites by humans, but suffers competition for nest-sites with introduced Common Starling (*Sturnus vulgaris*) and House Sparrow (*Passer domesticus*); has probably lost natural sites through deforestation.

Bibliography. Anon. (1998a), Armstrong (1983), Baicich & Harrison (1997), Beasley (1996), Bent (1942), Binford (1989), Blem & Blem (1993), Brawn (1990), Brawn & Balda (1988a), Brown (1983b), Brown *et al.* (1992), Campbell, Dawe *et al.* (1997), Cohen (1982, 1987, 1994a, 1994b), Combellack (1954), Contreras (1997), DeGraaf & Rappole (1995), Edson (1930, 1943), Erskine (1979, 1984), Finch, D.M. (1991), Franzreb (1976), Freemark *et al.* (1995), Gander (1934), Godfrey (1986), Gullion (1947a), Hejl *et al.* (1995), Hellmayr (1935), Hobson & Sealy (1987), Howell & Webb (1995a), Johnsgard (1979), Kaufman (1996), Knight (1995), Lasiewski & Thompson (1966), Oberholser (1974), Paynter (1995), Peterjohn *et al.* (1995), Phillips (1986), Phillips *et al.* (1964), Pinkowski (1981), Price *et al.* (1995), Rappole *et al.* (1995), Robbins *et al.* (1986), Root (1988), Sauer & Droege (1992), Scott *et al.* (1977), Shirling (1935), Small (1994), Stiles (1980), Urban (1959).

19. Golden Swallow

Tachycineta euchrysea

French: Hirondelle dorée **German**: Antillenschwalbe **Spanish**: Golondrina Dorada

Taxonomy. *Hirundo euchrysea* Gosse, 1847, Jamaica.
Has sometimes been placed in a separate genus *Lamprochelidon* or *Kalochelidon*. DNA studies, however, indicate close relationship with *T. thalassina* and *T. cyaneoviridis*. Two subspecies recognized.

Subspecies and Distribution.
T. e. euchrysea (Gosse, 1847) - Jamaica.
T. e. sclateri (Cory, 1884) - Hispaniola (Haiti and Dominican Republic).

Descriptive notes. 12 cm. Male is strongly iridescent bronzy green to coppery bronze above, upperparts often appearing golden; wings and tail dusky bronze-green, tail slightly forked; underparts white, underwing-coverts dusky with bronze-green margins. Female is similar but duller, with some grey-brown mottling on breast. Juvenile is duller and browner, with extensive grey-brown mottling on breast. Race *sclateri* is less golden, has longer wings, smaller bill, deeper tail fork. Voice. A "tchee-weet" call has been recorded.

Habitat. Montane humid forest and pine (*Pinus*) forest at up to 2000 m, also secondary forest. Forages also over open country, cultivation.

Food and Feeding. Diet includes beetles (Coleoptera) and parasitic wasps (Hymenoptera). Feeds alone or in small groups, often low over the ground.



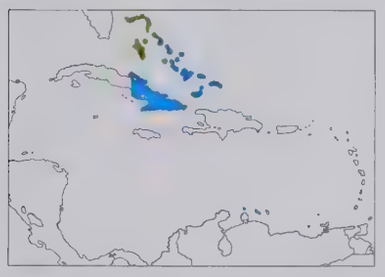
Breeding. Jun-Jul in Jamaica; also Apr in Haiti. Often colonial. Nest made of vegetable fibres, lined with fibres and feathers, placed in cavity, such as old woodpecker (Picidae) hole, in dead pine tree, or in cave, among boulders in old mine, or in eaves of building. Clutch 3 eggs.
Movements. Resident; may move to lower altitudes after breeding.
Status and Conservation. VULNERABLE. Restricted-range species: present in Jamaica EBA and Hispaniola EBA. Total population estimated at 2500-10,000 individuals within small and fragmented range of 8200 km²; both numbers and range decreasing. Legally protected in Jamaica, where nominate race was common in 19th century; now very rare and local, occurring in Cockpit Country and across C highlands to Blue Mts and environs; few recent records. Race *sclateri* is locally common, particularly in Cordillera Central, Sierra de Baoruco and Massif de la Selle, but has also declined. Clearance of forest for agriculture has severely reduced suitable habitat on Hispaniola; loss of nest-sites may also be responsible for decline on Jamaica. Occurs in several protected areas where some habitat survives, as in La Visite and Macaya National Parks, in Haiti, and Cockpit Country and the Blue and John Crow Mts, in Jamaica; the Jamaican reserves, however, are not managed. Six montane-forest areas in Dominican Republic have been proposed as protected areas. Target conservation measures are to identify breeding sites, officially to designate proposed protected areas, to consider a nestbox scheme, and to prepare management plans for main reserves.
Bibliography. Bangs & Kennard (1920), Bond (1928a, 1943, 1961a, 1985), Dod (1987, 1992), Downer (1982), Faaborg (1985), Fernández & Keith (2003), Hellmayr (1935), Keith *et al.* (2003), King (1978/79), March (1863), Osburn (1858, 1869), Raffaele *et al.* (1998, 2003), Ridgway (1904), Sheldon (1998), Stattersfield & Capper (2000), Stotz *et al.* (1996), Sutton (1973), Wetmore & Lincoln (1933), Wetmore & Swales (1931), Woods & Ottenwalder (1986).

20. Bahama Swallow

Tachycineta cyaneoviridis

French: Hirondelle des Bahamas **Spanish**: Golondrina de las Bahamas
German: Bahamaschwalbe

Taxonomy. *Hirundo cyaneoviridis* H. Bryant, 1859, New Providence, Bahama Islands.
Has sometimes been placed in a separate genus *Callichelidon*. DNA studies, however, indicate close relationship with *T. thalassina* and *T. euchrysea*. Monotypic.
Distribution. N Bahamas (islands of Grand Bahama, Great Abaco and Andros, possibly also New Providence); in non-breeding season S to E Cuba.



Descriptive notes. 15 cm; 16·3-19·5 g. Male has forehead to back green, rump bluish-green; wings and tail blue, tail strongly forked; underparts and underwing-coverts white. Differs from *T. bicolor* in blue, rather than black, wings, deeply forked tail. Female is duller than male, underparts less pure white, tail shorter. Juvenile is duller and browner, with shorter tail. Voice. A metallic "chep" or "chi-chep" call has been recorded.
Habitat. Caribbean pine (*Pinus caribaea*) forest; also around human habitations. Forages in open areas, such as woodland clearings, fields, marshes and coastal areas.
Food and Feeding. Diet includes flies (Diptera) and beetles (Coleoptera). Feeds both low over ground and high up, often gliding. Forms small flocks.
Breeding. Late Apr-Jul; usually single brood but, of 12 nests, at least one and possibly three were second broods. Solitary or in groups; nests in pines c. 150 m apart. Nest made of pine needles, *Casuarina* twigs, and grass, lining typically of pine bark and feathers, but dry leaves, shed lizard skin, flower petals, a butterfly wing, turtle grass, paper, shredded plastic and paint chips also recorded; typically in old woodpecker (Picidae) hole in dead Caribbean pine tree, also in other cavity in tree, at average height of 8·8 m (range 6-11·4 m), sometimes in artificial cavity in various sites, including street light, pipe, wall, electrical conduit box, rooftop ventilation unit, nestbox and artificial gourd, nest larger in artificial sites. Clutch 2-4 eggs, usually 3; incubation probably by female only, period 15-17 days; hatching over 1-2 days, chicks fed by both parents, fledging 22-25 days. Hatching success 87%, fledging success 81%.
Movements. After breeding, spreads throughout Bahamas and S to E Cuba, some irregularly W to S Florida, Florida Keys and Dry Tortugas. A few appear to remain on breeding grounds.
Status and Conservation. VULNERABLE. Restricted-range species: present in Bahamas EBA. Population estimated at 4800 individuals; decreasing. Range small and fragmented. Breeding population on New Providence possibly extinct or, at least, very small. Pine forest limited in extent, and was logged extensively in 1950s. Further logging and proposed housing developments would reduce available habitat. Areas of forest also destroyed by hurricanes. Some competition for nest-sites with introduced Common Starlings (*Sturnus vulgaris*) and House Sparrows (*Passer domesticus*). In 1995, a nestbox scheme was started on Grand Bahama in order to provide extra sites, but only three of 227 boxes were occupied. Target conservation measures are assessment of species' status and that of its breeding habitat, determination of its precise non-breeding distribution and habitat requirements, implementation of a programme to manage its main nest-sites (pine snags), and monitoring of use of nestboxes.
Bibliography. Allen (1996, 1997a, 1997b, 1998), Allen & Hitchcox (1997), Anon. (1996c, 1998a), Arendt (1992), Bangs (1914), Bent (1942), Bond (1985), Brudenell-Bruce (1975), Bryant (1859), Buden (1987a), Collar & Andrew (1988), Collar *et al.* (1992), Cory (1890), Emlen (1977), Garrido & Kirkconnell (2000), Hellmayr (1935), Kaufman (1996), Mlodinow & O'Brien (1996), Paterson (1972), Raffaele *et al.* (1998), Riley (1905), Smith & Smith (1989, 1990), Stattersfield & Capper (2000), Stotz *et al.* (1996), Todd & Worthington (1911), Wardle (1995).

21. Tumbes Swallow

Tachycineta stolzmanni

French: Hirondelle de Stolzmann **Spanish**: Golondrina de Tumbes
German: Stolzmannschwalbe

Other common names: Chepen/Stolzmann's/West Peruvian Swallow

Taxonomy. *Hirundo Stolzmanni* R. A. Philippi [Krumwiede], 1902, Chepen, La Libertad, Peru.
Forms a superspecies with *T. albilinea* and *T. albiventer*; was for many years considered conspecific with former, but differs in nest structure, flight call and morphology, and recent cytochrome *b* data also support treatment as separate species. Monotypic.
Distribution. Coast of SW Ecuador (Loja) and NW Peru (S to La Libertad).



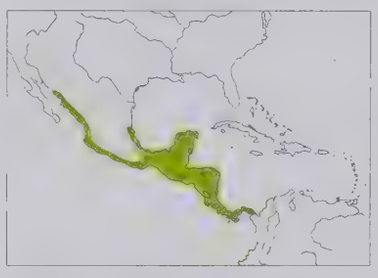
Descriptive notes. 13 cm; 11-12 g. Has glossy blue-green forehead to back, sometimes very thin pale supraloral streak (often absent); rump white, dusky shaft streaks on uppertail-coverts; wings and tail black, tail shallowly forked; underparts white with grey wash, especially on breast, dusky shaft streaks; underwing-coverts smoky grey. Distinguished from very similar *T. albilinea* by lack of (or indistinct) white line above lores, greyer underparts with more pronounced shaft streaks, especially on throat, longer tail. Sexes alike. Juvenile is brown above, has less pronounced streaking below. Voice. A buzzy "dzeet" call has been recorded.
Habitat. Open, low-lying country: semi-arid areas with acacia (*Acacia*) or mesquite (*Prosopis*) trees, mesquite groves, irrigated farmland, and coastal lagoons.
Food and Feeding. No information; probably similar to that of *T. albilinea*.
Breeding. Nest-building recorded in Apr, after start of rains. Solitary. One nest found, almost 2 m above ground in a tree hole, possibly made by a piculet or woodpecker (Picidae), hole led into a crevice, on floor of which were small white pebbles; laying had not yet started.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Locally common to fairly common, but with small range. A poorly known species.
Bibliography. Best *et al.* (1997), Clements & Shany (2001), Hellmayr (1935), Parker *et al.* (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Ridgely *et al.* (1998), Robbins *et al.* (1997), Schulenberg & Parker (1981), Walker (2002), Zimmer (1955a).

22. Mangrove Swallow

Tachycineta albilinea

French: Hirondelle des mangroves **Spanish**: Golondrina de Manglar
German: Mangroveschwalbe

Taxonomy. *Petrochelidon albilinea* Lawrence, 1863, New Granada = line of Panama Railroad, Panama.
This species (and, by extension, *T. stolzmanni*), along with *T. bicolor*, *T. albiventer*, *T. leucorrhoa* and *T. meyeni*, sometimes placed in separate genus *Iridoprocne*, but DNA studies indicate close relationship of these taxa with clade consisting of *T. thalassina*, *T. euchrysea* and *T. cyaneoviridis*, and support placement of all in a single genus. Forms a superspecies with *T. stolzmanni* and *T. albiventer*. Birds from NW Mexico (Sonora) sometimes separated as race *rhizophorae*, but variation not constant. Monotypic.
Distribution. W & E Mexico (S from C Sonora, SE San Luis Potosí and S Tamaulipas) S to Panama (E to E Colón and E Darién).



Descriptive notes. 11-12 cm; 10-16 g. Has white line above lores, glossy blue-green crown to back, white rump, browner tail-coverts; wings black, white tips of tertials, inner secondaries and inner greater wing-coverts in fresh plumage; tail black, shallowly forked; underparts white, sometimes faint dark shaft streaks; underwing-coverts white. Distinguished from very similar *T. stolzmanni* by distinct white line above lores, whiter underparts with fainter streaks, shorter tail. Sexes alike. Juvenile has grey-brown upperparts, grey-brown wash on underparts. Voice. Song is a soft trilling; also chirping calls "chirichrit", "chrit", "chriet" and an alarm call.
Habitat. Often found along coastal beaches and in mangroves; also inland over lowland waterbodies, such as rivers, lakes and marshes, as well as wet meadows. Typically forages over water.
Food and Feeding. Two adult stomachs contained Hymenoptera (mainly flying ants), beetles (Coleoptera), bugs (Hemiptera) and flies (Diptera). Nestling diet in Panama 26% Odonata, 26% Lepidoptera, 21% sarcophagid Diptera, 15% bees (Apidae), and a few other hymenopterans (mainly flying ants) and dipterans. Feeds alone or in pairs, typically low over water, but also up to 30 m or more. Flight direct, rapid wingbeats with some gliding. One pair had foraging area of c. 500 m². Hunts close to nest when collecting food for nestlings, sometimes over 200 m from nest when feeding self. Forages mostly in early morning and late afternoon.
Breeding. Mar/Apr-Jun/Jul in Mexico and N Central America, Jan-Jul in Panama, laying not synchronous within a population; two broods reported. Socially monogamous; moderate level of extra-pair paternity (15% of nestlings, 26% of broods). Solitary, nests 50-1300 m apart (average 313 m), and highly territorial, aggressive to intruders. Nest made of dry grass, stems, moss and leaves, lined with feathers, placed in hole in tree stump or dead tree, often partially submerged one; old woodpecker (Picidae) holes used, also other birds' nests, e.g. recorded building inside domed nest of Rusty-margined (*Myiozetetes cayanensis*) and Social Flycatchers (*M. similis*), also crevice in rocks, and occasionally artificial structure such as wall and the pilings of a wharf; nestboxes used; recorded as building near wasp nests. Clutch 3-5 eggs; incubation 17 days; hatching asynchronous, chicks fed by both sexes, average 17 times per hour, mainly early morning and late afternoon; fledging 23-27 days. In one study, nests lost to termites (Isoptera), predators and competition from *Progne chalybea*.
Movements. Apparently mainly resident; forms small flocks after breeding, sometimes hundreds near roosts. Probably some post-breeding movements, as numbers can fluctuate seasonally; in Mexico, numbers in Sonora decrease mid-summer to mid-Mar and numbers in Nayarit increase over winter.
Status and Conservation. Not globally threatened. Generally common or fairly common; rarer inland than on coast. Numbers thought to have declined in some areas, such as El Salvador, perhaps because of habitat loss or pesticide use.

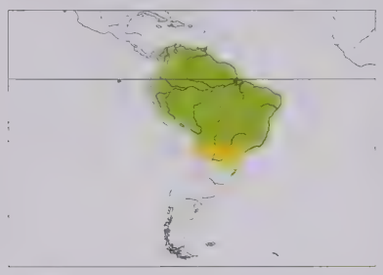
Bibliography. Anon. (1998a), Binford (1989), Blake, E.R. (1953), Blake, E.R. & Hanson (1942), Brodkorb (1943), Dyrcz (1984, 2000a), Friedmann *et al.* (1950), Griscom (1926), Hellmayr (1935), Howell & Webb (1995a), Komar & Domínguez (2001), Land (1970), Lee Jones (2004), Lowery & Dalquest (1951), Monroe (1968), Moore *et al.* (1999), Paynter (1955), Phillips (1986), Ricklefs (1971), Ridgely & Gwynne (1989), Ridgway (1904), Russell (1964), Russell & Lamm (1978), Schaldach (1963), Slud (1960, 1964, 1980), Stiles & Skutch (1989), Stotz *et al.* (1996), Thurber *et al.* (1987), Traylor (1941), Wendelken & Martin (1986), Wetmore (1943, 1957), Wetmore *et al.* (1984), Whitacre & Thorstrom (1992), Willis & Eisenmann (1979).

23. White-winged Swallow

Tachycineta albiventer

French: Hirondelle à ailes blanches **German**: Cayenneschwalbe **Spanish**: Golondrina Aliblanca

Taxonomy. *Hirundo albiventer* Boddaert, 1783, Cayenne.
This species, along with *T. bicolor*, *T. albilinea* (and, by extension, *T. stolzmanni*), *T. leucorrhoa* and *T. meyeni*, sometimes placed in separate genus *Iridoprocne*, but DNA studies indicate close relationship of these taxa with clade consisting of *T. thalassina*, *T. euchrysea* and *T. cyaneoviridis*, and support placement of all in a single genus. Forms a superspecies with *T. stolzmanni* and *T. albilinea*. Monotypic.
Distribution. N & C South America (except Pacific coast), from Colombia, Venezuela, Trinidad and the Guianas S to N Argentina, Paraguay and SE Brazil.



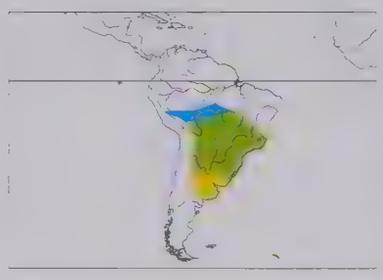
Descriptive notes. 14 cm; 14-17 g. Male has forehead to back glossy blue-green, rump white; wings black, large white wing patch formed by white edges of greater wing-coverts, tertials and secondaries; tail black, shallowly forked; underparts and underwing-coverts white. Differs from *T. albilinea* in having more white on wing, no white line above lores. Female is like male, but with less white on wing. Juvenile is browner, with less white on wing, greyer underparts. Voice. Song is a soft gurgling; also a "wrreeeet" and an alarm call.
Habitat. Open, lowland areas near water, such as mangroves, coastal beaches, rivers, lakes, reservoirs, flooded *llanos*, savanna, to 500 m. Also forages over pastures, grassy airstrips and sewage ponds.
Food and Feeding. Diet includes flies (Diptera), Hymenoptera, beetles (Coleoptera), Lepidoptera. Feeds alone, sometimes in small groups, low over water or ground; flight fast and direct. Often with *Atticora fasciata*, but keeps to the more open stretches of water.
Breeding. Apr-Aug in Trinidad, Feb-Apr in Venezuela; Sept-Apr in S. Solitary, and aggressive to intruders; sometimes in loose groups if suitable nest-sites clumped. Nest made of dry grass and rootlets, lined with feathers, usually a few metres above water in hole or crevice in cliff, rocks, tree stump, pipe, or house eaves; recorded as nesting on ferry boats in active use. Clutch 3-6 eggs, usually 4 or 5; no information on incubation and fledging periods.
Movements. Resident in N; in S a breeding visitor mid-Sept to mid-Apr, probably migrating to N of range. Vagrant in Panama.
Status and Conservation. Not globally threatened. Generally common and widespread throughout range.
Bibliography. Belton (1985), Burtt *et al.* (1988), Canevari *et al.* (1991), Chapman (1917a, 1917b), Chebez *et al.* (1999), Cherrie (1916), Contreras (1995a), Davies *et al.* (1994), ffrench (1991), Fraga & Narosky (1985), Gochfeld *et al.* (1980), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hellmayr (1935), Hilty (2003), Hilty & Brown (1986), Parker & Goerck (1997), de la Peña (1987, 1989), Pereyra (1969), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Riveros (1989), Robinson (1997), do Rosário (1996), Schmitt *et al.* (1986), Seutin (1998), Short (1975), Sick (1993), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tostain (1979), Tostain *et al.* (1992), Zimmer, J.T. (1955a), Zimmer, K.J. & Hilty (1997), Zimmer, K.J. *et al.* (1997).

24. White-rumped Swallow

Tachycineta leucorrhoa

French: Hirondelle à diadème **German**: Weißbürzelschwalbe **Spanish**: Golondrina Cejiblanca

Taxonomy. *Hirundo leucorrhoa* Vieillot, 1817, Paraguay.
This species, along with *T. bicolor*, *T. albilinea* (and, by extension, *T. stolzmanni*), *T. albiventer* and *T. meyeni*, sometimes placed in separate genus *Iridoprocne*, but DNA studies indicate close relationship of these taxa with clade consisting of *T. thalassina*, *T. euchrysea* and *T. cyaneoviridis*, and support placement of all in a single genus. Forms a superspecies with *T. meyeni*; formerly considered conspecific owing to similarities in morphology and voice, but comparison of DNA sequences supports treatment as separate species. Monotypic.
Distribution. Breeds from C & E Bolivia and C Brazil (S from C Mato Grosso, C Goiás and Espírito Santo) S to N Argentina (S to La Pampa and Buenos Aires) and Uruguay; in non-breeding season occurs N to SE Peru, N Bolivia and NC Brazil.
Descriptive notes. 13 cm; 17-21 g. Has white streak above lores, often extending over bill; crown and upperparts glossy blue (more greenish-blue when not breeding), rump white; wings black, white tips of inner secondaries, tertials and greater wing-coverts (fade with age); tail black, shallowly forked; underparts and underwing-coverts white. Distinguished from similar *T. meyeni* by white above lores. Sexes alike. Juvenile is duller and browner, with dusky breast. Voice. Song is a soft gurgling; also an alarm call.



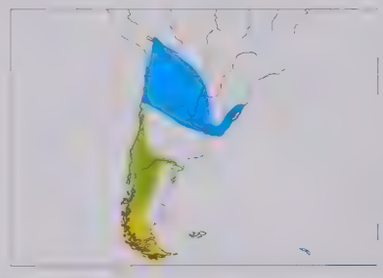
Habitat. Open and semi-open country near water, such as lagoons and marshes, woodland edge, and human habitations. Lowlands to 1000 m. Forages over water and grassland and in open woodland.
Food and Feeding. Diet includes flies (Diptera), beetles (Coleoptera), flying ants (Hymenoptera), Orthoptera and Lepidoptera. Feeds alone or in small groups, often low over water or ground; flight fast and direct. Follows humans and other animals.
Breeding. Oct-Dec in Brazil, Oct-Feb in Argentina. Solitary, and aggressive to intruders. Nest made of plant fibres, lined with hair and feathers, placed in hole or crevice in tree or dead snag, in abandoned nest of e.g. hornero (*Furnarius*) or Firewood-gatherer (*Anumbius annumbi*), hole in fence post, or in eaves, roof, thatch or pipe; often uses isolated buildings, less often buildings in towns. Clutch 4-7 eggs; incubation period 15-16 days, fledging period 21-25 days.
Movements. Migratory in S, mostly absent from Argentina and Uruguay May-Aug. Occurs all year in Brazil, but few in non-breeding season in SE. Forms flocks after breeding, sometimes of hundreds of individuals. Non-breeders occur N to SE Peru (N to Junín), N Bolivia and NC Brazil (N Mato Grasso).
Status and Conservation. Not globally threatened. Generally common or fairly common. May benefit from using artificial nest-sites, but does not often breed in towns.
Bibliography. Alabarce & Periss (1991), Aravena (1928), Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Capper *et al.* (2000), Chebez *et al.* (1999), Contreras (1995a), Daguerre (1922), Fraga & Narosky (1985), Hayes (1995), Hellmayr (1935), Klimaitis & Moschione (1987), Marelli (1919), de la Peña (1987, 1989, 1996), Pereyra (1969), Ridgely & Tudor (1989), Riveros (1989), do Rosário (1996), Rothstein (1992), Sclater & Hudson (1888), Scott & Brooke (1985), Short (1975), Sick (1993), Stotz *et al.* (1996), Wetmore (1926), Zotta (1936).

25. Chilean Swallow

Tachycineta meyeni

French: Hirondelle du Chili **German**: Chileschwalbe **Spanish**: Golondrina Chilena

Taxonomy. *Petrochelidon Meyeni* Cabanis, 1850, Santiago, Chile.
Originally described as *Hirundo leucopyga* (and specific epithet often still used), but that name invalid as preoccupied. This species, along with *T. bicolor*, *T. albilinea* (and, by extension, *T. stolzmanni*), *T. albiventer* and *T. leucorrhoa*, sometimes placed in separate genus *Iridoprocne*, but DNA studies indicate close relationship of these taxa with clade consisting of *T. thalassina*, *T. euchrysea* and *T. cyaneoviridis*, and support placement of all in a single genus. Forms a superspecies with *T. leucorrhoa*; formerly considered conspecific owing to similarities in morphology and voice, but comparison of DNA sequences supports treatment as separate species. Monotypic.
Distribution. Breeds from C Chile (S from Atacama) and SW Argentina (S from Neuquén and W Río Negro) S to Tierra del Fuego; migrates N as far as C Bolivia, Paraguay and SE Brazil (Rio Grande do Sul).



Descriptive notes. 12 cm; 15-20 g. Has forehead and face to upperparts deep blue, white rump; wings black, white tips of tertials and inner secondaries (abrade with age); tail black, slightly forked; underparts white, underwing-coverts pale grey-brown. Differs from similar *T. leucorrhoa* in lack of white supraloral streak, bluer plumage without green sheen. Sexes alike. Juvenile is duller and browner. Voice. Song is a gurgling, ending with lower-pitched guttural phrases.
Habitat. Open and semi-open country near water, such as marshes, lakes, rivers, lagoons, coastal areas, also open woodland, clearings and forest edge, scrub and human habitations, including towns.
Food and Feeding. Diet known to include flies (Diptera), beetles (Coleoptera), Hymenoptera (flying ants) and heteropteran bugs. Also recorded ingesting charred animal bones, presumably for calcium. Feeds alone or in small groups, low over ground; flight fast and direct.
Breeding. Sept-Feb in Chile, where sometimes 2-3 broods; Oct-Feb in Tierra del Fuego. Solitary, or in loose groups if suitable nest-sites clumped. Nest made of dry grass, lined with feathers, placed in tree cavity, such as old hole of woodpecker (Picidae), or in house eaves or hole in wall. Clutch 3-6 eggs; no information on incubation and fledging periods.
Movements. Resident in N. Migratory in S, moving N & E to spend non-breeding season mainly in Bolivia and Paraguay S to N Argentina and SE Brazil; possibly also S Peru. Regular passage visitor to Falklands, where bred in 1983/84. Forms flocks after breeding, sometimes with other hirundines.
Status and Conservation. Not globally threatened. Considered to be generally common or fairly common; the most abundant hirundine in Chile. Probably benefits from its frequent use of buildings as nest-sites.
Bibliography. Adams & Templeton (1979), Belton (1985), Canevari *et al.* (1991), Chebez & Bertonatti (1994), Chebez *et al.* (1999), Couve & Vidal-Ojeda (2003), Fjeldså & Krabbe (1990), Fraga & Narosky (1985), Friedmann (1927), Harris (1998), Hayes (1995), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967), Klimaitis & Moschione (1987), Maccormick (2004), Meyer de Schauensee (1966, 1982), de la Peña (1987, 1989), Ridgely & Tudor (1989), Schmitt *et al.* (1986), Schulenberg & Remsen (1982), Stotz *et al.* (1996), Vuilleumier (1985), Woods & Woods (1997), Zotta (1936, 1940).

PLATE 65 ➤



PLATE 65

inches 3

cm 8

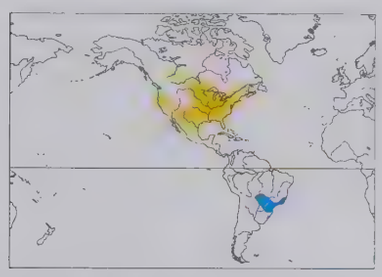
Genus *PROGNE* Boie, 1826

26. **Purple Martin**

Progne subis

French: Hirondelle noire **German**: Purpurschwalbe **Spanish**: Golondrina Purpúrea

Taxonomy. *Hirundo subis* Linnaeus, 1758, Hudson Bay, Canada.
Forms a superspecies with all congeners except *P. tapera*. Sometimes considered conspecific with *P. cryptoleuca*, *P. dominicensis* and *P. sinaloae*. Taxonomy uncertain, and subspecific status of birds in N Rockies, on Pacific coast, and in SW USA and Mexico unclear. Birds from S Arizona described as race *oberholseri*, usually considered synonymous with *hesperia*. Three subspecies generally recognized.
Subspecies and Distribution.
P. s. arboricola Behle, 1968 - mountains of W North America (probably including Pacific Northwest) E to Rocky Mts and S to NW & N Mexico (including N Baja California); winters probably in South America.
P. s. subis (Linnaeus, 1758) - E of Rocky Mts, from S Canada (C Alberta and C Saskatchewan E to SW & S Ontario, S Quebec, E New Brunswick and NW Nova Scotia) S to S USA (E from C Plains States, W Kansas and C & SW Texas) and C Mexican Highlands; winters in South America E of Andes.
P. s. hesperia Brewster, 1889 - SW USA (S Arizona lowlands) and NW Mexico (S Baja California, and lowlands S to SC Sonora, possibly along coast to N Sinaloa and on Gulf of California islands); probably winters in South America.



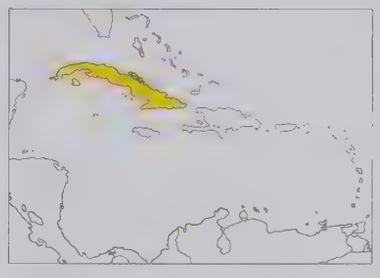
Descriptive notes. 19 cm; 48-64 g. Male is glossy steel-blue to bluish-black; concealed tufts of white feathers on side; wings and tail sooty-black, tail moderately forked. Distinguished from extremely similar *P. elegans* with difficulty, but tail slightly shorter and less deeply forked. Female nominate race is much duller, forehead and hindneck grey, throat dusky grey with fine streaks, upper breast and sides dusky brown with greyish-white feather edges, rest of underparts greyish-white with dusky streaks. Juvenile has grey-brown upperparts and throat, rest of underparts grey-white; first-year male resembles adult female but some blue feathers on head and underparts, also wing and tail shorter than adult male's; first-year female paler below and more brown above than adult. Races differ in size and in plumage of female: *arboricola* is largest, female with whitish forehead and hindcollar, much paler below than nominate; *hesperia* is smallest, plumage as previous. Voice. During courtship, males sing gurgling "croak" song, females "chortle" song; also, a "dawn song", similar to "croak" song but without terminal gratings, is sung before daylight and may attract conspecifics; other calls include "cher" and "chortle" calls used in a variety of contexts, "zwrack" and "zweet" alarm calls, a territorial "hee-hee" call, and a "choo" call used by females to lead fledged broods; call structure varies between western montane and eastern populations.
Habitat. Natural habitat is forest edge and semi-open areas with dead snags, especially near water such as ponds or marshes. Race *hesperia* inhabits saguaro (*Carnegiea gigantea*) desert; other W populations also occur in open pine (*Pinus*) forest and pine-oak (*Quercus*) forest. In E, now associated almost exclusively with human habitations, including towns and cities. Mostly up to 2600 m. Forages over open areas, such as fields, cultivation, water, marshes. Roosts in trees, and on bridges and buildings, often in towns in winter quarters.
Food and Feeding. In samples taken throughout North America, diet consisted of 23% Hymenoptera (mainly ants and wasps, a few bees), 16% flies (Diptera), 15% dragonflies and damselfies (Odonata), 15% bugs (Hemiptera), 13% beetles (Coleoptera), 9% moths and butterflies (Lepidoptera), 1% grasshoppers and crickets (Orthoptera); other prey taken include caddis flies (Trichoptera), mayflies (Ephemeroptera), termites (Isoptera) and spiders (Araneae). Known to take large cicadas (Cicadidae) and monarch butterflies (*Danaus plexippus*). In Kansas, commonest prey were beetles, aphids (Homoptera), hemipteran bugs, parasitic Hymenoptera, and craneflies (Tipulidae); more dipterans and homopterans taken early in breeding season, and hemipterans, lepidopterans and hymenopterans late in season. In Alberta, commonest prey were Odonata, syrphid flies and midges, nymphalid butterflies, hymenopterans and coleopterans. Feeds alone or in pairs, high up, to c. 50 m, sometimes 150 m. Often flies in circles, alternating flapping with gliding. Occasionally takes prey from vegetation, ground or water.
Breeding. Start of egg-laying varies, from late Mar in Florida to mid-Jun in Canada; single-brooded (rarely, two broods in S USA). Socially monogamous, with occasional polygyny (less than 5%); extra-pair paternity occurs, and related to age (in one study, up to 43% of chicks in nests of first-year males were extra-pair, only 4% in nests of older males). Solitary or in groups, depending on nest-site availability, groups mostly fewer than 35 pairs but 300 or more reported; aggressive to intruders, pair nesting in cactus defends area of 20-30 m radius around nest, and in E male defends more than one compartment in artificial "martin house". Male advertises nest-site to female with "Claiming-Reclaiming display"; extent of mate-guarding by male variable. Nest made of twigs, stems and leaves, including fresh green leaves, with variable amounts of mud forming wall next to entrance hole, most of material collected by female, but male often adds green leaves; placed in old woodpecker (Picidae) hole in dead tree or cactus, in crevice in rocks or cliff, or cavity in building, streetlamp or other artificial structures, also in artificial gourd or birdhouse (especially in E of range); sites reused in subsequent years. Clutch 4-5 eggs, usually 3-6 (rarely 2 or up to 8), smaller clutches laid by first-year females; intraspecific brood parasitism occasionally recorded (in three studies, respectively 0%, 3-6% of nesting attempts, up to 36% of young reared by first-years); incubation by female (but male will sit in her absence), attentive periods usually 4-15 minutes, incubation period 15-18 days; chicks fed by both sexes, c. 13 times per brood per hour, fledging 27-36 days, generally 28-29 days; young fed for further 5-7 days, return to nest to roost for 1-12 days. Breeding success can be poor in cold, wet weather, also affected by ectoparasites, also adult mortality sometimes high in adverse weather (e.g. cold snaps and prolonged rain); fledging success c. 50-85% of eggs laid; nest-sites usurped and nest contents destroyed by House Sparrows (*Passer domesticus*) and Common Starlings (*Sturnus vulgaris*). Recorded longevity 13 years 9 months.
Movements. Migratory; forms large post-breeding flocks, some of hundreds of thousands of birds. E population (nominate race) is a long-distance migrant to South America, where wintering area not well known but appears to be mainly E Bolivia and S & SE Brazil (S from S Mato Grosso, São Paulo, Rio de Janeiro and Espírito Santo); winter ranges of W races (*arboricola*, *hesperia*) unknown, probably also in South America; recently recorded in coastal Peru. Migrates through Mexico, Central America and N South America, but many of E population possibly fly across Gulf of Mexico. Peak autumn migration late Jul-Sept, most reaching Amazonia by mid-Nov. Returns early to breeding grounds, first arrivals from mid-Jan in Florida to early May in Canada; older males arrive first, to acquire best nest-cavities. Vagrant in e.g. Pribilof Is, Alaska, Yukon, Ontario, Prince Edward I, Newfoundland, in Pacific Ocean off Central America (Clipperton Atoll, Cocos I), in W & S Atlantic (e.g. Bermuda, Falkland Is), and in Europe (British Is).
Status and Conservation. Not globally threatened. Overall population estimated at c. 11,000,000 birds. Range has contracted in N, and population declining in N and also along Gulf coast and in S California; declines most evident since 1980. Recent increase noted along Atlantic coast, and possibly some range extension W in Great Plains, as a result of provision of martin houses; E population almost totally dependent on birdhouses. Competition from introduced House Sparrows and Common Starlings, together with clearance of dead trees in some areas, may be cause of decline since 19th century. Susceptible to periods of cold and wet weather, when large numbers, even entire populations, sometimes die; such mortality occurs regularly in N of range. In wintering range, human interference with roosts and use of pesticides may reduce numbers; large migratory roost-sites have been destroyed, or the birds harassed into leaving. Suggested conservation measures are provision and management of nestboxes and birdhouses in order to increase breeding numbers and breeding success, and protection of winter/migratory roosts.
Bibliography. Allen & Nice (1952), Anon. (1998a), Armstrong (1983), Baicich & Harrison (1997), Bent (1942), Bitterbaum (1986), Brown (1973, 1975, 1976a, 1976b, 1977a, 1977b, 1977c, 1978a, 1978b, 1978c, 1978d, 1978e, 1978f, 1978g, 1979a, 1979b, 1980, 1981a, 1981b, 1983a, 1984a, 1984b, 1997), Brown & Bitterbaum (1980), Brown & Wolfe (1978), Bunch (1964), Campbell, Dawe *et al.* (1997), Cater (1944), Chambers (1995), Contreras, A.J. (1997), Contreras, J.R. (1995a), Copley *et al.* (1999), Cyr & Larivée (1995), Davidar & Morton (1993), Davis (1998), Davis & Brown (1999), DeGraaf & Rappole (1995), DeGraaf & Rudis (1986), Dickermann *et al.* (1980), Doughty & Fergus (2002), Ehrlich *et al.* (1992), Eisenmann (1959), Eisenmann & Haverschmidt (1970), Finch, D.M. (1991), Finlay (1971a, 1971b, 1975, 1976), González *et al.* (2001), Gullion (1980), Hardy (1961), Hellmayr (1935), Hicks (1933), Hill (2002), Howell & Webb (1995a), Jackson & Schardien (1981), Jackson & Tate (1974), Johnsgard (1979), Johnston (1964, 1966, 1967), Johnston & Hardy (1962), Kale (1968), Kaufman (1996), Lee (1967, 1970, 1982), Loftin & Roberson (1983), Michael (1970), Morton, E.S. (1987, 1988), Morton, E.S. & Derrickson (1990), Morton, E.S. & Patterson (1983), Morton, E.S. *et al.* (1990), Morton, R. (1995), Moss (1972), Moss & Camin (1970), Niles (1972a, 1972b), Paynter (1995), Peck & James (1987), Peterjohn *et al.* (1995), Peterson & Chalif (1973), Price *et al.* (1995), Rappole *et al.* (1995), Richmond (1953), Rohwer & Niles (1977, 1979), Russell & Gauthreaux (1999), Sauer & Droege (1992), Sharp (1986), Sick (1993), Small (1994), Southern (1959a, 1959b, 1968), Sprunt (1944), Stokes *et al.* (1977), Stotz *et al.* (1996), Strawn (1992), Stutchbury (1991a, 1991b, 1991c, 1992), Utter & LeFebvre (1970, 1973), Wagner & Morton (1997), Wagner, Davidar *et al.* (1997), Wagner, Schug & Morton (1994, 1996a, 1996b), Walsh (1978), Wolinski (1985a), Zimmer (1955a).

27. **Cuban Martin**

Progne cryptoleuca

French: Hirondelle de Cuba **German**: Kubaschwalbe **Spanish**: Golondrina Cubana

Taxonomy. *Progne cryptoleuca* S. F. Baird, 1865, Cuba.
Forms a superspecies with all other members of genus except *P. tapera*. Has been variously considered a race of *P. subis* or of *P. dominicensis*; sometimes merged with latter and *P. sinaloae* as a single species. Monotypic.
Distribution. Breeds Cuba (including Cayo Romano) and I of Pines; non-breeding range unknown, probably in South America.



Descriptive notes. 18-19 cm. Male is glossy steel-blue, with concealed white band on lower abdomen; wings and tail sooty-black, tail forked. Differs from extremely similar *P. subis* in longer and more deeply forked tail, concealed white abdominal band. Female is duller, more sooty-brown with blue feather margins above, greenish-blue gloss on wings and tail, sooty-grey from side of head to breast, sides and underwing-coverts, rest of underparts white, dark shafts on breast, sides and undertail-coverts; resembles female *P. chalybea*, but duskier throat, breast and sides, whiter abdomen. Juvenile is much duller: first-year male resembles adult female, but often some blue feathers below. Voice. Song is a gurgling, including a high-pitched "twick-twick"; also a strong melodious warble.
Habitat. Semi-open areas, especially near water and along coast, such as scrub, farmland, mangroves; also human habitations.
Food and Feeding. Diet includes beetles (Coleoptera), heteropteran bugs, and Odonata. Flight alternately flapping and gliding.
Breeding. Apr-Aug. In loose colonies, sometimes solitary. Nest of vegetable fibres, e.g. grass, twigs and leaves, placed in natural tree hole or old hole of woodpecker (Picidae), cavity in rock, or artificial site such as pipe, or cavity in building. Clutch 3-5 eggs; incubation and fledging periods not documented.
Movements. Absent from breeding areas mid-Oct to Jan, most having left by Sept. Non-breeding range not known, presumably in South America; recorded as a migrant in Jamaica and Curaçao. Accidental in SE USA (S Florida).
Status and Conservation. Not globally threatened. Common throughout most of breeding range. Research required in order to establish whereabouts of non-breeding quarters.
Bibliography. Anon. (1998a), Arendt (1992), Balat & González (1982), Banks (2000), Barbour (1943), Bent (1942), Bond (1971), Bradley (2000), Chapman (1888), Danforth (1935b), Faaborg (1985), Garrido (1988), Garrido & Kirkconnell (2000), Gundlach (1873), Hellmayr (1935), Hill (2002), Kaufman (1996), Meyer de Schauensee (1966,

On following pages: 28. Caribbean Martin (*Progne dominicensis*); 29. Sinaloa Martin (*Progne sinaloae*); 30. Grey-breasted Martin (*Progne chalybea*); 31. Galapagos Martin (*Progne modesta*); 32. Peruvian Martin (*Progne murphyi*); 33. Southern Martin (*Progne elegans*); 34. Brown-chested Martin (*Progne tapera*).

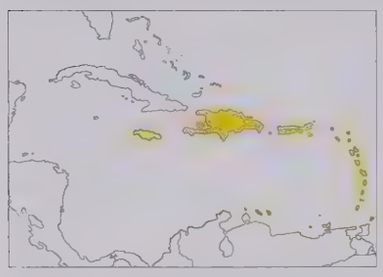
1982), Phillips (1986), Raffaele *et al.* (1998, 2003), Read (1909, 1911a, 1911b, 1912, 1914), Ridgely & Tudor (1989), Ridgway (1904), Stotz *et al.* (1996), Terres (1982).

28. Caribbean Martin

Progne dominicensis

French: Hirondelle à ventre blanc **Spanish**: Golondrina Caribeña
German: Dominikanerschwalbe
Other common names: Snowy-bellied/White-bellied Martin

Taxonomy. *Hirundo dominicensis* J. F. Gmelin, 1789, Hispaniola.
Forms a superspecies with all congeners apart from *P. tapera*. Sometimes considered a race of *P. subis*; sometimes merged with *P. cryptoleuca* and *P. sinaloae* as a single species. Monotypic.
Distribution. Breeds Greater Antilles (except Cuba and I of Pines), Lesser Antilles and Tobago; non-breeding range uncertain, probably in South America.



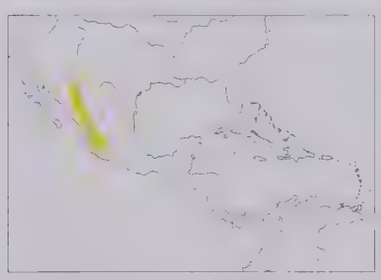
Descriptive notes. 18-19 cm; 38-42 g. Male is mostly glossy steel-blue; wings and tail black, tail moderately forked; lower breast, abdomen and undertail-coverts white, underwing-coverts with dark spots; underwing-coverts grey-brown. Distinguished from *P. sinaloae* by dark sides and flanks, creating narrower area of white on abdomen. Female is duller, more grey-brown, with pale on throat; differs from female *P. chalybea* in brown coloration extending more on to flanks, from *P. sinaloae* in more extensively pale throat, from *P. cryptoleuca* in darker upper breast. Juvenile is much duller than adult; first-year male resembles adult female, but faint blue gloss on upperparts. Voice. Song is a gurgling; calls include contact calls "zwoot" and "kweet", a "croot" uttered during courtship, a "wheet" used when a bird is alarmed, a "peak" alarm call and a "wrack" used during mobbing of predators.
Habitat. Semi-open areas, especially near water and along coast, such as second-growth scrub and farmland; also human habitations.
Food and Feeding. Twelve stomachs contained 33% Hymenoptera (mainly wasps), 24% pentatomid bugs, 26% flies (Diptera), 8% beetles (Coleoptera), 8% Odonata; five others contained pentatomid bugs, syrphid flies, Hymenoptera, beetles, hemipteran bugs and dragonflies. Also recorded as feeding on termites (Isoptera). Forages alone or in small groups, both high up and low over ground. Alternates gliding with flapping flight. Follows cattle.
Breeding. Generally Mar-Jul; single-brooded. Solitary or in loose groups, up to 30 pairs at one site. Nest of fibres, such as grass, twigs, leaves, paper and silk, placed in hole in cliff, cave, tree, chimney, pipe, belfry or building. Clutch 4-6 eggs, 2 on Tobago; no information on incubation and fledging periods.
Movements. Migratory, almost completely absent from West Indies Nov-Dec. Non-breeding range unknown, likely to be in South America. Regular summer breeder and passage migrant on Barbados, where generally uncommon in Oct, rarely seen in Nov, and recorded three times in Dec and twice in Jan; in 2000, however, 156 individuals located at roost on the island in Nov, and varying numbers throughout winter (29-45 in Dec, 15-22 in Jan, 30 in Feb, 40-80 in Mar), the first known occurrence of overwintering on any West Indian island. First records from Trinidad as recently as 1999 to 2001, all in spring (Feb-May), thus little evidence of regular passage through the island from farther N. Recorded also in Bahamas and Cayman Is, and on Cozumel I (off NE Yucatán Peninsula); several reports from Venezuela require confirmation.
Status and Conservation. Not globally threatened. Common and widespread in West Indies. Probably benefits from its frequent use of artificial nest-sites.
Bibliography. Anon. (1998a), Arendt (1992), Biaggi (1983), Blake, E.R. (1953), Bond (1928a, 1928b, 1943, 1971, 1985), Bradley (2000), Bryant (1867b), Buden (1987a), Burtt *et al.* (1988), Danforth (1929, 1935a), Davis & Miller (1962), Dobson (2002), Downer (1986, 1987), Faaborg (1985), ffrench (1991), Frost & Massiah (2001), Gochfeld (1965), Hellmayr (1935), Herklots (1961), Hill (2002), Keith (1997), Keith *et al.* (2003), Meyer de Schauensee (1966, 1982), Murphy & Hayes (2001), Phillips (1986), Pinchon (1976), Raffaele (1989), Raffaele *et al.* (1998), Ridgely & Tudor (1989), Ridgway (1904), Salmon (1975, 1991), Schönwetter (1979), Sheldon (1998), Stotz *et al.* (1996), Voous (1983), Wetmore (1916), Wetmore & Swales (1931).

29. Sinaloa Martin

Progne sinaloae

French: Hirondelle du Sinaloa **German**: Sinaloaschwalbe **Spanish**: Golondrina Sinaloense
Other common names: White-bellied Martin

Taxonomy. *Progne sinaloae* Nelson, 1898, Plomosas, Sinaloa, Mexico.
Forms a superspecies with others of genus apart from *P. tapera*. Variously considered to be a race of *P. subis* or of *P. dominicensis*; sometimes merged with latter and *P. cryptoleuca* as a single species. Has been known to hybridize with *P. chalybea*. Monotypic.
Distribution. Breeds W Mexico (NE Sonora S to Jalisco and Michoacán); non-breeding range uncertain, probably in South America.



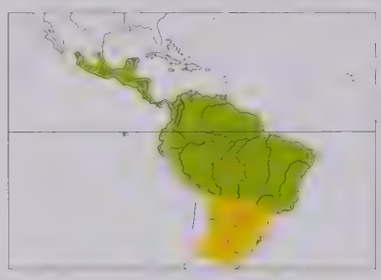
Descriptive notes. 17-18 cm. Male is mostly glossy steel-blue; wings and tail blacker, tail forked; lower breast, abdomen and undertail-coverts white, indistinct dark shaft streaks on undertail-coverts. Differs from *P. chalybea* in greater contrast between dark and white areas below. Female is generally duller, upperparts sometimes mottled grey-brown, face, throat, breast and flanks dusky brown, pale median area of throat contrasting with darker breast, whitish abdomen and undertail-coverts. Juvenile undescribed; first-year male resembles adult female, but blue feathers on upperparts and some on breast. Voice. Calls not described; probably similar to those of congeners.
Habitat. Pine (*Pinus*) forest and mixed forest of pine and oak (*Quercus*), also semi-open woodland; to 2000 m. Possibly separated altitudinally from *P. subis* where the two overlap in range.
Food and Feeding. No information on diet; probably similar to that of congeners. Flight alternately gliding and flapping.
Breeding. Poorly known. Present on breeding grounds Mar-Aug. Seen in small groups. Nest in hole, probably mainly in trees. No information on clutch size and incubation and fledging periods.
Movements. Migratory. Migrants recorded on Pacific coast of Mexico and in Guatemala; non-breeding quarters unknown, probably in South America.
Status and Conservation. Not globally threatened. Data-deficient. Uncommon to fairly common, and local. Known from only nine sites on W slope of Sierra Madre Occidental, in states of Sonora, Jalisco and Michoacán. Of concern because of its small range and the fact that very little is known about its ecology and biology.
Bibliography. Anon. (1998a), Blake, E.R. (1953), Bond (1971), Ceballos & Valdelamar (2000), Davis & Miller (1962), Friedmann *et al.* (1957), Hellmayr (1935), Hill (2002), Holt (1926), Howell, S.N.G. & Webb (1995a), Howell, T.R. (1972), Lee Jones (2004), Phillips (1986), Ridgely & Gwynne (1989), Ridgway (1904), Stattersfield & Capper (2000), Stotz *et al.* (1996).

30. Grey-breasted Martin

Progne chalybea

French: Hirondelle chalybée **German**: Graubrustschwalbe **Spanish**: Golondrina Pechigrís
Other common names: White-bellied Martin

Taxonomy. *Hirundo chalybea* J. F. Gmelin, 1789, Cayenne.
Forms a superspecies with others of genus apart from *P. tapera*. Hybrids with *P. sinaloae* and *P. elegans* recorded. Race *warneri* often merged with nominate. Race *macrorhamphus* formerly known as *domestica*, but latter name invalid, as preoccupied. Three subspecies recognized.
Subspecies and Distribution.
P. c. warneri A. R. Phillips, 1986 - W Mexico (S from S Sinaloa).
P. c. chalybea (J. F. Gmelin, 1789) - E Mexico (from S Tamaulipas) S through Central America to Trinidad and N South America (S to NW Peru and, E of Andes, to N Bolivia, N Argentina and C & NE Brazil).
P. c. macrorhamphus Brooke, 1974 - C Bolivia and E Brazil S to N Argentina (S to Mendoza, Córdoba and Buenos Aires) and Uruguay; migrates to N South America.



Descriptive notes. 16-18 cm; 33-50 g. Male nominate race has forehead to crown and upperparts glossy steel-blue; wings and tail black, tail moderately forked; chin, throat, breast and sides grey-brown, breast occasionally blue-black, abdomen and undertail-coverts white with some fine dusky shaft streaks; underwing-coverts sooty-grey. Distinguished from *P. sinaloae* by less contrast between dark and white areas below. Female is duller, with mottled upperparts, paler throat; differs from female *P. subis* in whiter underparts, browner forehead, from female *P. dominicensis* in brown extending less on to flanks. Juvenile is much duller than male, paler throat and underparts less contrasting; first-year male resembles adult female. Race *warneri* has pale forehead; *macrorhamphus* is larger, with paler throat and breast. Voice. Song is a gurgling; calls include a contact call "cheur", a rattle heard between mates, a staccato "cree" used during courtship and submissive contexts, an aggressive "zwat", a "zurr" used during fights and as an alarm call, a "krack" used during mobbing of predators, and a "cluck" in territorial contexts.
Habitat. Lowland woodland, savanna, forest clearings, coastal mangroves, farmland, also human habitations, including towns; often near water, such as swamps and rivers. Up to c. 1500 m in Mexico, to c. 2000 m in Ecuador. Forages over open country such as grassland, clearings and water, and around trees.
Food and Feeding. Adult diet in Venezuela c. 50% Hymenoptera (mainly winged ants), 10% each of Odonata, butterflies and moths (Lepidoptera) and termites (Isoptera). Other prey include flies (Diptera), beetles (Coleoptera), other hymenopterans (bees, wasps and parasitic wasps), bugs (both Heteroptera and Homoptera), lacewings (Neuroptera), and grasshoppers and crickets (Orthoptera). Odonata and lepidopterans most important food of nestlings. Feeds alone or in small groups. Flies high up, gliding for much of the time, or alternating gliding with rapid flight. Occasionally feeds on the ground.
Breeding. Mainly Feb-Aug in Mexico; Mar/Apr-Jun/Jul in Central America and N South America, Sept-Dec in S. Solitary or in loose groups; aggressive towards intruders. Male attracts females with "Claiming-Reclaiming display". Nest made of dry grass, twigs, straw or similar fibrous material, even string and cloth, placed in hole in tree, cliff or termite nest, under pier or jetty, in pipe, or frequently in roof or under eaves of building, and birdhouses also used; reported as using mud and straw to reduce size of entrance hole if too large; brings green leaves to nest. Clutch 2-5 eggs; incubation by female, 15-18 days; chicks fed by both sexes, fledging 25-28 days, once only 22 days; young remain near nest for a few days, fed by parents for a week or more.
Movements. Forms large post-breeding flocks and roosts, sometimes thousands of birds, and sometimes with other martins. In N of range may make short post-breeding movements, e.g. away from Atlantic coast; also partially migratory, with non-breeding range extending from Pacific slope of Mexico (S from Nayarit) and Belize S to N Bolivia and C Brazil. Migratory in S of range, where absent mainly Apr-Aug, moving N to as far as S Venezuela, Amazonian Brazil and Surinam. Casual visitor N to S USA (Texas) and Tobago.
Status and Conservation. Not globally threatened. Fairly common to common and widespread in suitable habitat. Often abundant around villages and towns, as readily nests in artificial sites; also roosts in cities, in groups of thousands. Local declines recorded in past, attributed to competition for nest-sites from introduced House Sparrows (*Passer domesticus*).
Bibliography. Anon. (1998a), de Azevedo *et al.* (2000), Belton (1985), Binford (1989), Bitterbaum (1986), Bloch *et al.* (1991), Bond (1971), Canevari *et al.* (1991), Contreras, A.J. (1997), Contreras, J.R. (1995a), Daguerre (1922), Davies *et al.* (1994), Davis (1953), DeGraaf & Rappole (1995), Dickerman & Parkes (1997), Dyrez (1984), Eisenmann (1959), Eisenmann & Haverschmidt (1970), ffrench (1991), Fraga & Narosky (1985), Griscom (1935), Guzmán (1998), Hallinan (1924), Hartley (1917), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hellmayr (1935), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995a), Kaufman (1996), Komar & Domínguez (2001), Marchant (1958), Mees (1985), Meyer de Schauensee & Phelps (1978), Mitchell (1957), Monroe (1968), Moojen *et al.* (1941), Parker & Goerck (1997), de la Peña (1987, 1989), Peterson & Chalif (1973), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Rodrigues *et al.* (1997), do Rosário (1996), Russell (1964), Salaman (1994), Sclater & Hudson (1888), Sheldon & Winkler (1993), Short (1975), Sick (1993), Skutch (1985), Slud (1964), Stiles & Skutch (1989), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et*

al. (1997), Tostain *et al.* (1992), Watt & Mock (1987), Wetmore *et al.* (1984), Wiedenfeld *et al.* (1985), Willis (1980), Willis & Eisenmann (1979), Zimmer, J.T. (1955a), Zimmer, K.J. & Hilty (1997), Zimmer, K.J. *et al.* (1997), Zotta (1936).

31. Galapagos Martin

Progne modesta

French: Hirondelle sombre **German**: Galapagosschwalbe **Spanish**: Golondrina de Galápagos

Taxonomy. *Progne Modesta* Gould, 1839, San Salvador (James) Island, Galapagos Archipelago.
Forms a superspecies with others of genus apart from *P. tapera*. This species and *P. murphyi* and *P. elegans* often treated as conspecific. Species initially named *Hirundo concolor*, but this name is invalid, as preoccupied. Monotypic.
Distribution. Galapagos Is: present on all islands except Wenman (Wolf), Culpepper (Darwin), Marchena (Bindloe), Pinta (Abingdon), Rábida (Jervis) and Genovesa (Tower).



Descriptive notes. 15 cm. Male is dark steel-blue, wings and tail blacker, tail slightly forked. Female has duller upperparts, uniformly dusky brown underparts. Juvenile resembles adult female. Voice. Short, warbling song; twittering flight call "che-cher" or "tchur-tchur", and high-pitched alarm call.
Habitat. Coastal lagoons, forests, and mountains; to 970 m.
Food and Feeding. Diet is known to include butterflies and moths (Lepidoptera). Sometimes feeds low over ground and around houses.
Breeding. Recorded in Mar. Nest made of grass stems and twigs, with a few feathers, in hole in cliff or tree. Clutch 2-3 eggs; no further information available.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common, with small numbers on C & S islands of Galapagos; most common on Isabela (Albemarle).
Bibliography. Beebe (1924a), Best *et al.* (1997), Castro & Phillips (1996), Eisenmann & Haverschmidt (1970), Gifford (1919), Harris (1973, 1982), Heinzel & Hall (2000), Hellmayr (1935), Meyer de Schauensee (1966, 1982), Ridgely & Tudor (1989), Ridgway (1904), Stotz *et al.* (1996), Swarth (1931), Swash & Still (2000).

32. Peruvian Martin

Progne murphyi

French: Hirondelle de Murphy **German**: Peruschwalbe **Spanish**: Golondrina Peruana
Other common names: Chilean Martin

Taxonomy. *Progne murphyi* Chapman, 1925, near Talara, coast of north-west Peru.
Forms a superspecies with others of genus apart from *P. tapera*. Sometimes treated as a race of *P. modesta*. Monotypic.
Distribution. Coastal W Peru and extreme N Chile (Arica).



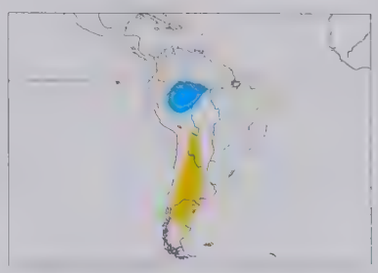
Descriptive notes. 17 cm. Male is dark steel-blue, wings and tail blacker, tail slightly forked; sometimes suggestion of white patch on sides. Distinguished from extremely similar *P. subis* by somewhat longer tail. Female is duller, grey above with steel-blue band across mid-back, dusky centres of crown and hindneck feathers, paler and more uniform underparts, grey-white undertail-coverts. Juvenile resembles adult female. Voice. Not recorded; probably similar to congeners.
Habitat. Open and semi-open areas, including coastal cliffs, grassland, woodland, farmland and human habitations. Mainly along coast but sometimes inland, to 1800 m.
Food and Feeding. Details of diet not documented; probably similar to that of congeners. Frequently glides; flight often slow.
Breeding. Poorly known. Nest in hole in cliff, tree or building. No other information.
Movements. Possibly local post-breeding movements, as numbers in S Peru increase in Jan-Apr.
Status and Conservation. Not globally threatened. Uncommon within small range. Poorly known species; research required in order to determine its ecology and biology.
Bibliography. Clements & Shany (2001), Fjeldså & Krabbe (1990), Hellmayr (1935), Jaramillo (2003), Johnson (1967, 1972), Koepcke (1970), Marín (2004), Meyer de Schauensee (1966, 1982), Mussa & Tala (1996), Ridgely & Tudor (1989), Stotz *et al.* (1996), Zimmer (1955a).

33. Southern Martin

Progne elegans

French: Hirondelle gracieuse **German**: Blauschwalbe **Spanish**: Golondrina Sureña
Other common names: Elegant Martin

Taxonomy. *Progne elegans* S. F. Baird, 1865, Río Bermejo, Argentina.
Forms a superspecies with others of genus apart from *P. tapera*. Sometimes treated as race of *P. modesta*. Hybrids with *P. chalybea* recorded in NW Argentina. Monotypic.
Distribution. Breeds in S Bolivia (S from C Cochabamba and W Santa Cruz) and much of Argentina (generally S to Chubut); migrates N to W Amazonia.
Descriptive notes. 17 cm. Male is dark glossy steel-blue, wings and tail blacker, tail deeply forked. Differs from extremely similar *P. subis* in slightly longer and more deeply forked tail (probably indistinguishable in the field). Female has duller upperparts and dusky brown underparts, feathers extensively pale-margined, appearing scaly, undertail-coverts white with dusky shafts. Juvenile resembles adult female. Voice. Song is a short gurgle; also makes a harsh contact call and an alarm call.



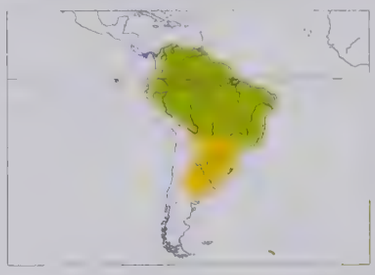
Habitat. Open and semi-open areas, including grassland, woodland, scrub, forest and human habitations; mainly lowlands, but up to 2600 m.
Food and Feeding. Diet known to include Lepidoptera, Odonata and Hymenoptera. Feeds alone or in small groups, both high up and low over ground. Frequently glides; flight often slow.
Breeding. Probably Oct-Feb/Mar. Nest of grass stems and twigs, with a few feathers, placed in hole in cliff, tree or wall or in roof of house; holes made by other species in riverbanks used in Argentina. Clutch 3-5 eggs; no information on incubation and fledging periods.
Movements. Migratory, absent from breeding range mainly Apr-Oct. Forms large post-breeding flocks; appears to spend austral winter mostly in W Amazonia (SE Colombia, NE Peru, W Brazil), but possibly also as far N as E Panama; some may winter in N Argentina, and recorded also in Uruguay. Mixes with *P. chalybea* in winter. Accidental in S USA (S Florida) and Falkland Is.
Status and Conservation. Not globally threatened. Fairly common, especially around towns and cultivated areas.
Bibliography. Anon. (1998a), Babarskas *et al.* (1995), Canaday (2002d), Canevari *et al.* (1991), Chebez *et al.* (1999), Contreras (1995a), Couve & Vidal-Ojeda (2003), Cuello (1985), Eisenmann (1959), Eisenmann & Haverschmidt (1970), Fjeldså & Krabbe (1990), Fraga & Narosky (1985), Guerra (1969), Harris (1998), Hellmayr (1935), Imberti (2003), Johnson (1967), Kaufman (1996), Mazar Barnett & Pearman (2001), Meyer de Schauensee (1966, 1982), Narosky & Di Giacomo (1993), Narosky & Yzurieta (1993), Nellar (1993), Nores *et al.* (1983), de la Peña (1987, 1989), Pereyra (1969), Phillips (1986), Ridgely & Tudor (1989), Sclater & Hudson (1888), Short (1975), Stotz *et al.* (1996), Wetmore (1926), Woods (1988).

34. Brown-chested Martin

Progne tapera

French: Hirondelle tapère **German**: Braunbrustschwalbe **Spanish**: Golondrina Parda

Taxonomy. *Hirundo Tapera* Linnaeus, 1766, America = eastern Brazil (possibly Pernambuco).
Has been placed in a separate genus *Phaeoprogne* because of lack of blue in plumage, similarity of sexes, slender bill, weaker feet, less deeply forked tail and greater feathering on tarsus; DNA-DNA hybridization and cytochrome *b* data, however, indicate close relationship with present genus. Two subspecies recognized.
Subspecies and Distribution.
P. t. tapera (Linnaeus, 1766) - N South America from Caribbean coast and Trinidad S, E of Andes, to Amazonian & NE Brazil, also W of Andes in SW Ecuador (S from Guayas) and NW Peru (Tumbes).
P. t. fusca (Vieillot, 1817) - breeds SE Bolivia and S & E Brazil S to C Argentina (Mendoza, La Pampa, Buenos Aires) and Uruguay; migrates N to N South America and Panama.



Descriptive notes. 16 cm; 30-40 g. Nominate race has crown and upperparts sandy brown, wings and tail darker brown, tail slightly forked; chin, throat and abdomen white, indistinct brown breastband; undertail-coverts long and white. Distinguished from *Riparia riparia* by much larger size. Sexes alike. Juvenile has side of throat more grey-brown, squarer tail. Race *fusca* is larger, darker, has more distinct breastband, dusky marks on lower breast and abdomen. Voice. Song is harsh and guttural with series of gurgling sounds; contact call "chu-chu-chip".
Habitat. Open or semi-open areas with trees, often near water, also human habitations, including towns. Forages over grassland, clearings, rivers and cultivation. Up to c. 1600 m; migrant *fusca* up to 4000 m.
Food and Feeding. Diet includes flies (Diptera), beetles (Coleoptera), bees, wasps and ants (Hymenoptera), termites (Isoptera), bugs (Hemiptera), dragonflies (Odonata), butterflies and moths (Lepidoptera); in Venezuela, nestlings fed mainly with dipterans, hymenopterans and small lepidopterans, with some termites and bugs, but given more large dragonflies as they grew. Feeds alone or in small groups. Flies fast and low over vegetation or water, also slowly around trees or open ground; also high up when feeding on swarming termites and ants.
Breeding. Apr-Jun in Venezuela, Mar-May in Colombia; Nov-Mar in S. Solitary or in small loose groups (of eight bridges along one road, five had only one nest, two had three and one had four); aggressive towards intruders. Nest made from dry grass, lined with feathers, placed in hole in termite nest, earth bank, tree, bridge or building; old nests of Rufous Hornero (*Furnarius rufus*) often used in S (race *fusca*). Clutch 3-5 eggs, usually 4; incubation by female, bouts 2-25 minutes in dry weather, up to 54 minutes in wet, period 14-15 days; nestlings fed by both sexes, fledging c. 28 days; young stay near nest for several days. In one study, 6 of 10 clutches lost to predators or flooding, and 10 of 14 nestlings fledged.
Movements. Nominate race resident. S race (*fusca*) migratory; forms large post-breeding flocks of hundreds or thousands of birds, sometimes with other hirundines. S populations move N to N South America and as far as Panama, where present from Mar to Oct/Nov; also recorded in Costa Rica. Vagrant in USA (Massachusetts, New Jersey, Florida).
Status and Conservation. Not globally threatened. Generally common; uncommon in Ecuador. In S of range, may be limited by availability of hornero nests. Large flocks roosting on buildings are sometimes considered a nuisance by local human inhabitants.
Bibliography. Anon. (1998a), Belton (1985), Bloch *et al.* (1991), Canevari *et al.* (1991), Chapman (1929b), Chebez *et al.* (1999), Contreras (1995a), Evans, D.J. (1999), Ferreira de Vasconcelos *et al.* (2003), Fjeldså & Krabbe (1986, 1990), Fraga (1979), Fraga & Narosky (1985), Friedmann (1927), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hellmayr (1935), Hilty (2003), Hilty & Brown (1986), Klimaitis & Moschione (1987), Mitchell (1957), Mooijen *et al.* (1941), Parker & Goerck (1997), de la Peña (1987, 1989), Pereyra (1969), Petersen *et al.* (1986), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Robinson (1997), do Rosário (1996), Sclater & Hudson (1888), Sheldon & Winkler (1993), Short (1975), Sick (1993), Stiles & Skutch (1989), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tostain *et al.* (1992), Turner (1984), Wetmore *et al.* (1984), Willis (1980), Willis & Eisenmann (1979), Zimmer, J.T. (1955a), Zimmer, K.J. & Hilty (1997), Zimmer, K.J. *et al.* (1997).


inches 3
cm 8
PLATE 66
♂
ssp murina
♂ ♀
ssp meridensis
35
ssp cyanoleuca
ssp patagonica
36
ssp peruviana
♂
ssp cyanodorsalis
37
38
39
ssp griseiventris
40
41
ssp tibialis
42
ssp minima
ssp ruficollis
ssp uropygialis
ssp serripennis
ssp stuarti
44
43
ssp ridgwayi
ssp burleighi
ssp aequalis
45

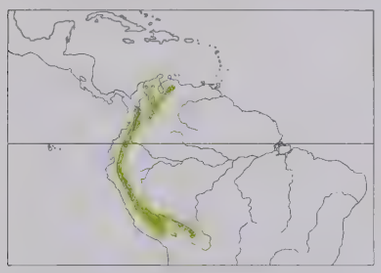
Genus *NOTIOCHELIDON* S. F. Baird, 1865

35. Brown-bellied Swallow

Notiochelidon murina

French: Hirondelle à ventre brun **German**: Mausschwalbe **Spanish**: Golondrina Ventriparda

Taxonomy. *Petrochelidon murina* Cassin, 1853, Ecuador.
Has been placed in genus *Atticora* or in a separate genus *Orochelidon*. Three subspecies recognized.
Subspecies and Distribution.
N. m. meridensis (J. T. Zimmer & Phelps, Sr, 1947) - W Venezuela.
N. m. murina (Cassin, 1853) - Andes in Colombia, Ecuador and Peru.
N. m. cyanodorsalis (Carriker, 1935) - S Peru and C Bolivia.



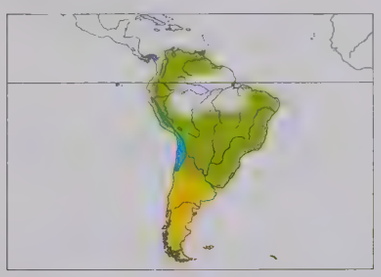
Descriptive notes. 14 cm; 12-5 g. Male nominate race has crown and upperparts blackish with blue-green gloss; wings and tail dark brown, tail moderately forked; underparts sooty grey-brown, black undertail-coverts; underwing-coverts grey-brown. Differs from *N. cyanoleuca* in size and overall dark appearance, from *Haplochelidon andecola* in darker belly and more forked tail. Female is duller. Juvenile is duller than adult, has brown throat, grey-white underparts, shorter tail. Race *meridensis* has bluer upperparts than nominate, with undertail-coverts tipped metallic dark blue in male, brown in female; *cyanodorsalis* has steel-blue gloss on upperparts, undertail-coverts black. Voice. Song is a weak buzzing; also a contact call "tjrip tjirp-tjrip-tjirp", and an alarm call.
Habitat. Open highland country, such as grassland, shrub, elfin forest, *Polylepis* woodland, cultivation, also human habitations; often near water. At 1800-4000 m, mostly above 2500 m.
Food and Feeding. Feeds on aerial insects. Forages alone, in pairs, or in small groups; sometimes with *N. cyanoleuca*, less often with *N. flavipes*. Flight fast and direct, often low over ground, at times high and often in wide circles.
Breeding. Nest-building and/or eggs recorded in Sept-Oct in Colombia and Ecuador; also, individuals in breeding condition in Jan-Aug in WC Andes, and juveniles in Jun-Aug. Solitary or in small loose groups. Nest of dry grass or moss, lined with feathers, placed in hole in cliff, cave or road cutting, in eaves of building, or on beam under bridge. Clutch 2-3 eggs; incubation and fledging periods not documented.
Movements. Probably resident; possibly some local or seasonal movements, e.g. in Venezuela.
Status and Conservation. Not globally threatened. Common or fairly common. Not well known. Present in several protected areas, e.g. Podocarpus National Park (Ecuador).
Bibliography. Best *et al.* (1997), Bloch *et al.* (1991), Chapman (1917a, 1917b, 1917c), Fjeldså & Krabbe (1990), Hellmayr (1935), Hilty (2003), Hilty & Brown (1986), Johnson (1972), Kiff *et al.* (1989), Remsen (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Ridgely *et al.* (1998), Salaman (1994), Stotz *et al.* (1996), Varty *et al.* (1986), Zimmer (1930, 1955a).

36. Blue-and-white Swallow

Notiochelidon cyanoleuca

French: Hirondelle bleu et blanc **Spanish**: Golondrina Barranquera
German: Schwarzsteißschwalbe
Other common names: Patagonian Swallow (*patagonica*)

Taxonomy. *Hirundo cyanoleuca* Vieillot, 1817, Paraguay.
Sometimes placed in genus *Atticora* or, more usually, in *Pygochelidon*. DNA studies on this species suggest that present genus, although close to former and to *Neochelidon*, is distinct. Three subspecies recognized.
Subspecies and Distribution.
N. c. cyanoleuca (Vieillot, 1817) - E Costa Rica and Panama (highlands), Colombia, Venezuela, Trinidad, the Guianas, and from Ecuador, N & E Peru and C & NE Brazil S to NW Argentina (Tucumán), Paraguay and Uruguay.
N. c. peruviana (Chapman, 1922) - coastal Peru.
N. c. patagonica (d'Orbigny & Lafresnaye, 1837) - breeds from C Chile and C Argentina S to Tierra del Fuego; in non-breeding season N South America (S to N Chile and N Argentina) and S Central America.



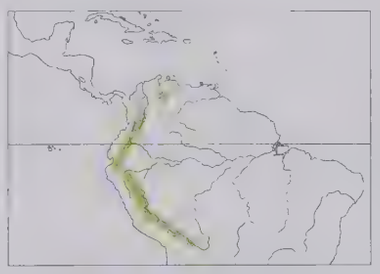
Descriptive notes. 12-13 cm; 9-15 g. Has crown and upperparts glossy steel-blue; wings and tail blackish, tail slightly forked; white below, grey wash on sides; undertail-coverts black with blue margins; underwing-coverts sooty-grey. Distinguished from similar *N. flavipes* by white throat and pale sides, larger size. Sexes alike. Juvenile is duller and browner, with pale feather tips on rump, buffy throat, shorter tail. Race *peruviana* is smaller than nominate, with darker sides; *patagonica* is larger than previous, with sides and underwing-coverts paler, and much more white in undertail-coverts. Voice. Song is a series of weak buzzing and squeaking notes; also a contact call "tseet" and an alarm call.
Habitat. Occurs in open and semi-open country, in forest clearings, and around cultivation and human habitations, including large towns. Mostly at middle elevations, to c. 3500 m; in lowlands mainly when not breeding.
Food and Feeding. In Venezuela, adult diet 71% Hymenoptera (mainly flying ants, parasitic wasps), as well as flies (Diptera), beetles (Coleoptera), homopteran bugs and moths (Lepidoptera); nestling diet 27% small dipterans, 22% flying ants, 11% beetles, 15% mayflies (Ephemeroptera), and small numbers of homopterans, moths, parasitic hymenopterans and termites (Isoptera). Diet in Trinidad also includes dipterans, hymenopterans, bugs and beetles. Forages alone or in small, loose groups, mainly at 3-15 m but up to c. 25 m, over open ground and around trees and animals; in poor weather feeds more over water. Sometimes together with *N. murina*, occasionally with *N. flavipes*; also seen to forage with *Haplochelidon andecola*. Flight fast and zigzagging, or more leisurely in circles; about a quarter of flying time spent in gliding.
Breeding. Mostly Jan-Jun/Jul in N, before main rainy season, with peaks in Feb-Apr, Jun-early Aug and Sept-Dec in SE Colombia; mainly Oct-Feb in S of range, but Sept-Dec in Chile and Sept-Mar in Bolivia; one or two broods, usually one at high altitudes. Pair-members may stay together throughout year in N. Solitary or in loose groups; territorial, and aggressive towards intruders. Nest built by both sexes, taking 1 week to 1 month, made of dry grass and feathers, placed in vacant burrow or in hole in tree, bank, ditch, road cutting, rocks, cliff, bridge, building, well or lamppost; holes made by Common Miner (*Geositta cunicularia*) in viscacha (*Lagostomus*) burrows often used in S of range. Clutch 2-4 eggs in N, 3-6 in S; incubation by both sexes, period c. 15 days; both also feed nestlings, average of 3 visits per hour per nestling, fledging period 26-27 days; fledglings fed by parents near nest for several days.
Movements. Resident in N, migratory in S. Forms large post-breeding flocks of tens or hundreds. Race *patagonica* migrates N, departure from breeding grounds Jan-Mar; in non-breeding season present from Panama, and casually from farther N (to Chiapas, in S Mexico), S to N Chile and N Argentina; main return to breeding grounds in Aug-Sept. Elevational shifts in N, e.g. in Venezuela.
Status and Conservation. Not globally threatened. Widespread and common; sometimes very abundant, especially in highlands and in S of range. A common hirundine in towns and cultivated areas. Readily takes advantage of artificial nest-sites; has probably benefited from urban expansion.
Bibliography. Anon. (1998a), Arnold *et al.* (1983), Bloch *et al.* (1991), Canevari *et al.* (1991), Chebez & Bertonatti (1994), Chebez *et al.* (1999), Contreras (1995a), Couve & Vidal-Ojeda (2003), Davies *et al.* (1994), ffrench (1991), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Flores & Capriles (1998), Fraga & Narosky (1985), Freeman (1922), Harris (1998), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hellmayr (1935), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995a), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967, 1972), Klimaitis & Moschione (1987), Koepcke (1963, 1970), von Lehmann (1960), Miller (1963), Olrog (1958), Parker & Goerck (1997), Paynter & Álvarez del Toro (1957), de la Peña (1987, 1989), Perry *et al.* (1997), Remsen (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Riveros (1989), Rocha & Quiroga (1998), do Rosário (1996), Salaman (1994), Sheldon & Winkler (1993), Sick (1993), Skutch (1952, 1960, 1985), Slud (1964), Souza *et al.* (1998), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tostain *et al.* (1992), Turner (1983b), Vuilleumier (1985), Willis & Eisenmann (1979), Wilson (1926), Wolf (1976), Zimmer (1930, 1955a).

37. Pale-footed Swallow

Notiochelidon flavipes

French: Hirondelle de Chapman **German**: Blassfußschwalbe **Spanish**: Golondrina Paticlara
Other common names: Cloudforest Swallow

Taxonomy. *Pygochelidon flavipes* Chapman, 1922, Maraynioc, 10,850 feet [c. 3300 m], Junín, Peru.
Sometimes placed in genus *Pygochelidon*. Monotypic.
Distribution. Andes in W Venezuela (Trujillo S to S Táchira), W Colombia, and on E slope from Ecuador S to C Bolivia.



Descriptive notes. 12 cm; 8-8-12 g. Has crown and upperparts blackish with blue gloss; wings and tail blackish-brown, tail slightly forked; throat pale rufous, breast and abdomen white, side of body brown, undertail-coverts dark steel-blue; underwing-coverts blackish-brown. Distinguished from *N. cyanoleuca* by rufous throat, darker sides, smaller size. Sexes similar, female possibly slightly paler. Juvenile undescribed; one immature had pale edges of undertail-coverts. Voice. Calls include a sharp "tszeet" and a trilled "tr-e-e-e-e-d", unlike buzzy notes of *N. cyanoleuca*.
Habitat. Upper cloudforest and elfin forest, and forest edge. Mostly at 2400-3000 m, rarely down to 2000 and up to 3600 m; in Venezuela 2200-2400 m, once as low as 1550 m.
Food and Feeding. Diet unknown. Feeds in small groups, typically of 2-15 individuals, occasionally up to 50; hunts over forest, in clearings and along forest edge. Sometimes seen with *N. murina* or *N. cyanoleuca*, but associated more with forest habitat than are those. Flight fast, faster than that of *N. cyanoleuca*, and direct or erratic, often repeatedly backtracking.
Breeding. Unknown. Males in breeding condition in Jul-Sept. May nest in hole in moss clump on tree or in road cutting. Male with brood patch suggests that both sexes incubate.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Uncommon. Was thought to be rare, but recent records suggest that it may be widespread in Andes S to W Santa Cruz, in Bolivia, and possibly fairly common locally. First recorded in Venezuela (Mérida) in 1985, since when many records and sight reports from Trujillo S to Táchira; numerous recent records from Guaramacal National Park (Trujillo). Occurs at Cock-of-the-Rock Lodge, in Peru. Has possibly been often overlooked in the past because of its similarity to *N. cyanoleuca*.
Bibliography. Best *et al.* (1997), Bloch *et al.* (1991), Carrión & Sibley (1992), Fjeldså & Krabbe (1990), Hilty (1999, 2003), Hilty & Brown (1986), Krabbe *et al.* (1997), Lentino (1988), López (1999a), Parker & O'Neill (1980), Parker & Rowlett (1984), Remsen (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Ridgely *et al.* (1998), Ryan & Lentino (1995), Stotz *et al.* (1996), Zimmer (1955a).

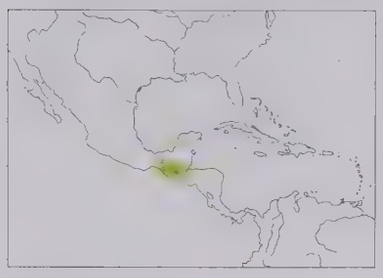
On following pages: 38. Black-capped Swallow (*Notiochelidon pileata*); 39. Andean Swallow (*Haplochelidon andecola*); 40. White-banded Swallow (*Atticora fasciata*); 41. Black-collared Swallow (*Atticora melanoleuca*); 42. White-thighed Swallow (*Neochelidon tibialis*); 43. Northern Rough-winged Swallow (*Stelgidopteryx serripennis*); 44. Southern Rough-winged Swallow (*Stelgidopteryx ruficollis*); 45. Tawny-headed Swallow (*Alopochelidon fucata*).

38. **Black-capped Swallow**

Notiochelidon pileata

French: Hirondelle à tête noire **German**: Kappenschwalbe **Spanish**: Golondrina Cabecinegra
Other common names: Coban Swallow

Taxonomy. *Atticora pileata* Gould, 1858, Guatemala.
Sometimes placed in genus *Atticora*. Monotypic.
Distribution. Highlands of S Mexico (Chiapas), S Guatemala and adjacent W Honduras and W El Salvador.



Descriptive notes. 12-13 cm. Has forehead to hindneck black with blue gloss; upperparts grey-brown, darker on rump and uppertail-coverts; wings and tail brownish-black, tail moderately forked; chin and throat white with brown flecks, breast and abdomen white, sides grey-brown, undertail-coverts blackish; underwing-coverts grey-brown. Distinguished from other hirundines by combination of brown upperparts and black head and undertail-coverts. Sexes alike. Juvenile is duller and browner, throat buffy, pale feather edges on rump and secondaries. Voice. Song is a buzzing "bzeet"; also a nasal "sreet", a buzzy "zrrieh" and a "tri-i-it".
Habitat. Open woodland, woodland edge, clearings, cultivation, and human habitations, including towns. At 1600-3100 m, at times down to 1000 m.
Food and Feeding. Diet unknown. Feeds alone or in small groups, often low over ground. Flight rapid, but with frequent periods of gliding. At one site, hunted within a few hundred metres of nests.
Breeding. Feb-Apr in Mexico, Apr-Jul in Guatemala. Solitary or in small, loose groups. Nest built by both sexes, in one case taking 5 days, of dry leaves, pine (*Pinus*) needles, fine twigs and feathers, sometimes also green leaves, and mud also recorded, placed in hole in riverbank, cliff, cave, rocks, road cutting or building; old burrows of other species, such as motmots (Momotidae), used. Clutch of 4 eggs recorded; incubation and fledging periods not documented; both sexes feed nestlings, one pair made 36 trips in course of an hour.
Movements. Some post-breeding movements. Recorded in mountains of Honduras as non-breeding visitor, and in El Salvador as a summer visitor.
Status and Conservation. Not globally threatened. Restricted-range species: present in North Central American Highlands EBA. Locally common to fairly common.
Bibliography. Amadon & Eckelberry (1955), Baepler (1962), Blake, E.R. (1953), Dearborn (1907), Friedmann *et al.* (1950), Hellmayr (1935), Howell & Webb (1995a), Komar & Domínguez (2001), Land (1970), Marshall (1943), Monroe (1968), Ridgway (1904), Skutch (1960), Stotz *et al.* (1996), Thurber *et al.* (1987), Wagner (1951), Wetmore (1941).

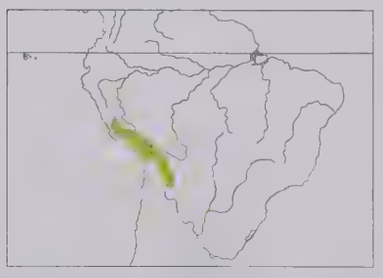
Genus *HAPLOCHELIDON* Todd, 1929

39. **Andean Swallow**

Haplochelidon andecola

French: Hirondelle des Andes **German**: Andenschwalbe **Spanish**: Golondrina Andina
Other common names: Andean Cliff Swallow (when placed in *Petrochelidon*)

Taxonomy. *Hirundo andecola* d'Orbigny and Lafresnaye, 1837, La Paz, Bolivia.
Until recently was placed in *Petrochelidon* or *Hirundo*, but now considered not related to either of those groups. DNA-DNA hybridization data strongly indicate that it belongs with the "core martin group" and is close to *Notiochelidon*, *Atticora* and *Neochelidon*. Has sometimes been included in *Stelgidopteryx*, and vocalizations similar, but lacks "serrated" edge of outer primary of that genus. Two subspecies recognized.
Subspecies and Distribution.
H. a. oroyae (Chapman, 1924) - C Peru.
H. a. andecola (d'Orbigny & Lafresnaye, 1837) - Andes in S Peru, extreme N Chile (Arica, Tarapacá), C & S Bolivia and NW Argentina (Salta, Jujuy).



Descriptive notes. 14 cm; 14-19 g. Has crown and upperparts glossy blue-black, rump light brown; wings and tail brownish-black, tail almost square; underparts grey-brown, whiter on abdomen and undertail-coverts; underwing-coverts grey-brown. Differs from *Notiochelidon murina* in pale rump and paler underparts, from *N. cyanoleuca* in less blue upperparts and darker underparts. Sexes alike. Juvenile is duller and browner than adult, rump more rufous, pale tips of wing-coverts and tertials. Race *oroyae* is larger and bluer than nominate. Voice. Song is a brief, harsh "trrrt"; also a contact call "trui".
Habitat. Open mountainous country, breeding near ravines, cliffs or human habitations; forages over open areas, such as rivers, pastures, roads and hillsides. Mostly at 2500-4400 m; observed down to 1450 m and up to 4600 m.
Food and Feeding. Dietary details not known; aerial insects. Feeds alone or, more usually, in small groups of up to c. 20 individuals; flock of c. 100 feeding over a river in Aug (presumably outside breeding season). Recorded both low above ground, at c. 1-5 m, occasionally coming down to ground, and high up, at 30-200 m; flight slow, with periods of gliding. Also feeds around grazing animals, and has been observed with *N. cyanoleuca*.
Breeding. Possibly Sept-Oct in Peru and Sept-Dec in Argentina; Dec-Mar in Bolivia. In loose groups; one was of 3-4 nests in a roof, another of three pairs apparently nesting, and a third of five birds at a single hole. Nest in hole in escarpment wall, cliff or road cutting, or in eaves or roof of building, one hole in cliff was c. 2 m above ground; reported to enlarge or dig a hole itself. Clutch size and incubation and fledging periods not documented.
Movements. May make some post-breeding movements. At one site in Peru, was present in Sept-Oct but absent in Dec.
Status and Conservation. Not globally threatened. Locally common within relatively limited range. Several thousand recorded at Laguna Tacahua, in Peru. Rather poorly known species.
Bibliography. Chebez *et al.* (1999), Fjeldså (1987), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Flores & Capriles (1998), Hellmayr (1935), Hennessey, Herzog & Sagot (2003), Jaramillo (2003), Johnson (1967, 1972), Marín (2004), Mazar Barnett & Pearman (2001), Meyer de Schauensee (1966, 1982), Morrison (1939), Niethammer (1956), Parkes (1993a), Ridgely & Tudor (1989), Sheldon & Winkler (1993), Stotz *et al.* (1996), Zimmer (1955a).

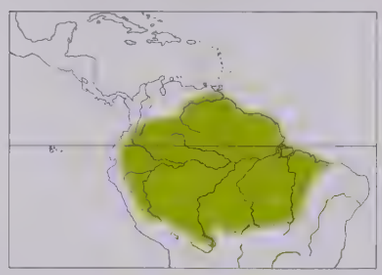
Genus *ATTICORA* Boie, 1844

40. **White-banded Swallow**

Atticora fasciata

French: Hirondelle à ceinture blanche **Spanish**: Golondrina Fajiblanca
German: Weißbandschwalbe

Taxonomy. *Hirundo fasciata* J. F. Gmelin, 1789, Cayenne.
DNA data suggest that this genus and *Neochelidon* are sister-taxa. Size decreases clinally from N to S. Monotypic.
Distribution. E Colombia, S & E Venezuela and the Guianas S to E Ecuador, E Peru, Amazonian Brazil (E to E Pará, S to Rondônia and N Mato Grosso) and N Bolivia.



Descriptive notes. 15 cm; 12-16 g. Plumage pattern and deeply forked tail distinctive. Is mostly glossy blue-black, except for broad white breastband, black wings and tail; white feathers on thighs; underwing-coverts blackish-brown. Sexes alike. Juvenile is duller, with dusky underparts, pale feather edges on wings and underparts, shorter tail. Voice. A buzzy "bzrrrt" often uttered in flight.
Habitat. Upper reaches of forested clear or black-water rivers; forages over water, in clearings, forest edge, and grassy areas with bushes. Mostly to c. 1000 m; to 700 m in Venezuela.
Food and Feeding. Diet includes flies (Diptera), hymenopterans including parasitic wasps, sawflies (Symphyta), ants and bees, also beetles (Coleoptera) and homopteran bugs. Forages alone or in small groups. Flies fast and low over water, sometimes over forest canopy. Sometimes with *A. melanoleuca* or *Tachycineta albiventer*, but stays closer to vegetation and rocks than do those.
Breeding. Poorly known. Evidence of breeding in Feb-Mar in Colombia, Dec in Surinam and Sept in Bolivia. Solitary or in loose groups. Nest of dry grass, placed in hole or burrow in riverbank; not known whether it digs own holes or uses those of other species. Clutch 4-5 eggs; no information on incubation and fledging periods.
Movements. Probably resident.
Status and Conservation. Not globally threatened. Generally uncommon or locally common; common in Peru. Present in several protected areas, e.g. Podocarpus National Park (Ecuador), and Rio Cristalino Forest Reserve (Brazil).
Bibliography. Bloch *et al.* (1991), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1935), Hilty (2003), Hilty & Brown (1986), Naumberg (1930), Niethammer (1956), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Robinson (1997), Sheldon & Winkler (1993), Sick (1993), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tostain *et al.* (1992), Zimmer, J.T. (1955a), Zimmer, K.J. & Hilty (1997), Zimmer, K.J. *et al.* (1997).

41. **Black-collared Swallow**

Atticora melanoleuca

French: Hirondelle des torrents **Spanish**: Golondrina Acollarada
German: Halsbandschwalbe

Taxonomy. *Hirundo melanoleuca* Wied, 1820, Rio Grande do Belmonte, Bahia, Brazil.
DNA data suggest that this genus and *Neochelidon* are sister-taxa. Monotypic.
Distribution. Extreme E Colombia (E Vichada, E Guainía, E Vaupés), S & E Venezuela (Amazonas, Bolívar, Delta Amacuro), the Guianas, and locally in Amazonian & S Brazil (mainly upper R Negro area, also Amapá and, S of Amazon, along drainages of rivers Madeira, Tapajós, Xingú and Tocantins, also isolated records from SE Bahia, and from upper R Paraná in S Goiás); also on Brazil-Argentina border (Iguaçu Falls).



Descriptive notes. 14 cm; 10-12 g. Combination of plumage pattern and deeply forked tail distinctive. Has glossy blue-black crown and upperparts, blackish wings and tail; white below, blue-black breastband, blue-black undertail-coverts; underwing-coverts blackish-brown. Sexes alike. Juvenile is duller and browner than adult, with dirty white underparts, shorter tail. Voice. A buzzy "jit" has been recorded.
Habitat. Rivers, especially near waterfalls and rapids; to c. 300 m.
Food and Feeding. Diet includes flies (Diptera), beetles (Coleoptera), ants and parasitic wasps (Hymenoptera), and homopteran bugs. Forages alone or in small groups, sometimes with other swallows, e.g. *A. fasciata*. Flies fast, low over water, or circles more slowly above surface; also glides high over river or forest.

Breeding. Poorly known. Recorded Feb-Mar in Venezuela (Orinoco region) and Feb in Surinam. Solitary or in loose groups. Nest of dry grass, lined with feathers, placed in hole c. 2 m up in rock or riverbank. Clutch 3 eggs recorded; no information on incubation and fledging periods.
Movements. Probably mainly resident. Some irregular movement; at site in NW Amazonas (Venezuela), common in Dec-Mar, when water levels low, but scarce or absent in Jun, when levels high.
Status and Conservation. Not globally threatened. Locally uncommon or fairly common. Most common along black-water rivers of Venezuela, the Guianas and N Brazil (upper R Negro); very local and less common away from such rivers, e.g. only small numbers at Iguaçu Falls (S Brazil-NE Argentina). Distribution poorly known; range highly fragmented.
Bibliography. Canevari *et al.* (1991), Chebez *et al.* (1999), Cherrie (1916), Contreras (1995a), Fraga & Narosky (1985), Friedmann (1948), Haverschmidt (1968), Haverschmidt & Mees (1994), Hayes (1995), Hellmayr (1935), Hilty (2003), Hilty & Brown (1986), Naumberg (1930), Parker & Goerck (1997), de la Peña (1989), Ridgely & Tudor (1989), Sick (1993), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tostain *et al.* (1992), Zimmer & Hilty (1997).

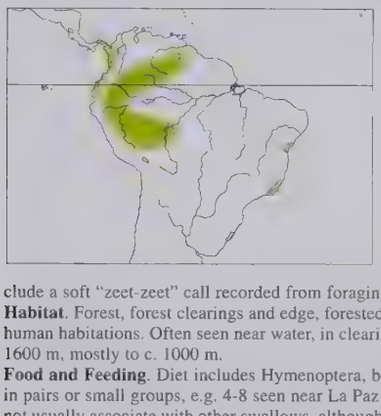
Genus *NEOCHELIDON* P. L. Sclater, 1862

42. **White-thighed Swallow**

Neochelidon tibialis

French: Hirondelle à cuisses blanches **Spanish**: Golondrina Patiblanca
German: Zwergschwalbe

Taxonomy. *Petrochelidon(?) tibialis* Cassin, 1853, type locality unknown, probably vicinity of Rio de Janeiro, Brazil.
DNA data suggest that this genus and *Atticora* are sister-taxa. Three subspecies recognized.
Subspecies and Distribution.
N. t. minima Chapman, 1924 - E Panama, W Colombia and W Ecuador (S to E Guayas).
N. t. griseiventris Chapman, 1924 - S & SE Venezuela (Amazonas, SE Bolívar), E & S Colombia, E Ecuador, E Peru, W Brazil and N Bolivia.
N. t. tibialis (Cassin, 1853) - E Brazil (E Bahia, Espírito Santo, Rio de Janeiro, E São Paulo).



Descriptive notes. 12 cm; c. 10 g. Nominate race is brownish-black with slight green sheen above, rump grey-brown; wings and tail brownish-black, tail slightly forked; underparts, including underwing-coverts, grey-brown, undertail-coverts blackish-brown; diagnostic tuft of white feathers on lower leg (but difficult to see in field). Distinguished from *Stelgidopteryx ruficollis* by small size and all-dark appearance. Sexes alike. Juvenile resembles adult, but with pale feather edges. Race *minima* is smaller, and darker brown; *griseiventris* is larger, with glossier upperparts, greyer rump and underparts. Voice. Calls include a soft "zeet-zeet" call recorded from foraging birds and "chit-it chee-dee-dit".
Habitat. Forest, forest clearings and edge, forested rivers, semi-open country with scattered trees, human habitations. Often seen near water, in clearings around farms and along roads. Lowlands to 1600 m, mostly to c. 1000 m.
Food and Feeding. Diet includes Hymenoptera, beetles (Coleoptera), bugs (Hemiptera). Forages in pairs or small groups, e.g. 4-8 seen near La Paz (Bolivia), up to 12 in Amazonas (Brazil); does not usually associate with other swallows, although sometimes with *Stelgidopteryx*. Flies in circles only c. 1 m above ground; flight erratic and bat-like. In wet weather, gleans insects from underside of leaves.
Breeding. Poorly known. Evidence of breeding in Jan and Mar-May in Colombia, and Feb, Apr-Jun and Sept in Panama. Nest of dry grass, placed in natural hole or one made by other species in tree or bank. No other information.
Movements. Poorly known. Apparently resident in Panama and in Amazonia. May make some local movements; present in upper Anchicayá Valley, in Colombia, only in Apr and Jul-Nov.
Status and Conservation. Not globally threatened. Uncommon or locally fairly common; more common W of Andes; uncommon to rare, and local, in Venezuela. Limits of distribution not well known; perhaps more widespread, both N & S of Amazon, than currently thought.
Bibliography. Bloch *et al.* (1991), Haverschmidt & Mees (1994), Hellmayr (1935), Hilty (1997, 2003), Hilty & Brown (1986), Parker & Goerck (1997), Parker & Remsen (1987), Parker *et al.* (1991), Peres & Whittaker (1991), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Robinson (1997), Salaman (1994), Sclater & Salvin (1879), Scott & Brooke (1985), Sheldon & Winkler (1993), Sick (1993), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tostain *et al.* (1992), Wetmore *et al.* (1984), Willis & Oniki (1985), Zimmer, J.T. (1955a), Zimmer, K.J. *et al.* (1997).

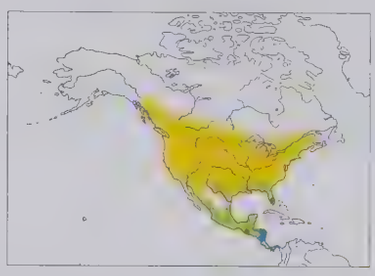
Genus *STELGIDOPTERYX* S. F. Baird, 1858

43. **Northern Rough-winged Swallow**

Stelgidopteryx serripennis

French: Hirondelle à ailes hérissées **Spanish**: Golondrina Aserrada
German: Graukehlschwalbe
Other common names: Rough-winged Swallow (when treated as conspecific with *S. ruficollis*); Ridgway's/Yucatan Rough-winged Swallow (*ridgwayi*, *stuarti*)

Taxonomy. *Hirundo serripennis* Audubon, 1838, Charleston, South Carolina, USA.
Formerly considered conspecific with *S. ruficollis*, and race *decolor* of latter has been regarded as intermediate between the two species, but they are separated altitudinally where ranges overlap in Costa Rica. Present species sometimes treated as monotypic; races intergrade and borders between them (and degree of overlap) uncertain, also N-S cline in coloration, and tendency for paler forms in SW USA and NW Mexico, also size increases N to S and wing longer towards NW; *fulvipennis* possibly not separable. Conversely, *ridgwayi* and *stuarti* sometimes regarded as constituting a separate species. Proposed race *aphracta* (W Great Basin region of USA), supposedly dark above and with greyer throat, considered undiagnosable. Six subspecies tentatively recognized.
Subspecies and Distribution.
S. s. serripennis (Audubon, 1838) - SE Alaska, and from S Canada (C British Columbia, C Alberta, C Saskatchewan, S Manitoba, W & S Ontario E to SW New Brunswick and SW Nova Scotia) S in USA to C California, N Nevada, New Mexico, C Texas and SW Florida; winters mostly SW Mexico and Florida S to C Panama.
S. s. psammochroa Griscom, 1929 - S California, S Nevada, SW Utah, SW Arizona, S New Mexico and S Texas S to S & NE Mexico (S through N coastal plains and possibly interior highlands to SW Oaxaca and Tamaulipas), possibly also S along coast to El Salvador; winters C Mexico S to Panama.
S. s. fulvipennis (P. L. Sclater, 1860) - C & S Mexico (lowlands and middle elevations from C Veracruz, E Oaxaca and E Chiapas) S to Costa Rica.
S. s. stuarti Brodkorb, 1942 - S Mexican lowlands (S from S Veracruz, Oaxaca and Chiapas) S to E Guatemala.
S. s. ridgwayi Nelson, 1901 - N Yucatán Peninsula (S to N Campeche and C Quintana Roo).
S. s. burleighi A. R. Phillips, 1986 - Belize and Guatemala (S Yucatán Peninsula).



Descriptive notes. 12·5-14·5 cm; 10·3-18·3 g. Male nominate race is grey-brown above, rump with paler feather edges; wings and tail dark grey-brown, stiff recurved barbs on outer web of outer primary, tail square-ended; pale grey-brown chin to breast, sides and flanks, throat buffy in fresh plumage, rest of underparts, including undertail-coverts, dull white; underwing-coverts light grey-brown. Differs from very similar *S. ruficollis* in having duller throat. Sexes similar, but female lacks recurved barbs on outer primary. Juvenile has cinnamon edges on upperpart feathers. Race *psammochroa* is paler than nominate; *fulvipennis* is darker above, especially on crown; *ridgwayi* has whitish spot above lores, is darker above, and longest undertail-coverts dark; *stuarti* is very like last, but generally even darker above with rufescent wash on breast and flanks; *burleighi* is darkest and brownest race. Voice. Territorial call is a series of fast "brrrt" notes; other calls include an alarm call, high notes uttered during aggression; a soft note uttered by female near nest; in Costa Rica also a trill and a gurgling "zhrit" recorded.
Habitat. Rocky gorges or open areas with exposed banks of gravel, clay or sand, such as road cuttings, streams, gravel pits; also coastal. Often near water. To c. 2500 m; in Costa Rica, generally at higher elevations than *S. ruficollis*. Feeds over open country and wetlands when not breeding. Roosts in marshes, mangroves, sugar-cane fields.
Food and Feeding. In samples taken throughout North America, diet 33% flies (Diptera), 31% Hymenoptera (mainly ants), 15% bugs (Hemiptera), 15% beetles (Coleoptera); other prey includes Orthoptera, Odonata, moths and caterpillars (Lepidoptera), mayflies (Ephemeroptera), spiders (Araneae). One report of several individuals eating cracked corn. Nestling diet mainly dipterans and hymenopterans. Flight direct, with slow deliberate wingbeats, often low over water or ground. Occasionally lands to feed on abundant source of food on ground, e.g. midges at lake edge, larvae in dead fish, or flies on waterfowl droppings.
Breeding. Egg-laying mid-May to mid-Jun in NE, early Jun to early Jul in NW; from Mar/Apr in Middle America; fledging Jul-Aug in N; single-brooded. Singly or in groups of 2-25 pairs, burrows often a few metres apart, often at edge of *Riparia riparia* colony; aggressively defends burrow and its immediate vicinity. Male follows female closely during nest-building and egg-laying. Burrow 0·2-30 m above ground (mostly 0·9-4·5 m), 20-200 cm long (mostly 30-100 cm), in clay, sand or gravel bank, occasionally excavated by bird itself, but mostly vacant burrow of other species, such as *R. riparia*, kingfisher (Alcedinidae), motmot (Momotidae), ovenbird (Furnariidae) or small mammal, used, sometimes modified by further digging; burrow sometimes reused in successive years; also uses hole in other vertical surface, including artificial ones (e.g. pipe, gutter, wall, culvert, bridge, wharf, boat and semi-trailer), rarely in tree or cave, and occasionally a ledge protected by overhang used; nest cup made from variety of vegetable fibres, such as grass, straw, rootlets, twigs, leaves, bark, pine (*Pinus*) needles, moss and dung, lined with grass, some green material included, especially in lining, all or nearly all of material collected by female, building takes 3-20 days, usually up to 7 days. Clutch 4-8 eggs, mostly 5-7, clutch size decreases with decreasing latitude, average 6·25 eggs in N USA (Michigan), 4·7 in Costa Rica; incubation by female, attentive periods 0·5-22·5 minutes, duration 16 days, in Central America possibly up to 18 days; hatching over 0·5-3·5 days, chicks brooded at high level for first few days, fed 10-20 times per hour per parent, sexes bring food about equally but female's contribution drops in last third of nestling period; fledging 17-21·5 days, average 19 days; length of dependency of fledglings unclear, estimates range from few days to several weeks, young do not usually return to burrow. Fledging success 61%; causes of losses include flooding during high spring water, erosion of nest-site, hypothermia and starvation in bad weather, and predation. Oldest recorded bird at least 5 years.
Movements. N populations are medium-distance migrants; resident in S. Forms flocks after breeding, often of hundreds of individuals, and often with other species (especially *R. riparia*). N populations winter from S USA (from S California, lower Colorado Valley and C Arizona, increasingly so since 1950s) S to Panama, but extent of wintering in USA unclear because of presence of late/early migrants (nominate race may return to California in Nov-Dec); population in W of range migrates S in Aug-Nov; that in E in Jul-Oct, but migration across Gulf of Mexico delayed until moult of flight-feathers complete, and some (possibly juveniles, which moult later than adults) winter in SE USA. Regularly recorded in Caribbean in winter. Arrival back on breeding grounds mid-Feb (S California) to late Apr (Ontario); may return to same breeding area in successive years. Populations in Mexico and farther S resident, with some local post-breeding movements; e.g. *fulvipennis* in El Salvador and Costa Rica moves to lowland areas after breeding. Vagrants recorded N to Alaska, Yukon and Newfoundland.
Status and Conservation. Not globally threatened. Population size estimated at 15,000,000 birds; more abundant in W than in E. Since 19th century breeding range has expanded N in Midwest and New England, continuing into Maine, New Brunswick and Nova Scotia; also S in Florida since 1930, and along coast of North Carolina since early 1980s. Common to fairly common but local breeder in Mexico and N Central America; less common on Mexican Plateau. Distribution patchy; breeding numbers may be limited by availability of nest-sites. Population trends in North America

variable: no significant change in 1966-1989, but significant decline of 19·6% in 1988-1989, and significant increases in E & C North America in 1965-1979. Has probably benefited from new nest-sites created by human activity, such as canal banks, quarries and road cuttings; 30-60% of nests in Canada in human-created sites; can be attracted to breed by provision of artificial nesting tubes set into vertical bank. Habitat destruction can affect populations locally.

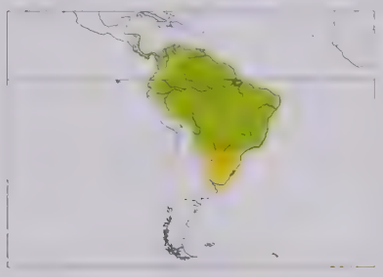
Bibliography. Amos (1991), Arendt (1992), Armstrong (1983), Baicich & Harrison (1997), Beecher *et al.* (1986), Behle (1985), Bent (1942), Best (1977), Binford (1989), Blake, C.H. (1953), Blake, F.G. (1907), Brodkorb (1942), Brown & Hoogland (1986), Campbell, Dawe *et al.* (1997), Clapp (1992), Contreras (1997), Cyr & Larivée (1995), DeGraaf & Rappole (1995), DeGraaf & Rudis (1986), DeJong (1996), Erskine (1979), Eynon (1936), Finch, D.M. (1991), Gillespie (1934), Godfrey (1986), Griscom (1929), Hellmayr (1935), Hespenheide (1975), Hill (1988), Hoag (2000), Howell & Webb (1995a), Husmann (1981), Jackson (1993), Johnsgard (1979), Johnson (1994), Kaufman (1996), Kingery & Kingery (1995), Lee Jones (2004), Lethaby (1996), Lunk (1962), Michael (1992), Nickell (1949), Peck & James (1987), Peterjohn (1989), Peterjohn *et al.* (1995), Platania & Clark (1981), Price *et al.* (1995), Rappole *et al.* (1995), Ricklefs (1972), Ridgely & Gwynne (1989), Robertson & Kushlan (1974), Root (1988), Sauer & Droege (1992), Screws (1991), Sealy (1982), Skutch (1960, 1981), Small (1994), Stevenson & Anderson (1994), Stiles (1981), Stiles & Skutch (1989), Stotz *et al.* (1996), Van Fleet (1876), Weydemeyer (1933), Wolinski (1980), Yuri & Rohwer (1997).

44. **Southern Rough-winged Swallow**

Stelgidopteryx ruficollis

French: Hirondelle à gorge rousse **German**: Zimtkehlschwalbe **Spanish**: Golondrina Gorgirrufa
Other common names: Rough-winged Swallow (when treated as conspecific with *S. serripennis*)

Taxonomy. *Hirundo ruficollis* Vieillot, 1817, Brazil.
Formerly considered conspecific with *S. serripennis*, and race *decolor* has been regarded as intermediate between the two species, but they are separated altitudinally where ranges overlap in Costa Rica. Present species sometimes treated as monotypic, as races intergrade, also depth of plumage colour varies clinally, becoming generally darker from N to S & E. Birds from Surinam named as race *cacabata*, but description believed to have been based on migrants of nominate race. Four subspecies usually recognized.
Subspecies and Distribution.
S. r. decolor Griscom, 1929 - W Costa Rica and W Panama.
S. r. uropygialis (Lawrence, 1863) - Caribbean lowlands S from E Honduras, Pacific lowlands of E Panama, W Colombia, Ecuador and NW Peru.
S. r. aequalis Bangs, 1901 - N Colombia, W Venezuela and Trinidad.
S. r. ruficollis (Vieillot, 1817) - SE Colombia, E Venezuela, the Guianas and Brazil S to E Peru, Bolivia, N & NE Argentina (S to Salta, Formosa, Entre Ríos and N Buenos Aires) and Uruguay.



Descriptive notes. 13 cm; 14-18 g. Male nominate race is mainly dark grey-brown, slightly darker on crown than on back, slightly paler rump; wings and tail blackish-brown, stiff recurved barbs on outer web of outer primary, tail square-ended; throat cinnamon, rest of underparts dark grey-brown, becoming yellowish on abdomen, with undertail-coverts white; underwing-coverts dark grey-brown. Distinguished from *S. serripennis* by brighter throat, from *Alopochelidon fucata* by grey-brown head and paler rump. Sexes similar, but female lacks recurved barbs on outer primary. Juvenile has duller throat, pale edges of feathers on back. Race *decolor* is palest, with dark shaft streaks below; *uropygialis* is darker than previous, rump conspicuously whitish; *aequalis* is light brown above, rump pale, throat tawny-buff. Voice. Similar to *S. ruficollis* but lower-pitched and less harsh (*uropygialis*); calls include twitters or buzzy notes at nest-site, most commonly an upslurred "suree".
Habitat. Open country, particularly near water, also forest clearings, and along rivers. Usually below 1000 m, locally to 2000 m, and recorded to 3600 m; in Costa Rica, generally at lower elevations than *S. serripennis*.
Food and Feeding. Diet includes flies (Diptera), beetles (Coleoptera), heteropteran bugs, and flying ants and other Hymenoptera. Feeds alone or in small groups, generally low or at medium height over ground or water. Flight usually direct, with slow, deliberate wingbeats.
Breeding. Mar/Apr-Jun in Central America and Trinidad, Feb-Jul in Colombia; single-brooded. Solitary or in small loose groups; aggressive towards intruders. Nest of dry grass, leaves and feathers, in hole or old burrow in riverbank, quarry or road cutting; burrow usually made by other species, e.g. motmot (Momotidae), but has been recorded as digging. Clutch 4-6 eggs in Central America, 3-6 in Trinidad, 3-5 in S of range; incubation by female, 15-18 days; chicks fed by both sexes, fledging 18-21 days; young stay near nest-site and are fed for several days, once for at least 25 days.
Movements. Apparently resident in N, pairs staying near nest-site; migratory in S. Forms large flocks after breeding. Nominate race has been recorded in N of breeding range (e.g. Colombia, Surinam) in non-breeding season, and likely to occur in neighbouring countries, but extent of non-breeding distribution not known. Vagrant in Falkland Is.
Status and Conservation. Not globally threatened. Generally common and widespread; sometimes sparse and local. Restricted to areas with natural nest-sites, as it does not often use artificial ones.

Bibliography. Belton (1985), Bloch *et al.* (1991), Canevari *et al.* (1991), Capper *et al.* (2000), Chebez *et al.* (1999), Davies *et al.* (1994), Faaborg & Terborgh (1980), ffrench (1991), Fjeldså & Krabbe (1990), Fraga & Narosky (1985), Freeman (1922), Griscom (1929), Haverschmidt (1968, 1982), Haverschmidt & Mees (1994), Hayes (1995), Hellmayr (1935), Hespenheide (1975, 1980), Hilty (1997, 2003), Hilty & Brown (1986), Miller (1963), Monroe (1968), Moojen *et al.* (1941), Parker & Goerck (1997), de la Peña (1989), Pereyra (1969), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Robinson (1997), do Rosário (1996), Salaman (1994), Short (1975), Skutch (1981, 1985), Slud (1964), Souza *et al.* (1998), Stiles (1980, 1981), Stiles & Skutch (1989), Stotz, Fitzpatrick *et al.* (1996), Stotz, Lanyon *et al.* (1997), Tostain *et al.* (1992), Tramer (1980), Wagner (1951), Wetmore *et al.* (1984), Willis (1980), Zimmer, J.T. (1930, 1955a), Zimmer, K.J. & Hilty (1997), Zimmer, K.J. *et al.* (1997).

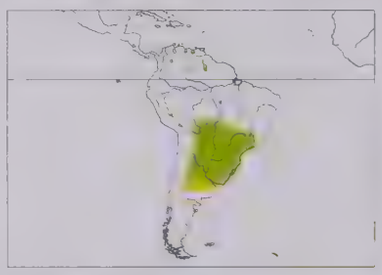
Genus *ALOPOCHELIDON* Ridgway, 1903

45. **Tawny-headed Swallow**

Alopochelidon fucata

French: Hirondelle fardée **German**: Fuchsschwalbe **Spanish**: Golondrina Cabecicastaña

Taxonomy. *Hirundo fucata* Temminck, 1822, Brazil.
Genus sometimes merged with *Stelgidopteryx*, but lacks serrated wing edge of latter. Monotypic.
Distribution. SE Peru (Cuzco), and from E Bolivia (S from NE Cochabamba and Santa Cruz) and S Brazil (S from Mato Grosso, S Goiás and Minas Gerais) S to N Argentina (S to Mendoza and Buenos Aires) and Uruguay; also N South America in non-breeding season.



Descriptive notes. 12 cm; 13-15 g. Has tawny-rufous top of head, darker on central crown, tawny-buff side of head, throat and breast; upperparts grey-brown, rump with paler feather edges; wings and tail dark brown, tail almost square; abdomen and undertail-coverts white, underwing-coverts grey-brown. Differs from *Stelgidopteryx ruficollis* in tawny head, darker rump and smaller size. Sexes alike. Juvenile resembles adult, but head yellowish-fawn rather than tawny-rufous. Voice. A soft "treeb" uttered in flight.
Habitat. Open areas, especially grassland, particularly near water such as marshes, ponds and streams. Up to 1600 m.
Food and Feeding. Diet includes flies (Diptera), beetles (Coleoptera) and Hymenoptera. Forages in pairs or small groups, not usually with other hirundines; flight direct, often low over ground.
Breeding. Sept-Nov. Solitary or in small loose groups. Nest of dry grass and feathers, placed in chamber at end of burrow, 1 m or more long, in riverbank or ditch; not known if digs own burrow or uses or adapts existing one. Clutch 4-5 eggs, rarely 6, in Argentina; no information on incubation and fledging periods.
Movements. Migratory in S. Forms post-breeding flocks, sometimes large ones (one of over 100 individuals). Absent from S parts of range Apr-Jul; non-breeding distribution not well known, possibly in N part of main breeding range, but recorded as far N as Colombia and N Venezuela. In SE Brazil (Rio Grande do Sul), present all year but more common in austral winter, perhaps the result of seasonal immigration from S. Wanderers also recorded S of breeding range in Argentina (S to Río Negro), and in Falkland Is.
Status and Conservation. Not globally threatened. Generally uncommon or fairly common; rare in Peru. Limits of distribution not well known; possibly more widespread than currently realized. Apparently resident, and possibly breeds, in E Venezuela (Gran Sabana) and adjacent N Brazil (NE Roraima), as birds caught there were in breeding condition; further fieldwork required in that region. Restricted to areas with natural nest-sites, and rarely uses artificial ones.

Bibliography. Belton (1985), Brooks *et al.* (1993), Canevari *et al.* (1991), Capper *et al.* (2000), Chebez *et al.* (1999), Contreras (1995a), Dinelli (1924), Fraga & Narosky (1985), Guzmán (1998), Hayes (1995), Hellmayr (1935), Hilty (2003), Hilty & Brown (1986), Lowen *et al.* (1996), Mazar Barnett & Pearman (2001), Narosky & Yzurieta (1993), Nores *et al.* (1983), Parker *et al.* (1991), de la Peña (1989), Pereyra (1969), Ridgely & Tudor (1989), do Rosário (1996), Short (1975), Sick (1993), Stotz *et al.* (1996), Verheyden (1994), Zimmer (1955a).

PLATE 67 ➤


inches 4
cm 10
PLATE 67
ssp rustica
ssp erythrogaster
ssp transitiva
ssp lucida
47
48
ssp subalaris
46
ssp gutturalis
ssp saturata
ssp subfusca
49
ssp domicola
ssp tahitica
ssp javanica
50
51
52
♂
ssp filifera
53
♂
♀
ssp smithii
54
55
♂
♀
58
56
57
59

Genus *HIRUNDO* Linnaeus, 1758

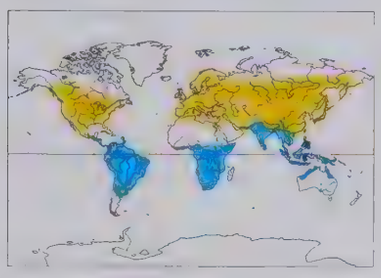
46. **Barn Swallow**

Hirundo rustica

French: Hirondelle rustique **German**: Rauchschwalbe **Spanish**: Golondrina Común
Other common names: Swallow, Chimney/Common/House/Rustic Swallow; American Barn Swallow (*erythrogaster*); European/Eurasian Swallow (*rustica*); Nile/Egyptian Swallow (*savignii*)

Taxonomy. *Hirundo rustica* Linnaeus, 1758, Sweden.
Forms a superspecies with *H. lucida*, *H. angolensis*, *H. tahitica*, *H. neoxena*, *H. albigularis* and *H. aethiopica*, at least some of which have sometimes been considered conspecific with present species. Taxonomy uncertain; races possibly constitute two or more species, with sister-taxa in North America and Siberia. American race *erythrogaster* most resembles E Asian forms in colour and breastband pattern, but mitochondrial-DNA studies, combined with behaviour, suggest that it may be a separate species from that in Old World; proposed race *insularis*, from islands in N Gulf of Mexico, considered inseparable from mainland breeders. Populations in Eurasia intergrade; *mandschurica* often included in *saturata*, which itself is often subsumed in *gutturalis* or *tytleri*; birds from N India (Sikkim), originally described as separate race *ambigua*, probably belong in *gutturalis*, although sometimes included in nominate. In addition, clinal variation apparent: tail length decreases from N to S, and in Eurasia size decreases from NW & NE to S & E. Hybridizes with *Petrochelidon pyrrhonota* and *P. fulva* in America, and with *Delichon urbicum* in Europe and Asia. Eight subspecies tentatively recognized.

Subspecies and Distribution.
H. r. erythrogaster Boddaert, 1783 - breeds North America from S Alaska and W & S Canada (S from S Yukon, CW Mackenzie, N Saskatchewan, N Manitoba, N Ontario, SC Quebec and S Newfoundland) S through most of USA (except extreme SW, also S Florida) to Mexico (NW Baja California, and interior S to Colima, Michoacán and Puebla); also South America in E Argentina (N Buenos Aires). Winters from Pacific slope of C Mexico and W Panama, and E West Indies (Puerto Rico, Lesser Antilles), S through most of South America.
H. r. rustica Linnaeus, 1758 - Europe and W Asia from Ireland, Britain and N Scandinavia E to C Russia (E to R Yenisey), W Mongolia and W China, S to Mediterranean, N Africa (E to Libya), Iraq and C Himalayas; winters mainly sub-Saharan Africa, also S Asia.
H. r. savignii Stephens, 1817 - Egypt (Nile Valley).
H. r. transitiva (Hartert, 1910) - Lebanon, Syria, Israel and W Jordan.
H. r. tytleri Jerdon, 1864 - SC Siberia (R Yenisey E to Yakutskaya) S to N Inner Mongolia; winters E India and SE Asia.
H. r. saturata Ridgway, 1883 - E Russia (Kamchatka and Sea of Okhotsk coast S to mid-Amur Basin); winters SE Asia.
H. r. mandschurica Meise, 1934 - NE China; winters SE Asia.
H. r. gutturalis Scopoli, 1786 - E Himalayas, S, C & E China, Korea and lower R Amur E to Kuril Is, Japan and Taiwan, also possibly irregularly in Kamchatka; winters S & SE Asia S to N Australia.



Descriptive notes. 18 cm; 16-24 g. Distinctive plumage pattern and long tail-streamers. Male nominate race has forehead rufous-chestnut, crown and upperparts glossy steel-blue; wings and tail black, white patches on inner webs of rectrices (except innermost pair), outer tail feathers greatly elongated; throat rufous-chestnut, broad steel-blue breastband; rest of underparts, including undertail-coverts and underwing-coverts, creamy or buffy white. Female is less glossy, with shorter tail-streamers. Juvenile is duller, forehead and throat paler, short tail. Races differ in size, extent of breastband (narrower in Asian races), and colour of underparts (but underpart colour also varies individually within a population, and, within pairs, females tend to be paler below than mates): *savignii* has underparts rufous-chestnut; *transitiva* has underparts rufous-buff; *tytleri* has underparts rufous-chestnut; *saturata* is rusty-ochre below; *mandschurica* differs from previous in having paler ochre underparts; *gutturalis* has creamy white underparts; *erythrogaster* has throat more extensively rufous, blue band reduced to patch on each side of breast, underparts rufous-chestnut to orange. Voice. Song is a rapid twittering often ending in a harsh rattle; main contact call is "witt-witt", often repeated to form a twitter and uttered in flight or at nest; females also have own contact call, "tir-huit"; parents call when landing at nest to feed chicks; males use a "wi-wi-wi" call to attract females to nest-site and to entice chicks to leave nest; other calls include a courtship call "it-it-it", and a copulation call "waeae-waeae", and various alarm and distress calls such as the "chirr-chirr" directed at conspecifics and predators, a "tsi-wit" alarm call frequently uttered when a predator is close, a "dschiddschid" uttered in flight, a low pitched "flüh-flüh" when chased, a soft "dewihlik", and a sharp "weer-weer" when caught by a predator. American race *erythrogaster* has similar calls to nominate, including a twittering song, a chirping contact call, stuttering threat or anger calls, various alarm calls, a whistling call used to maintain pair-bond, a whining call during copulation and a "cheet" call used by parents feeding fledglings.

Habitat. Open country, cultivation, human habitations, often near water. In Europe and North America mainly a rural bird, with preference for breeding on farms with livestock (especially cattle) in N & C Europe; in N Africa and Asia, often breeds in busy towns and cities. From sea-level to c. 3000 m, usually below 1000 m in Europe. Forages over variety of open habitats, in adverse weather also often over waterbodies. On African wintering grounds usually near wetlands. Roosts mainly in reedbeds or other dense vegetation in or near water, tall grasses, crops, bushes or tree canopy; also on overhead wires in towns, and on or in buildings, especially in cold weather.

Food and Feeding. Diet varies within and between years and sites, depending on local availability of insects. More than 80 insect families recorded in diet: large dipteran flies, such as hoverflies (Syrphidae), horseflies (Tabanidae) and blowflies (Calliphoridae), important prey in breeding season, with more aphids and fewer large flies taken as season progresses; flying ants and termites (Isoptera) important in winter. In samples taken throughout North America, 40% of prey items were flies (Diptera), 23% Hymenoptera, 16% beetles (Coleoptera), 15% bugs (Hemiptera). In Scotland, 82% dipterans, 5% Hymenoptera, 12% beetles, with adult diet in early summer 69% dipterans, 1% Hymenoptera, 26% beetles. Nestling diet in Europe 43-76% dipterans, 1-5% Hymenoptera, 1-5% beetles, 9-28% hemipterans. On wintering grounds, 8% dipterans, 48% Hymenoptera and 37% coleopterans in Africa (Malawi), and 8% dipterans, 82% Hymenoptera and 6% coleopterans in Malaysia. The Hymenoptera taken are mostly ants and parasitic wasps, with few wasps and bees (mostly drones). Other arthropods in diet include psocids (Psocoptera), Odonata (mainly damselflies), Lepidoptera (adults, occasionally caterpillars), mayflies (Ephemeroptera), grasshoppers and crickets (Orthoptera), caddis flies (Trichoptera), lacewings (Neuroptera), earwigs (Dermaptera), amphipods and spiders (Araneae). In S Africa non-breeding migrants also eat arillate seeds of acacia trees (*Acacia*); a few records of berries being eaten. Feeds alone or in pairs in breeding season, mostly low down, on average 7 m (often less than 1 m) above ground or water. Forages at up to c. 600 m from nest, average distance 170 m. Flight straight and rapid, with frequent sharp turns to catch prey; infrequent, short glides. Sometimes take prey from ground, vegetation, water or other surfaces, while either perching or hovering, especially in adverse weather. Follows other animals and tractors to take insects flushed by them.

Breeding. Mainly May-Aug, starting later at higher latitudes (e.g. early Jun in Finland) and earlier in S (e.g. from Feb-Mar in N Africa); Nov-Mar in Argentina; when nesting in group, laying occurs over extended period; 1-3 broods (1-2 in North America), single-brood females lay later than those with multiple broods, and older females more likely than first-years to have two broods. Socially monogamous, occasionally polygynous; extra-pair paternity common, c. a third of nestlings in European studies, 22% in Canada (Ontario). Solitary or in groups of usually 2-30 pairs, but groups of up to 250 pairs recorded; average inter-nest distance in groups 3-5 m, but can be as little as 10-20 cm, especially when population density high; area of 4-25 m² around nest defended. Male attracts females to nest or site by displaying tail and singing, also communal singing displays while circling above breeding site; male sings to solicit copulation, which occurs on perches outside as well as near or in nest, also guards mate during nest-building and egg-laying. Both sexes build nest, a cup or half-cup c. 20 cm wide × 10 cm high, made from mud pellets mixed with fibres such as dry grass, straw and horsehair, lined with dry grass, then white feathers, construction usually takes 7-10 days, with additional few days for lining; female adds feathers during incubation and removes them as nestlings grow; nests often repaired and reused, with mud added to rim, can last for 12-15 years, occasionally up to 48 years; site originally in cave or cliff, sometimes in hollow tree, now almost always in or on artificial structure such as building, barn, bridge, culvert, well or mine shaft, and placed usually 2-5 m above ground or water on ledge or vertical wall close to an overhang; objects projecting from wall (such as a nail or a wasp nest) often used as a base. Clutch 2-7 eggs, usually 3-6, and 4 or 5 most common (e.g. of 177 clutches in Scotland, 34% were of 4 eggs, 51% of 5, 12% of 6, 3% of 2-3); size of second (but not of first) clutch increases with latitude (averages 4·07 in Iraq to 4·75 in Finland), also decline through season (e.g. in Spain first clutch 4·99, second 4·52, third 3·89); egg-dumping by conspecifics occurs (3% in a Spanish study, with nest-owner male sometimes the father); incubation by female alone in most races, in North America (*erythrogaster*) male does small and variable amount (average 9% in Ontario), bouts average 7-10 minutes, longer in cold weather, incubation period 13-16 days; eggs hatch mostly over 1 day (up to 3 days), chicks brooded at decreasing rate for 6-9 days, older chicks still brooded in bad weather and at night, fed by both sexes (male's contribution varies among pairs), feeding rate varies with brood size and age, weather conditions and time of season (e.g. in Scotland averages of 32·3 visits per hour for first broods, 26·5 for second broods), male brings smaller food boluses than female; young leave nest at c. 21 days (variable, 18-27 days), stay near site and away from other families, roost in nest, and fed by parents for c. 1 week, independent after 1-2 weeks. Average breeding success c. 70-90%, but can be reduced especially by prolonged bad weather and parasite infestations; annual productivity 0-16 fledglings per pair, average 4·2-7·1; nest competitors include *Petrochelidon pyrrhonota* and *Delichon urbicum*, effect usually minor, but House Sparrows (*Passer domesticus*) can have major impact; predation uncommon, but can be locally important cause of mortality; in one study, infanticide accounted for 32% of chick deaths over 5 years. Recorded longevity 15 years 11 months.

Movements. Mainly long-distance migrant. On breeding grounds mainly Apr-Oct; forms large post-breeding flocks and roosts, sometimes hundreds of thousands or millions of birds. Autumn migration is over a broader front than that in spring and takes several months; routes along coastlines or over land, e.g. many W European birds head for Iberian Peninsula and the Mediterranean. Those breeding in S Europe and N Africa leave Jul-Aug, but peak of migration in N & C Europe Sept/early Oct; arrives in N Africa in large numbers from mid-Sept to late Oct, and in S Africa in Nov, present in Africa mainly Sept-Apr, with some in Aug and May and a few in Jun and Jul. Different populations tend to migrate to different areas (but mix to some extent), N African and S European birds to W Africa, N & C European birds to S & SW Africa, but E birds tend to winter on E side and W birds on W side (E-W divide most marked in C Africa); also, individuals from particular areas tend to be recorded in particular parts of wintering range, e.g. British and Russian predominate in S Africa. Wintering areas sometimes change (British and Irish birds extended range, from E South Africa and S to E Cape Province, to farther S & W after 1961, following a drought); generally faithful to winter sites in subsequent years. Return migration to N & C European breeding grounds starts Jan-Mar, mainly Feb, and most have left by late Apr; peak passage in N Africa and Mediterranean mid-Mar to late Apr, and in NW Europe mid-Apr to mid-May; birds breeding in N Africa and S Europe arrive mainly Feb-Mar. Non-breeding range of North America populations extends from Pacific slope of C Mexico and W Panama, Puerto Rico and Lesser Antilles S to C Chile and N Argentina, rarely farther S; autumn departure in N relatively earlier than in Europe, e.g. late Aug to early Sept at Cape May (New Jersey) and in British Columbia; most travel down coastal lowlands of Middle America, some flying via the Gulf of Mexico and Caribbean, and first migrants in South America recorded Aug in Colombia, Surinam and French Guiana, early Sept in Brazil and Paraguay, late Sept in Argentina; main spring migration through Middle America in Mar-May, and in West Indies and Bermuda Apr-May; some also remain in South America during N summer. E Asian races (*tytleri*, *saturata*, *mandschurica*, *gutturalis*) make similar long-distance movements, migrating to S Asia, e.g. populations breeding in SE Siberia, Korea and Japan recorded in Thailand, Malaysia, Borneo and Philippines; winter range of *gutturalis* has extended S to N Australia during 20th century, with a few records also in E & S Africa. Migratory races also regularly recorded in winter in S parts of breeding range, e.g. Spain and N

On following pages: 47. Red-chested Swallow (*Hirundo lucida*); 48. Angolan Swallow (*Hirundo angolensis*); 49. Pacific Swallow (*Hirundo tahitica*); 50. Welcome Swallow (*Hirundo neoxena*); 51. White-throated Swallow (*Hirundo albigularis*); 52. Ethiopian Swallow (*Hirundo aethiopica*); 53. Wire-tailed Swallow (*Hirundo smithii*); 54. White-throated Blue Swallow (*Hirundo nigrita*); 55. Pied-winged Swallow (*Hirundo leucosoma*); 56. White-tailed Swallow (*Hirundo megaensis*); 57. Pearl-breasted Swallow (*Hirundo dimidiata*); 58. Montane Blue Swallow (*Hirundo atrocaerulea*); 59. Black-and-rufous Swallow (*Hirundo nigrorufa*).

Africa, E Mediterranean, S islands of Japan, and *erythrogaster* casually in C California, SW USA, N Mexico and S Florida. Timing of arrival on breeding grounds is related to prevailing temperature; also, older males arrive back first; adults normally return in subsequent seasons to same site (generally fewer than 5% change site), and often to same nest (in North American study, 65% returned to same or neighbouring nest). Egyptian *savignii* is resident; Middle East race *transitiva* probably migrates short distances, recorded in non-breeding season farther W (in Egypt) and unconfirmed (but doubtful) reports farther S. Widespread vagrant, e.g. N Alaska, St Lawrence I, Pribilof Is and Aleutian Is, Greenland, Jan Mayen, Bear I, Spitsbergen, Hawaiian Is, Falkland Is, South Georgia, Tristan da Cunha.

Status and Conservation. Not globally threatened. Generally very common and widespread, but marked declines in some areas. In terms of population size and range, has probably benefited greatly from increased nesting opportunities provided by human activities; is, however, vulnerable to periods of cold, wet weather on breeding grounds and drought in non-breeding quarters (especially Africa), and fluctuations in population size are common. In North America, decreased in NE USA in late 1800s, possibly because of introduced House Sparrows, which are serious nest-site competitors, taking over nests and destroying eggs and nestlings, but range expanded in latter half of 20th century owing to increased availability of nest-sites on new bridges, culverts and buildings in areas previously unsuitable (e.g. in California, Arkansas, Tennessee, Louisiana, Mississippi, Alabama). Between 1966 and 1994, population in North America increased in USA but decreased in Canada; spread in Florida by 1987, after first nesting in 1946, and increased in Carolinas, Georgia and S Mexico (Colima). First confirmed nesting in South America in 1980; restricted to N Buenos Aires, but indication of recent spread there. In Europe and Russia, total population c. 13,000,000-33,000,000 breeding pairs. Some local declines evident in UK; widespread decline of 20-50% occurred 1970-1990 in W & C Europe, and recent range contractions in some countries, including Spain and Austria; one Danish population showed mean decline of 7·6% per year during 1984-1999. Little direct impact of human activities on populations, although some hunting for food or sport occurs, and nests sometimes regarded as a nuisance and removed. Main threat has been intensification of agriculture with loss of suitable foraging areas, such as waterbodies and hedges, and reduction in insect abundance from pesticide use, as well as loss of nest-sites; in particular, a reduction in dairy farming has been associated with lower population abundance, reproductive success and nestling growth. Can be encouraged to nest by provision of wooden ledges or of artificial nest cups made of cement and sawdust or papier maché.

Bibliography. Al-Rawy & Kainady (1976), Ambrosini *et al.* (2002), Anthony & Ely (1976), Archipenko *et al.* (1968), Ball (1982, 1983), Banbura (1992), Banbura & Zielinski (1995a, 1995b, 1995c, 1998a, 1998b, 2000), Barbosa (1999), Barbosa & Møller (1999a, 1999b), Barbosa *et al.* (2002), Barclay (1988), Barrentine (1980), Beser (1968), Blake *et al.* (1990), van den Brink *et al.* (1997, 2000), Broekhuysen & Brown (1963), Brown (1985), Brown & Brown (1999a, 1999b), Brown & Hoogland (1986), Brown & Sherman (1989), Bruderer (1975), Bryant & Turner (1982), Buchanan & Evans (2000), Bulgarini & Visentin (1997), Clancey (1970), Crook & Shields (1985, 1987), Cuervo, de Lope & Møller (1996), Cuervo, de Lope, Møller & Moreno (1996), de la Cueva & Blake (1997), Dickinson *et al.* (2002), Dolnik & Kinzhewskaja (1980), Engen *et al.* (2001), Evans, K.L. (2004), Evans, M.R. (1998), Evans, M.R. & Thomas (1997), Fujita (1993), Fujita & Higuchi (1992), Galeotti *et al.* (1997), Gatter & Behrndt (1985), George (1976), George & Al-Rawy (1970), Gibbons *et al.* (1996), Goodman (1982), Grue *et al.* (1984), Grzybowski (1979), Guillory & LeBlanc (1975), Gullion (1947b), Hartley (1941), Hebblethwaite & Shields (1990), Holroyd (1975), Huin & Sparks (1998), Hutton (1978), Jarry (1999), Jones (1987d, 1987e, 1987f, 1988), Kanai (1960, 1961, 1964), Kang (1971), Kendeigh (1952), Kilgore & Knudsen (1977), Kose & Møller (1999), Kozená (1979, 1980), Kuzniak (1967), Languy & Vansteenwegen (1989), Loesche *et al.* (1991), Lohoefener (1980), de Lope (1983, 1985), de Lope & de la Cruz (1989), de Lope & Møller (1993a, 1993b), Loske (1984, 1986a, 1989, 1990a, 1990b, 1994, 1996), Lotem (1998), Lyuleeva (1973, 1974), Martin (1974, 1980), Martin & Selander (1975), Martínez (1983), Mason (1953), McGillivray & Levenson (1986), McGinn & Clark (1978), Mead (1970, 1972), Medvin & Beecher (1986), Medvin, Beecher & Andelman (1987), Medvin, Stoddard & Beecher (1992, 1993), Medway (1973), Merino *et al.* (2000), Meservey & Kraus (1976), Møller (1994a, 1994b, 1994c, 1994d, 1994e, 1994f, 1994g, 1995, 1996a, 1996b, 2001a, 2001b), Møller & Barbosa (2001), Møller & de Lope (1994, 1999), Møller & Tegelström (1997), Møller, Barbosa *et al.* (1998), Møller, de Lope & Caballero (1995), Møller, de Lope & Saino (1995), Møller, Magnhagen *et al.* (1995), Møller, Saino *et al.* (1998), Moreno & Møller (1996), Norberg (1994), Oatley (2000), Ormerod (1989, 1991), Patterson (1981), Pilastro & Magnani (1997), Pilastro & Spina (1999), Pilastro *et al.* (1998), Pons (1989), Purchon (1948), Radermacher (1970, 1989), Rheinwald & Schulze-Hagen (1972), Ribault (1982), Ricklefs (1967), Rowan (1968, 1972), Saino & Møller (1994, 1995a, 1995b, 1996), Saino, Bolzern & Møller (1997), Saino, Calza & Møller (1997, 1998), Saino, Calza, Ninni & Møller (1999), Saino, Cuervo, Krivacek *et al.* (1997), Saino, Cuervo, Ninni *et al.* (1997), Saino, Ellegren & Møller (1999), Saino, Galeotti *et al.* (1997), Saino, Incagli *et al.* (2002), Saino, Martinelli & Møller (2001), Saino, Møller & Bolzern (1995), Saino, Ninni, Calza *et al.* (2000), Saino, Ninni, Incagli *et al.* (2000), Saino, Primmer *et al.* (1997), Saino, Stradi *et al.* (1999), Samuel (1969a, 1971a, 1971b, 1971c), Schulze-Hagen (1970), Shields (1984a, 1984b), Shields & Crook (1987), Shields *et al.* (1988), Smith, H.G. & Montgomerie (1991, 1992), Smith, H.G. *et al.* (1991), Smith, M.J. & Graves (1978), Snapp (1973, 1976), Soler *et al.* (1998), Speich *et al.* (1986), Stresemann & Stresemann (1968), Thompson (1992), Tsvelykh & Goroshko (1991), Turner (1980, 1982b, 1982c, 1983a, 1994a, 1994b), Vansteenwegen (1982, 1988, 1992), Vietinghoff-Riesch (1955), Wang (1959), Ward (1992, 1995, 1996), Waugh (1978), Weatherhead *et al.* (1985), Westerterp & Bryant (1984), Wolinski (1985b), Zielinski & Banbura (1995, 1998), Zink (1969), Zink *et al.* (1995).

47. **Red-chested Swallow**

Hirundo lucida

French: Hirondelle de Guinée **German**: Singschwalbe **Spanish**: Golondrina de Guinea
Other common names: African (Barn) Swallow; Gambian (Barn) Swallow (*lucida*)

Taxonomy. *Hirundo lucida* Hartlaub, 1858, Casamance River, Senegal.

Forms a superspecies with *H. rustica*, *H. angolensis*, *H. tahitica*, *H. neoxena*, *H. albigularis* and *H. aethiopica*; has been considered conspecific with *H. rustica*. Paler birds from N part of range of nominate often separated as race *clara*, but variation probably clinal. Three subspecies recognized.

Subspecies and Distribution.

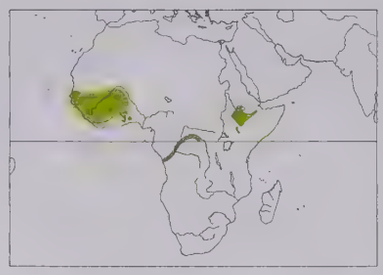
H. l. lucida Hartlaub, 1858 - Senegal and extreme S Mauritania E to SW Niger, S to Liberia, N Togo and Benin.

H. l. rothschildi Neumann, 1904 - Ethiopian Highlands.

H. l. subalaris Reichenow, 1905 - R Congo.

Descriptive notes. 15 cm; 12-14 g. Has forehead rufous-chestnut, crown and upperparts glossy steel-blue; wings and tail black, tail moderately forked, large white patches on inner webs of rectrices (except central pair); throat and upper breast rufous-chestnut, blue breastband narrower (sometimes broken) in centre, rest of underparts white; dusky underwing-coverts. Differs from *H. rustica* in thinner breastband, shorter tail with more white in it. Female has shorter tail than male. Juvenile is duller, with rufous areas paler, shorter tail. Race *rothschildi* is more violet-blue above; *subalaris* has rufous areas darker, more chestnut. VOICE. Song is a weak, but clear and loud, twittering.

Habitat. Open country, grassland, savanna, marshes, rivers and lakes, forest clearings and human habitations. Lowlands; 1800-2750 m in Ethiopia.



Food and Feeding. Diet includes termites (Isoptera). Feeds alone, in pairs or in small groups, sometimes flocks of 40 or more individuals, often with other hirundines; low or at moderate heights. Flight rapid, with frequent banking and turning, as that of *H. rustica*.

Breeding. Mar-Jul and Dec in Senegal, Mar-Jun in Gambia, Jul-Aug in Mauritania, Aug-Sept in Mali, Sept-Oct in Niger, and Mar-Apr, Jun-Aug and Dec in Togo; Feb-May and Aug-Sept in DRCongo; Apr-Jun, perhaps also Feb, in Ethiopia; may be double-brooded. Solitary or in small, loose groups. Nest an open cup made of mud pellets mixed with grass, lined with dry grass and feathers, placed on termite mound, rock, bridge, verandah, under eaves or, especially, in building, often on beam; nest sometimes reused. Clutch 3-4 eggs; no information on incubation and fledging periods.

Movements. Mainly resident. Movements occur in some parts of W Africa, e.g. in C Ghana, and S Benin in the rains; in Togo, in flocks in Jan-Apr but few in Sept-Dec. Recorded also in N Gabon. Vagrant in W Nigeria.

Status and Conservation. Not globally threatened. Uncommon to locally common, sometimes abundant. Readily uses bridges for nesting, and population may be increasing as a result.

Bibliography. Bannerman (1953), Barlow *et al.* (1997), Borrow & Demey (2001), Chapin (1953), Cheke & Walsh (1996), Christy & Clarke (1994), Dowsett (1989), Dowsett & Dowsett-Lemaire (1991, 1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Gatter (1988, 1997), Gore (1990), Grimes (1987), Keith *et al.* (1992), Lamarche (1988), Lippens & Wille (1976), Mackworth-Praed & Grant (1973), Schepers *et al.* (1998), Urban & Brown (1971), Walsh *et al.* (1990).

48. **Angolan Swallow**

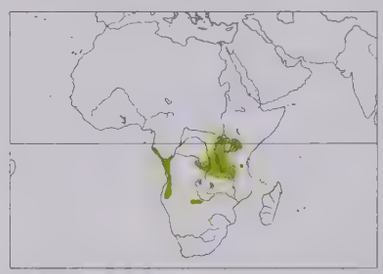
Hirundo angolensis

French: Hirondelle de l'Angola **German**: Angolaschwalbe **Spanish**: Golondrina Angoleña

Taxonomy. *Hirundo angolensis* Bocage, 1868, Huíla, Angola.

Forms a superspecies with *H. rustica*, *H. lucida*, *H. tahitica*, *H. neoxena*, *H. albigularis* and *H. aethiopica*; has been considered conspecific with *H. lucida*. E African birds described as race *arcticincta*, tending to be paler below and to have deeper tail-fork, but differences not constant and biometrics intergrade with those of adjacent populations. Monotypic.

Distribution. W Gabon, S PRCongo and W Angola; C, NE & E DRCongo, Uganda and W Kenya S to N & NW Zambia, N, W & E Tanzania and N Malawi; and NE Namibia (Caprivi Strip).



Descriptive notes. 15 cm; 16-19 g. Has forehead deep rufous-chestnut, crown and upperparts glossy steel-blue; wings and tail black, tail moderately forked, large white patches on inner webs of rectrices (except central pair); throat and upper breast deep rufous-chestnut, narrow blue breastband restricted or broken in centre, rest of underparts ashy-brown, undertail-coverts and underwing-coverts darker. Distinguished from *H. rustica* and *H. lucida* by brownish underparts. Female has shorter tail than male. Juvenile is duller, with rufous areas paler, short tail. VOICE. Song is a weak twittering.

Habitat. Open country, grassland, cultivation, swamp and forest edge, clearings, and human habitations. Mainly lowlands; to 2600 m in E Africa.

Food and Feeding. Diet includes flies (Diptera), mayflies (Ephemeroptera), Hymenoptera and beetles (Coleoptera). Feeds alone, in pairs or in small groups, at low or medium heights; flight slow compared with that of *H. rustica*.

Breeding. May and Sept in Gabon, May and Aug-Sept in Angola, Jan-Jul and Oct-Dec in Uganda, May in Kenya, Nov-Feb in Tanzania, Mar-May, Aug, Oct and Dec in DRCongo, May-Dec in Zambia and Oct-Dec in Malawi; may have up to three broods. Solitary or in groups (e.g. once c. 150 nests on building); 21 nests were up to 30 m apart. Nest an open cup made of mud pellets mixed with grass, lined with dry grass and feathers, placed 3·5-6 m above ground under overhang on bank, cliff, rock, in cave, on bridge, on verandah, or under eaves of building. Clutch 2-4 eggs, usually 3; incubation period 17-18 days; fledging period 22-27 days, usually 23 days; fledglings return to nest to roost for 3 weeks or more. In study in Uganda, 69% of eggs hatched, with 62% of eggs laid and 90% of eggs hatched producing fledglings (respective averages of 2 nestlings and 1·8 fledglings per nest); of 17 nests, four fledged no young.

Movements. Mainly resident; migratory in some areas, e.g. mostly absent in Zambia Dec-Mar. Forms flocks of up to 500 after breeding.

Status and Conservation. Not globally threatened. Rare to locally common. Uncommon in W of range; in E, commoner W of Rift Valley than E of it, but locally common in E Tanzania. Nests mainly in natural sites, but may be increasing its use of artificial ones; range possibly expanded relatively recently N into Gabon.

Bibliography. Aspinwall (1982), Aspinwall & Beel (1998), Benson & Benson (1977), Benson *et al.* (1971), Bijnens & Upoki (1992), Borrow & Demey (2001), Britton (1980), Brown & Britton (1980), Butynski (1994), Byaruhanga *et al.* (2001), Dean (1974, 2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Friedman & Williams (1969), Ginn *et al.* (1989), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Madge (1972), Newman (1996), Newman *et al.* (1992), Rand *et al.* (1959), Short *et al.* (1990), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

49. **Pacific Swallow**

Hirundo tahitica

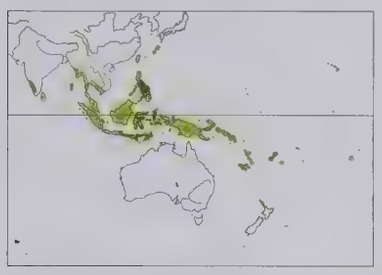
French: Hirondelle de Tahiti **German**: Südseeschwalbe **Spanish**: Golondrina del Pacífico
Other common names: House/Eastern/Coast Swallow; Eastern House Swallow (*tahitica*); Hill Swallow, Nilgiri House Swallow (*domicola*); Small House Swallow (*javanica*)

Taxonomy. *Hirundo tahitica* J. F. Gmelin, 1789, Tahiti.

Forms a superspecies with *H. rustica*, *H. lucida*, *H. angolensis*, *H. neoxena*, *H. albigularis* and *H. aethiopica*; sometimes treated as conspecific with *H. neoxena*, but differs morphologically (especially in bill size and in tail structure and markings). Sometimes split into two species, based on E "nominate group" (also including *ambiens* and *subfusca*) and paler W "*javanica* group", but racial variation is clinal throughout; the groups meet in W Melanesia, where birds in New Britain (*ambiens*) are intermediate between the two, and individuals on Long I (in S Bismarck Sea) appear intermediate between New Britain and N New Guinea populations. Further, race *domicola* has been considered a separate species by some, in part because of its geographical isolation from other races and its greenish, rather than blue, gloss; taxonomic status requires review. Race *frontalis* not well differentiated, also has been thought to include individuals from Wallacea, but they probably belong with *javanica*; birds from Philippines and Borneo (and sometimes those W to Malay Peninsula and S to Sumatra) intergrade with latter, and generally indistinguishable from it, but sometimes treated as a separate race *abbotti* (with which *mallopega* from N Philippines synonymized). Eight subspecies recognized.

Subspecies and Distribution.

H. t. domicola Jerdon, 1844 - S India and Sri Lanka.
H. t. javanica Sparrman, 1789 - Andaman Is, and from coastal Myanmar, S Thailand, S Cambodia and Cochinchina S to Sundas and Wallacea and E to Philippines.
H. t. namiyei (Stejneger, 1887) - Ryukyu Is (Nansei-shoto) and Taiwan.
H. t. frontalis Quoy & Gaimard, 1830 - N & W New Guinea.
H. t. albescens Schodde & Mason, 1999 - S & E New Guinea.
H. t. ambiens Mayr, 1934 - New Britain, in Bismarck Archipelago.
H. t. subfusca Gould, 1856 - New Ireland E through Solomons, New Caledonia and Vanuatu to Fiji and Tonga.
H. t. tahitica J. F. Gmelin, 1789 - Society Is (Moorea, Tahiti).



Descriptive notes. 13 cm; 11-16 g. Nominate race has forehead rufous-chestnut, crown and upperparts glossy steel-blue; wings and tail brownish-black, tail slightly forked, pale margins on inner webs of rectrices (except inner two pairs); throat rufous-chestnut, rest of underparts brownish-black, undertail-coverts grey-brown with dark subterminal band and pale tips. Distinguished from *H. neoxena* by darker underparts, pale margins (not spots) on rectrices, shorter outer tail feathers; from *H. rustica* by darker underparts, lack of breast-band, shorter tail. Sexes alike. Juvenile is duller, rufous areas paler, short tail. Races differ in shade of underparts, colour of upperparts and amount of white in tail, E races dark below with no tail spots, W races pale with white spots on inner webs of rectrices: *domicola* has green gloss above, ash-grey below, with white tail spots; *javanica* is purple-blue above, pale ash-brown with dark streaks below, large tail spots; *namiyei* is blue above, smoky brown below, with tail spots; *frontalis* differs from previous in being blue-black above, more grey below; *albescens* is paler ventrally, with larger tail spots; *ambiens* is blue above, grey below, tail spots small or absent; *subfusca* is blue above, grey-brown below with dark brown feathers on centre of breast, no tail spots. Voice. Twittering song "twsit-twsit-twsit"; also a "titswee".

Habitat. Sea coasts, open country, forested hills, and human habitations, especially near water; from sea-level to 2400 m. Feeds over grassland, cultivation, forest rivers and roads.

Food and Feeding. Diet in Malaysia 60% Hymenoptera (mainly flying ants and Apocrita), also flies (Diptera), beetles (Coleoptera) and termites (Isoptera); took larger insects than did *H. rustica* in same area; fewer ants taken in Mar-Apr, and more large flies in May. Forages alone or in groups, of usually up to five individuals; at low levels, average height 11 m in forested areas, 14 m in open areas, often within 10 m of vegetation. Flight fast, with frequent turns and short glides.

Breeding. Mar-May in India, mainly Feb-May in Sri Lanka; Mar-May in Myanmar, Jan-Aug in Malay Peninsula; Jan-May in Ryukyu Is, Mar-May, Jul and Oct in Philippines, and mainly Dec-Jul in Borneo; Nov and Dec in Tahiti; often two broods (29% of pairs in Malaysian study). Solitary or in small loose groups, 1 m or more between nests; group of 35 pairs recorded in Malaysia and up to 40 in Ryukyus and Tahiti. Nest built by both sexes, a half-cup made of mud pellets, lined with dry grass, rootlets, lichens and feathers; close to overhang, often over water, on cliff, in cave, on tree stump, culvert, bridge, jetty or verandah, under eaves, or on rafter inside building; nest repaired and reused in successive years. Clutch 2-3 eggs in India, usually 3 (2-4) in Sri Lanka, average 3 in Malaysia (clutch size decreases during season), 3 in Philippines, 2-4 in Borneo and 1-2 in Tahiti; incubation by female (although male *domicola* reported to help), period 15-17 days, generally 16; chicks fed by both sexes, feeding rates highest in late morning and at dusk; fledging period c. 20 days, range 17-22 days; young return to nest at night for several days. Breeding success 38% in Malaysian study, with 54% hatching success. Recorded longevity 7 years.

Movements. Mainly resident; post-breeding movement to lower altitudes in India and Sri Lanka (*domicola*), and in Ryukyus (*namiyei*) may move between islands after breeding. Transients reported, e.g. from Lanyu I and Huoshao Tao (off Taiwan). Joins flocks with other hirundines after breeding.

Status and Conservation. Not globally threatened. Generally common, though typically rather local. Common in SE Asia and in Philippines. Often limited to cliffs along coast, but has taken advantage of artificial nest-sites, such as at hill stations in Malaysia, resulting in some range expansion to inland areas.

Bibliography. Ali (1969, 1996), Ali & Ripley (1987), Andrew (1992), van Balen (1999), Beehler *et al.* (1986), Brazil (1991), Bregulla (1992), Bryant (1983), Bryant & Bryant (1988), Bryant & Hails (1983), Chakravarthy & Tejasvi (1992), Coates (1990), Coates & Bishop (1997), Diamond (1972), Dickinson *et al.* (1991), Gilliard (1950), Grimmett *et al.* (1998), Hails (1984), Hails & Jarvis (1987), Harrison, J. (1999), Hawa (1985), Henry (1998), Hoffman (1998), Holmes & Burton (1987), Holyoak (1974), Holyoak & Thibault (1984), Isherwood *et al.* (1997), Jeyarajasingam & Pearson (1999), Jones, J.P.G. *et al.* (1998), Jones, M.J *et al.* (1994), Kennedy *et al.* (2000), King (1997), Kotagama (1985), Lekagul & Round (1991), MacKinnon & Phillipps (1993), Madoc (1976), van Marle & Voous (1988), Mayr (1944, 1955), Mayr & Diamond (2001), Mayr & Rand (1937), McClure (1998), McGregor (1905), Medway & Wells (1976), Mees (1965), Meyer (1934), Phillips (1950), Pratt *et al.* (1987), Rabor (1977), Rand & Gilliard (1967), Riley, J. (1997), Riley, J.H. (1938), Ripley (1982), Robson (2000), Schodde & Mason (1999), Smythies (1986, 1999), Thibault (1988), Vaurie (1951b), Wardill (1995), Watling (1982, 2001), Waugh & Hails (1983), White & Bruce (1986).

50. Welcome Swallow

Hirundo neoxena

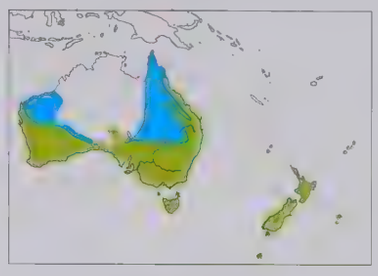
French: Hirondelle messagère **German**: Glücksschwalbe **Spanish**: Golondrina Australiana

Taxonomy. *Hirundo neoxena* Gould, 1843, Tasmania.

Forms a superspecies with *H. rustica*, *H. lucida*, *H. angolensis*, *H. tahitica*, *H. albigularis* and *H. aethiopica*; sometimes treated as conspecific with *H. tahitica*, but differs morphologically (especially in bill size and in tail structure and markings). Races poorly defined; tail length increases slightly from SE Australia W to Eyre Peninsula and decreases in W Australia, more so in males than in females. Proposed race *parsonsi* from NE Australia (E Queensland), supposedly with less white in tail, considered indistinguishable. Two subspecies recognized.

Subspecies and Distribution.

H. n. carteri (Mathews, 1912) - W Australia.
H. n. neoxena Gould, 1843 - SC & E Australia, Tasmania, Lord Howe I, Norfolk I, New Zealand (including Great Barrier I), Kermadec Is, Chatham Is and Auckland Is.



Descriptive notes. 13-17 cm; 12-17 g. Has forehead rufous-chestnut, crown and upperparts glossy steel-blue; wings and tail blackish-brown, tail deeply forked, white patch on inner webs of rectrices (except central pair); throat and upper breast rufous-chestnut, rest of underparts greyish-white, brown tinge on sides and underwing-coverts; undertail-coverts grey-brown, dark subterminally, with pale edges. Distinguished from *H. tahitica* by paler underparts, pale spots (rather than margins) on rectrices, longer outer tail feathers; from *H. rustica* by lack of blue band below throat. Female has shorter tail than male. Juvenile is duller and browner, rufous areas paler, tail shorter. Race *carteri* differs from nominate only in larger size. Voice. Song is a mixture of twittering and trills; contact call "seet" and a sharp alarm call "twsee", "sweert" or "tit-swee".

Habitat. Open country, coasts, cultivation and human habitations, often near water. Roosts in wetlands.

Food and Feeding. Diet includes flies (Diptera), Hymenoptera, beetles (Coleoptera), bugs (both heteropterans and homopterans), stoneflies (Plecoptera), Odonata, caddis flies (Trichoptera), Lepidoptera and springtails (Collembola). Forages alone or in small groups, low over ground; flight fast, with frequent turns. Follows other animals to take insects flushed by them. Recorded as feeding at night on moths attracted to lights, and on flies inside a building.

Breeding. Jul-Apr, peak Sept-Oct, earlier inland than on coast; Aug-Feb in New Zealand; 2-3 broods. Solitary, sometimes in loose groups, with nests 0·1-1 m apart in one study; records of 20-25 nests under jetty and 500 birds in deserted farmhouse; aggressive towards intruders. Male fans tail during courtship displays, follows female during nest-building; may copulate on perch near nest. Nest constructed by both sexes, taking 6-24 days, most activity in morning, a half-cup made of mud pellets mixed with grass, lined with dry grass, rootlets, hair, wool and feathers, sometimes feathers added during incubation; placed on vertical surface close to overhang, 0·3-7·6 m (average 2·6 m) above ground or 0·3-12 m (average 1·72 m) above water, mostly in artificial site such as culvert, bridge, jetty, mine shaft, water tank, verandah, rafter inside building or on wall or under eaves, usually on outside of building, less often on cliff, in cave or in hollow tree; also recorded on other sites such as moving boat, mailbox, *Petrochelidon ariel* nest; old nests repaired and reused. Clutch 2-7 eggs, usually 4 or 5; clutch size averaged 4·5 in New Zealand, 3·9 in Australia (of 380 Australian clutches, 61·3% were of 4 eggs, 17·9% of 3, 16·8% of 5, and 4% of 6, 2 or 1, the last possibly reduced by predation); incubation by female, but male has been recorded on eggs, and also, rarely, male seen to bring food to incubating mate, period 14-19 days, in one study average 15·6 days; eggs hatch mostly over 1-2 days, chicks fed by both sexes, rate 17-24 feeds per hour at a nest with four chicks; fledging period 18-23 days (average 20·6), longer in New Zealand (average 21·5 days) than in Australia (average 18·9); young fed near nest, and return to it to roost for a few days, sometimes up to c. 3 weeks, in one case while second clutch was laid and incubated. Average fledging success 74% and breeding success 53%; losses of eggs and chicks caused mainly by bad weather, nest competition from sparrows (*Passer*), predation, nest falls and disturbance. Oldest bird 6 years.

Movements. Resident and partial migrant; forms flocks after breeding, usually of up to 500 birds. Resident or partial migrant in W Australia and New Zealand; passage movements occur, e.g. in coastal Otago (S New Zealand), and flocks recorded outside breeding range, and in areas with few breeding birds, in non-breeding season, e.g. in Southland (S New Zealand). Partially migratory in E Australia; non-breeding visitor in N Australia, including Torres Strait, but also present in S, including Tasmania, in austral winter. Main passage movement Feb-Mar and Aug-Sept. Adults will return to same site to breed in successive years. Recent records also from New Guinea and New Caledonia and from other island groups.

Status and Conservation. Not globally threatened. Common. Has extended range outside Australia since late 1950s. First recorded in New Zealand in 1958, in Northland, and present throughout Northland by 1965; numbers and range have increased, both on South I and North I and on islands offshore. Expansion possibly continuing; non-breeding individuals also recorded in last few decades in New Guinea and New Caledonia, as well as on other island groups. Has benefited from presence of artificial nest-sites. Spread in breeding distribution appears to have followed expansion of farmland.

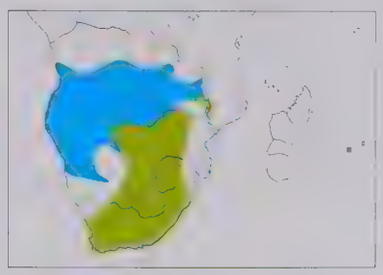
Bibliography. Ashton, C.B. (1986), Ashton, J.C. (2000), Ashton, J.C. & Armstrong (2002), Bailey & Sorensen (1962), Bishop & Bishop (1985), Blakers *et al.* (1984), Brock (1978), Broun & Broun (1970), Brown *et al.* (1990), Bull *et al.* (1985), Burbidge (1984), Campbell (1901), Chambers (2000), Child (1982), Claridge (1983), Coates (1990), Cowan (1968, 1971), Craig (1984), Crouchley & Crouchley (1979), Denninson (1974), Disney (1988, 1991), Drake (1985), Edgar (1962, 1966), Evans *et al.* (2003), Falla *et al.* (1981), Finch (1980, 1984), Findlay *et al.* (1960), Flux & Wilson (1965), Gregory (1978), Hall & Sibson (1960), Hamilton (1981), Hankins (1963), Heather (1956), Heather & Robertson (1997), Henderson (1964), Hermes (1985), Hobbs (1966), Hollay (1971), Hughes (1973), Jenkins (1978), Kinsky (1970), Klapste & Klapste (1985), Latham (1981), Lovegrove (1970), Macdonald (1988), Marchant & Fullagar (1983), McKnight & McKnight (1991), Michie (1959a, 1959b), Moon (1992), Moon & Lockley (1982), Morcombe (2000), Morrison (1987), Munro (1969, 1973), Norris (1968), Park (1981a, 1981b), Pizzey & Knight (1997), Reilly *et al.* (1975), Robertson (1985), Ross (1962), Ross & Shanks (1960), Salter (1960), Sansom (1954), Saunders & de Rebeira (1985), Scarlett (1968), Schodde & Mason (1999), Schodde *et al.* (1983), Schrader (1976), Semmens (1993), Serventy (1958), Serventy & Whittell (1962), Simpson & Day (1998), Skegg (1962), Slater *et al.* (1989), Soper (1976), Storr (1965), Syms (1978), Tarburton (1986, 1993), Thomas (1966), Tunnicliffe (1968), Turbott (1965), Watson (1955), Watts (1999), Wood (1973), Wright (1964).

51. White-throated Swallow

Hirundo albigularis

French: Hirondelle à gorge blanche **Spanish**: Golondrina Gorgiblanca
German: Weißkehlschwalbe

Taxonomy. *Hirundo albigularis* Strickland, 1849, Cape Peninsula, South Africa.
Forms a superspecies with *H. rustica*, *H. lucida*, *H. angolensis*, *H. tahitica*, *H. neoxena* and *H. aethiopica*. Birds in N of range sometimes separated as race *ambigua* on basis of smaller wings and tail, but variation clinal. Monotypic.
Distribution. Botswana and Zimbabwe E to S Malawi and S to S South Africa (except NW); has bred Zambia and Namibia (possibly regular); single breeding report from C Angola requires confirmation. In non-breeding season also N to NC Angola and SE DRCongo and W to Namibian coast.



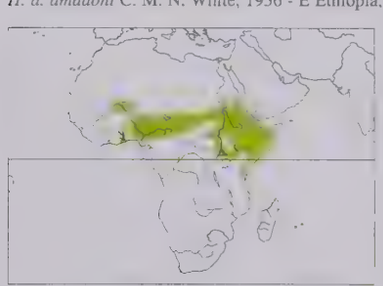
Descriptive notes. 14-17 cm; 16-29 g. Has rufous-chestnut forehead, glossy steel-blue crown and upperparts; wings brownish-black; tail blue-black, deeply forked, white patch on inner webs of rectrices (except central pair); underparts greyish-white, pure white on throat, with steel-blue breastband which tapers in centre; underwing-coverts white. Distinguished from similar *H. rustica*, *H. lucida* and *H. angolensis* by white throat, from *H. dimidiata* by breastband and chestnut forehead. Female has shorter tail than male. Juvenile is duller, with paler forehead and brown breastband. Voice. Song is a rapid twittering; calls include a sharp "chit" and nasal and squeaking notes.
Habitat. Grassland, open woodland, floodplains and human habitations, often near water.
Food and Feeding. Diet includes flies (Diptera), beetles (Coleoptera) and Hymenoptera. Forages alone, in pairs or in small groups, often low over the ground; mixes with other swallows. Flight rapid, with frequent banking and turning. Will hawk for insects from a perch and feed around other animals; occasionally feeds from ground.
Breeding. Generally Aug/Sept-Apr, with peak Oct-Dec; may have two or more broods. Solitary. Nest an open cup made of mud pellets, lined with rootlets, hair, dry grass and feathers, usually affixed under overhang, often above water, on rock face, culvert, dam, water tank, under bridge, on verandah, beneath eaves or ceiling, or in outbuilding; sites reused, but subsequent broods often reared in different nest. Clutch 2-5 eggs, normally 3; incubation 15-16 days; chicks fed by both sexes, fledging period 20-21 days; young return to nest for 12 or more days. Oldest bird 9 years 11 months.
Movements. Mostly migratory. Forms post-breeding flocks of up to 1000 individuals. Most migrate to areas N of R Zambezi, where present mainly from late May/early Jun to late Sept/Oct; returns to same nest-site. Mainly a passage migrant in Botswana, with peaks of movement Aug-Oct and Mar-Apr. Recorded in non-breeding season throughout range, most frequently in N, e.g. Zimbabwe. Vagrants recorded in N PRCongo and N Tanzania; report from Cameroon considered unacceptable.
Status and Conservation. Not globally threatened. Generally common, but local; in South Africa most abundant in wet E areas and in SW Cape. Marginal in Mozambique; breeds in Chimanimani Mts on border with Zimbabwe (but no recent records on Mozambique side), and reported from extreme W of Tete province probably as a passage migrant; earlier records from near Beira considered dubious. Extent of breeding distribution unclear, requires further study. Readily nests on bridges and dams, and probably extended its range during 20th century.
Bibliography. Aspinwall (1979b), Aspinwall & Beel (1998), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Britton (1980), Clancey (1964b, 1996), Dean (2000), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Earlé (1987d, 1988b), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Hockey (1996), Hockey *et al.* (1989), Irwin (1981), Jackson (1973), Jensen (1962), Keith *et al.* (1992), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Medland (1989b, 1989c), Newman (1996), Newman *et al.* (1992), Oatley (2003), Penry (1994), Pollard (2001), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Stevenson & Fanshawe (2002), Tarboton (2001), Tyler & Borello (1998), Vernon & Dean (1988), Zimmerman *et al.* (1996).

52. Ethiopian Swallow

Hirundo aethiopica

French: Hirondelle d'Éthiopie **German**: Fahlkehlschwalbe **Spanish**: Golondrina Etiópica

Taxonomy. *Hirundo aethiopica* Blanford, 1869, Barakit, Tigray, north Ethiopia.
Forms a superspecies with *H. rustica*, *H. lucida*, *H. angolensis*, *H. tahitica*, *H. neoxena* and *H. albigularis*. Birds from W Africa E to Sudan sometimes separated as race *fulvipectus* on basis of more buffy throat and breast, but probably indistinguishable from nominate. Two subspecies recognized.
Subspecies and Distribution.
H. a. aethiopica Blanford, 1869 - Senegambia, Guinea, Ivory Coast, Ghana, Togo, Benin, and from E Mali, N Burkina Faso, S Niger and C Chad S to N Cameroon and N Central African Republic and E to C & SE Sudan, W Ethiopia, N Uganda, N & SE Kenya and NE Tanzania.
H. a. amadoni C. M. N. White, 1956 - E Ethiopia, Somalia and NE Kenya.



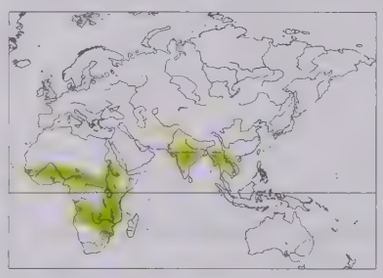
Descriptive notes. 13 cm; 10-17 g. Nominate race has forehead rufous-chestnut, crown and upperparts glossy steel-blue; wings black; tail blue-black, deeply forked, with small white patches on inner webs of feathers (except central pair); throat and upper breast buffy white, incomplete steel-blue breastband, rest of underparts white to whitish. Differs from *H. lucida* in paler throat and breast. Sexes alike. Juvenile is duller and browner than adult. Race *amadoni* has whiter throat and breast. Voice. Song is a melodious twittering; calls are "cheep-cheep", "chip" and "cheut".
Habitat. Variety of open areas, including arid savanna and other grassland, open woodland, forest clearings, coastal cliffs; also human habitations, including towns. Lowlands and higher, to c. 2700 m in Ethiopia.
Food and Feeding. Diet includes flies (Diptera), Hymenoptera (including bees and flying ants), termites (Isoptera) and cicadas (Cicadidae). Feeds in pairs or small groups, often very low over ground; flight fast, with few glides. Will take non-flying insects from walls.
Breeding. Mar, Jul-Aug and Dec-Jan in Senegambia, Dec-Jan in Guinea, Apr-Jun in Ghana, Aug in Benin and Niger, Mar-Aug in Nigeria, Jul-Nov in Chad, Mar-Jul in Sudan, Apr-Oct in Ethiopia; mainly Mar-Jun and Dec in E Africa; may have two broods, occasionally three. Solitary or in loose groups. Nest built by both sexes, taking c. 2 weeks, an open cup made of mud pellets and dry grass and rootlets, lined with dry grass, rootlets, hair and feathers (coconut and palm-leaf fibres also recorded), sometimes nest of other swallow or of swift (Apodidae) used as base; affixed below e.g. eaves, overhang or beam, or (rarely) supported from below, on or in hut, house, stable, verandah or other building, or on bridge, less often in cave or coral overhang; nests reused. Clutch 2-4 eggs, usually 3; incubation probably mostly by female, c. 14 days; chicks fed by both sexes, fledging 25 days; young roost in or near nest for further week. Some nestling mortality from disease and/or parasites. Oldest recorded bird 7 years.
Movements. Mainly resident, but migratory or partially migratory in some areas. Forms post-breeding flocks of up to 500 individuals, roosts of up to 3000. Some resident in Ghana, with influx in rains; present in rains in Mar-Jul in N Ghana, Feb-Nov in SE Nigeria, May-Jul in Sudan; absent in Chad in Dec-Mar dry season. Mainly resident in E Africa; most abundant in Apr-May in Ethiopia. Vagrant in Israel.
Status and Conservation. Not globally threatened. Generally widespread, common and locally abundant; especially numerous in and around towns. Range has been expanding W in W Africa and S in E Africa since latter part of 20th century; scarce in Kenya and unknown in Uganda in early 20th century. Extension facilitated by its frequent use of artificial nest-sites. Suffers nest-site competition from Little and White-rumped Swifts (*Apus affinis* and *A. caffer*) and from *Cecropis abyssinica*.
Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Bannerman (1939, 1953), Bear (1991), Borrow & Demey (2001), Britton (1980), Brown & Britton (1980), Byaruhanga *et al.* (2001), Cheke & Walsh (1996), Clarke (1985), Demey & Fishpool (1991), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Grant & Lewis (1984), Grimes (1987), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1973), Morel & Morel (1990), Mulai (1999), Nikolaus (1987), Rydzewski (1978), Salvan (1969), Serle (1950a), Short *et al.* (1990), Stevenson & Fanshawe (2002), Thiollay (1985), Urban & Brown (1971), Zimmerman *et al.* (1996).

53. Wire-tailed Swallow

Hirundo smithii

French: Hirondelle à longs brins **German**: Rotkappenschwalbe **Spanish**: Golondrina Colilarga
Other common names: African Wire-tailed Swallow (*smithii*); Asian Wire-tailed Swallow (*filifera*)

Taxonomy. *Hirundo Smithii* Leach, 1818, Chisalla Island, Democratic Republic of Congo.
Sometimes considered to form a superspecies with *H. nigrita*, but substantial plumage and other morphological differences, combined with extent of range overlap in Africa (Congo Basin), make this unlikely. Two subspecies recognized.
Subspecies and Distribution.
H. s. smithii Leach, 1818 - sub-Saharan Africa from Senegal, S Mali and C Ivory Coast E to C & S Sudan, Ethiopia and Somalia, and S (outside C rainforest zone) to N Namibia, N Botswana and NE South Africa.
H. s. filifera Stephens, 1826 - S Uzbekistan, S Tadjikistan, Afghanistan, Pakistan, India, SW Nepal, Myanmar, N Thailand, Laos, Cambodia and C Vietnam.



Descriptive notes. 14-21 cm; 9-17 g. Distinctive. Has forehead and crown rufous-chestnut, upperparts glossy blue; wings and tail black with blue gloss, white patches on inner webs of rectrices (except central pair), outer tail feathers elongated to form thin filaments (difficult to see in the field); creamy white below, blue patch on each side of breast and on flanks. Female has shorter tail than male. Juvenile is duller, crown paler, tail shorter. Race *filifera* is larger than nominate. Voice. Twittering song "chirrickweet chirrickweet"; calls include a "chit-chit" uttered in flight and at a nest with young, a "chichip chichip" alarm call, and "twit", "pwee" and "che".
Habitat. Grassland, savanna, open woodland, clearings, cultivation, also human habitations, including towns; usually near water, such as lakes, rivers, canals and paddyfields. Mostly middle to low altitudes, below 2000 m, but up to c. 2700 m. Roosts in reedbeds and tamarisks (*Tamarix*).
Food and Feeding. Diet includes flies (Diptera), beetles (Coleoptera), bugs (Hemiptera), butterflies and moths (Lepidoptera), mayflies (Ephemeroptera), Hymenoptera and termites (Isoptera). Forages in pairs or small groups, mixes with other swallows and swifts (Apodidae). Feeds often low down (4-5 m high), and predominantly over water, but also over open ground and above trees. Flight fast. Occasionally perches on ground to take insects, and follows tractors and large animals.
Breeding. Generally two peaks, at start of rains, e.g. Jan-May and Jul-Dec in Senegal, all year (peaks Jan-Mar and Jul-Aug) in Gambia, Oct-May in Nigeria, Feb-Apr, Sept and Nov in Sudan, Jan, Mar-May and Aug-Nov in Ethiopia, all year (peaks Apr-May and Oct) in E Africa, Jun-Jul and Oct in Angola, Jan-Oct in Zambia, all months (peaks Mar and Sept-Oct) in Zimbabwe, mainly Mar-Apr and Sept-Oct in E South Africa, Apr-May and Oct-Nov in KwaZulu-Natal; Feb-Sept, varying locally, in Indian Subcontinent, and Jan-Nov in SE Asia; may have 2-3 broods. Solitary, occasionally a few pairs at same site but nests not usually clustered; aggressive towards other hirundines. Nest constructed by both sexes, taking c. 1 week, an open cup made of mud or of mud mixed with dry grass, lined with grass, rootlets and feathers, sometimes built on old nest of other swallow; 30 cm to 15 m above ground, usually affixed on wall, rafter, under overhang or close to a ceiling, in house, verandah, on culvert, bridge, pier, boathouse, boat, water tower, less often on cliff, in cave, on rock, or on tree overhanging water, and often along or near river, stream, lake, even irrigation channel or rice field; nests reused. Clutch 2-4 eggs (usually 3) in Africa, usually 3 in Pakistan, 3-5 in India, 3-4 in SE Asia; incubation by female, 13-19 days, mostly 14-15; chicks fed by both sexes, older ones more by female than by male, up to 16 feeds per hour, fledging period 15-24 days, usually 18-21 days; young return to nest for several days. Nests sometimes taken over by White-rumped Swift (*Apus caffer*). Oldest recorded bird 9 years 6 months.
Movements. In Africa, resident near nest-site in some areas, e.g. in Gambia, Central African Republic and W Nigeria, but absent in some months in E Nigeria, Benin, Burkina Faso, Ghana and Gabon; partial migrant, present mainly Mar/Apr-Oct, in C & S Africa, but some present all year and numbers vary seasonally. Occasionally reported farther afield, e.g. Egypt. In Asia, breeding visitor in N part of range, spending non-breeding season farther S; generally resident in S, but sometimes some local post-breeding movements. Recorded in NW & NE India, Bangladesh and Sri Lanka.
Status and Conservation. Not globally threatened. Varies from uncommon to locally abundant. Uncommon in W Africa, common and more widespread in E, common to locally very common in

S; common to uncommon and local in Indian Subcontinent; scarce to uncommon, locally more common, in SE Asia. The most numerous swallow in cultivated areas in much of range. Frequent use of artificial nest-sites, and construction of new bridges and buildings, have allowed it to spread during the last 100 years or so. Range has probably extended to W & SW in S Africa, and also on to Mashonaland Plateau and Chipinga Uplands in Zimbabwe; in W Africa, not recorded in Gambia until 1960s, but now regularly reported as breeding on artificial sites; expansion into Gabon and Cameroon probably also fairly recent. Some competition for artificial sites from House Sparrows (*Passer domesticus*).

Bibliography. Ali (1996), Ali & Ripley (1987), Aspinwall (1980c), Bannerman (1939, 1953), Barlow *et al.* (1997), Beesley (1972), Benson & Benson (1977), Benson *et al.* (1971), Betts (1952), Borrow & Demey (2001), Brooke (1958), Byaruhanga *et al.* (2001), Cheke & Walsh (1996), Clancey (1964b), Dean (2000), Dementiev *et al.* (1968), Dowsett & Dowsett-Lemaire (1991, 1993), Dowsett & Forbes-Watson (1993), Duckworth *et al.* (1999), Earlé (1988a), Elgood *et al.* (1994), Fuggles-Couchman (1939), George (1959), Ginn *et al.* (1989), Gore (1990), Grimes (1987), Grimmett *et al.* (1998), Hanmer (1976, 1989), Harrison *et al.* (1997), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Irwin (1981), Keith *et al.* (1992), Knystautas (1993), Lekagul & Round (1991), Lewis & Pomeroy (1989), Macdonald (1984), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Medland (1992b), Moreau (1939b), Moreau & Moreau (1940), Mukherjee (1995), Newman *et al.* (1992), Nikolaus (1987), Nyandoro (1987), Pakenham (1979), Penry (1994), Ripley (1982), Roberts (1992), Robson (2000), Rosier (1996), Scott (1896), Shaw (1979), Short *et al.* (1990), Sinclair & Hockey (1996), Smythies (1986), Sørensen *et al.* (1996), Stepanyan (1990), Stevenson & Fanshawe (2002), Tarboton (2001), Thiollay (1985), Urban & Brown (1971), Vaurie (1959), Waugh (1978), Zimmerman *et al.* (1996).

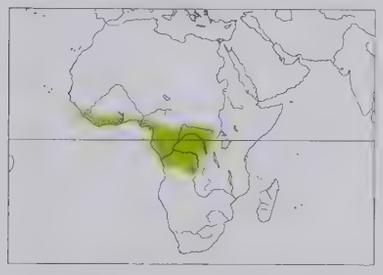
54. White-throated Blue Swallow

Hirundo nigrita

French: Hirondelle à bavette **German**: Mohrenschwalbe **Spanish**: Golondrina Negrita
Other common names: Little Blue Swallow, West African/White-chinned Swallow

Taxonomy. *Hirundo nigrita* G. R. Gray, 1845, no locality = River Niger, West Africa.
Sometimes considered to form a superspecies with *H. smithii*, but substantial plumage and other morphological differences, combined with extent of range overlap in Africa (Congo Basin), make this unlikely. Monotypic.

Distribution. Sierra Leone, SE Guinea, Liberia, and S parts of Ivory Coast, Ghana, Benin and Nigeria, E to SW Central African Republic and DRCongo (except NE & SE) and S to NW & NE Angola (S to Cuanza Norte, Malanje and Lunda Sul); possibly also extreme W Uganda (R Semliki).



Descriptive notes. 12 cm; 15-22 g. Plumage is mostly glossy steel-blue with purple sheen, white patch on throat; wings black with purple gloss; tail almost square, black with blue gloss, white patches on inner webs of feathers (except central pair); blackish underwing-coverts. Sexes alike. Juvenile is duller and browner than adult. VOICE. Song is a weak twittering; calls include a "weetch", a "vwhit vwhit" and a soft "whit" uttered in flight.

Habitat. Rivers and streams in rainforest; also mangroves, harbours, land spits and lagoons.

Food and Feeding. Diet includes dipterans, especially horseflies (Tabanidae), also beetles (Coleoptera), Odonata, termites (Isoptera), Hymenoptera. Forages mostly in pairs, occasionally in small groups, once of over 40 individuals. Flight rapid, with frequent banking, occasional gliding. Sometimes hawks insects from riverbank perch or from rock or overhanging branch.

Breeding. Mainly in dry season, when river levels low: Mar in Sierra Leone, Oct-Mar in Liberia, Jan and Jun in Ghana, Jan-Feb and Aug in Nigeria, Jan-Feb and Jun in Cameroon, Jan-Mar and Jun-Aug in Gabon, Jan-Feb, Jul and Dec in DRCongo, and Mar-Apr and Aug in Angola; sometimes double-brooded. Solitary; aggressive towards intruders, pair keeps to limited area around nest-site. Nest built by both sexes, taking c. 3 weeks, an open cup made of mud pellets with some dry grass, lined with bark, grass and feathers, usually affixed under horizontal surface and generally 1-3 m (sometimes as little as 10 cm) above water and more than 5 m from riverbank, on rock, fallen tree or overhanging branch or cliff, but also recorded on artificial site such as bridge, pier, upturned canoe, or roof of house near water; nests sometimes reused. Clutch 2-3 eggs, rarely 4; incubation by female, 15 days or more; chicks fed by both sexes, fledge at 17-18 days; family-members stay together for a while.

Movements. Resident; possibly some local movements. Apparently present in Sierra Leone only Dec-Jul.

Status and Conservation. Not globally threatened. Locally common. Recorded density 1-2 nests/km of river. Recently recorded on Ugandan side of R Semliki, but not known if breeding there. Only occasionally exploits artificial nest-sites, but this habit (especially use of bridges) may be increasing.

Bibliography. Allport *et al.* (1989), Ash *et al.* (1991), Bannerman (1953), Borrow & Demey (2001), Brosset & Érard (1986), Cheke & Walsh (1996), Colston & Curry-Lindahl (1986), Dean (1974, 2000), Dowsett (1989), Dowsett & Dowsett-Lemaire (1991, 1993, 1997), Dowsett & Forbes-Watson (1993), Dutson & Branscombe (1990), Fishpool & Evans (2001), Gartshore (1989), Gartshore *et al.* (1995), Gatter (1988, 1997), Germain *et al.* (1973), Grimes (1987), Harding & Harding (1982), Holman (1947), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1973), Prigogine (1980), Rand (1951), Serle (1949, 1950b, 1954), Stevenson & Fanshawe (2002), Thiollay (1985), Young (1946).

55. Pied-winged Swallow

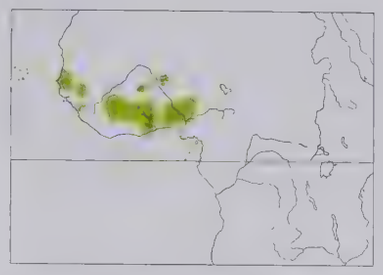
Hirundo leucosoma

French: Hirondelle à ailes tachetées **Spanish**: Golondrina Alipinta
German: Scheckflügelschwalbe

Taxonomy. *Hirundo leucosoma* Swainson, 1837, West Africa.
In the past was sometimes placed with *H. megaensis* and *H. dimidiata* in a separate genus *Hemicecrops*, and has been thought by some authors to form a superspecies with those. Monotypic.

Distribution. Senegambia, N Guinea, NW Sierra Leone, S Mali, Burkina Faso, SW Niger, and N Ivory Coast and Ghana E to C Nigeria.

Descriptive notes. 12 cm. Distinctive. Has forehead to hindneck and upperparts glossy steel-blue, large white patches on inner greater upperwing-coverts, inner secondaries and tertials; tail slightly forked, black with blue-green gloss, white patches on inner webs of feathers (except central pair)



increasing in size outwards; throat and underparts white, blue patch on side of breast. Female has shorter tail than male. Juvenile is duller than adult, head browner, tail shorter. VOICE. Not very vocal; "chut" contact call.

Habitat. Wooded savanna, forest clearings and rivers; also around human habitations, including towns.

Food and Feeding. Details of diet not known. Feeds alone or in pairs, occasionally in small groups; also associates with other hirundines. Forages low down, over open grassland and around trees; flight buoyant and fast, with frequent turning and banking.

Breeding. Apr/May-Jun. Solitary. Nest built by both sexes, taking 15-30 days, a shallow open cup made of mud, lined with dry grass and other fibres; mainly on building and affixed to support such as projection from wall, rafter, or the junction of wall and roof, one nest 4·6 m down in a well, another 6 m up on a water tower; sometimes near *Cecropis semirufa*; nest reused in successive years. Clutch 4 eggs recorded; no other information.

Movements. May be resident with some post-breeding movements in some areas; partial migrant in others. In some areas recorded only (or mainly) during certain part of the year, e.g. Dec and Apr in Senegal, Nov-Apr in Niger, in rains in Ghana and N Nigeria, and Feb-Apr and Jul-Sept in Togo. Reported as vagrant in W Cameroon.

Status and Conservation. Not globally threatened. Generally scarce to uncommon, sometimes locally common. Distribution irregular. Has possibly benefited locally from its extensive use of buildings as nest-sites.

Bibliography. Bannerman (1939, 1953), Barlow *et al.* (1997), Borrow & Demey (2001), Cheke & Walsh (1996), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Fry (1980), Gore (1990), Grimes (1987), Holman (1947), Jensen & Kirkeby (1980), Keith *et al.* (1992), Louette (1981), Mackworth-Praed & Grant (1973), Morel & Morel (1990), Schepers *et al.* (1998), Traylor & Parelius (1967).

56. White-tailed Swallow

Hirundo megaensis

French: Hirondelle à queue blanche **Spanish**: Golondrina Coliblanca
German: Weißschwanzschwalbe

Taxonomy. *Hirundo megaensis* Benson, 1942, 10 miles [16 km] west of Mega, 4000 feet [c. 1220 m], Ethiopia.
In the past was sometimes placed with *H. leucosoma* and *H. dimidiata* in a separate genus *Hemicecrops*, and these three have been considered by some authors to form a superspecies. Monotypic.

Distribution. S Ethiopia (Yavello and Mega areas, in Sidamo Province).



Descriptive notes. 13 cm; 11 g. Male is glossy steel-blue above, wings black with blue sheen; tail slightly forked, inner feathers all white with black shaft streaks, outer feathers white on inner webs; throat and underparts white. Differs from *H. aethiopica* in blue (not rufous) forehead, whiter throat and breast without breastband, shorter tail with much more white. Female is less glossy than male, has shorter tail with less white. Juvenile is duller, with pale fringes on flight-feathers, tertials and uppertail-coverts and tail feathers. VOICE. Unknown.

Habitat. Open, semi-arid grassland with acacia (*Acacia*) bushes, also *Acacia* woodland, and villages. Mainly 1500-1700 m, sometimes down to 990 m and up to 2400 m.

Food and Feeding. Diet includes beetles (Coleoptera). Forages around flowering trees; flight fast and elegant.

Breeding. Main rainy season in Apr-Jun, but suspected of breeding also in period Jan-Feb. Nest is an open cup, placed typically on roof pole in village hut or on wall of well, possibly also in termitarium and on culvert. One nest contained 3 eggs, and another held 4 chicks; no other information available.

Movements. Resident; possibly some local movements, as numbers vary.

Status and Conservation. VULNERABLE. Restricted-range species: present in South Ethiopian Highlands EBA. Population estimated to be in range 2500-10,000 individuals, but data poor. Although frequently seen, it occurs within small area of only c. 14,900 km^2. One survey in 1980s suggested a stable population, and another reported lower numbers but over a larger range; in a 1996 survey, found to be fairly common but occurring in small numbers. Threatened by clearance of vegetation for livestock grazing. Yavello Sanctuary was designated in 1985, in part to protect this species, but this reserve is not yet gazetted or managed. Conservation targets are to determine this hirundine's habitat requirements and the reasons why it has such a restricted range, and to ascertain the effects of scrub clearance on the population.

Bibliography. Ash & Gullick (1989), Benson (1942, 1946b), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Francis & Shirihai (1999), Hillman (1993), Holtam (1998), Keith *et al.* (1992), Mackworth-Praed & Grant (1960), Mohamued *et al.* (1992), Shirihai & Francis (1999), Shuker (1993), Stattersfield & Capper (2000), Syvertsen & Dellelegn (1991), Tilahun *et al.* (1996), Urban (1980), Urban & Brown (1971).

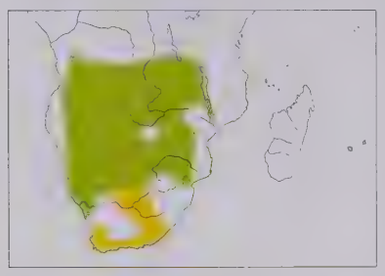
57. Pearl-breasted Swallow

Hirundo dimidiata

French: Hirondelle à gorge perlée **German**: Perlbrustschwalbe **Spanish**: Golondrina Perlada

Taxonomy. *Hirundo dimidiata* Sundevall, 1850, Leroma, Transvaal, South Africa.
In the past was sometimes placed with *H. leucosoma* and *H. megaensis* in a separate genus *Hemicecrops*, and has been thought by some authors to form a superspecies with those. Races poorly differentiated. Two subspecies recognized.

Subspecies and Distribution.
H. d. marwitzi Reichenow, 1903 - Angola, S DRCongo, Zambia, Malawi, Zimbabwe, NE South Africa and W Mozambique.
H. d. dimidiata Sundevall, 1850 - Namibia and Botswana S to the Cape.

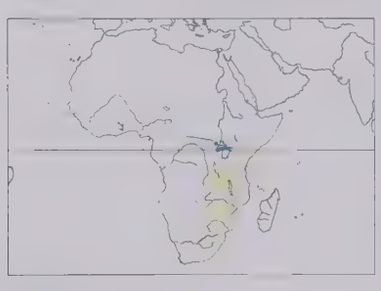


Descriptive notes. 13 cm; 10-15 g. Male is glossy blue above, wings blackish with slight blue gloss; tail slightly forked, blackish, usually without any white; grey-white below, grey wash on breast, dark tips of undertail-coverts. Distinguished from *Delichon urbicum* and *Pseudhirundo griseopyga* by lack of pale rump. Female has shorter tail and greener gloss than male. Juvenile is duller, with white tips to inner secondaries, shorter tail. Race *marwitzi* is smaller and darker than nominate. VOICE. Song is a harsh "chip-cheree-chip-chip"; also a courtship call "kss-kss", "twit" calls uttered in flight and a "chik", "chut" and "chuchut".
Habitat. Grassland, scrub, broadleaf woodland, miombo woodland edge and clearings, cultivation, and human habitations, often near water; also seen over swampy ground.
Food and Feeding. Details of diet not known. Forages alone, in pairs or in small groups, occasionally in flocks of up to 100. Feeds, probably on flies, around livestock and other animals; flies fast, often low down. Often perches on ground or stones.
Breeding. Aug-Oct in DRCongo, Aug-Sept in Zambia and Malawi, Sept in Mozambique, Oct-Jan in Namibia, Aug-Feb in Zimbabwe; Aug-Mar (mainly Aug-Oct) in E South Africa, but Aug-Apr (peak Oct-Dec) in the Cape; usually two broods, sometimes three in S. Solitary; occasionally in small groups in DRCongo. Nest built by both sexes, mainly male, over 3-4 weeks, an open bowl made of mud pellets and grass, lined with grass, hair, rootlets and feathers; affixed to wall or beam near roof of usually uninhabited building (especially hut with thatched roof, barn, poultry house), or on culvert, in mine or well, on rock, or in aardvark (*Orycteropus afer*) or porcupine (*Hystrix africaeaustralis*) burrow; nest of *Cecropis cucullata* sometimes used; nest reused for second brood, also in successive years. Clutch 2-4 eggs, usually 2-3, and one of 6 eggs reported; incubation by female, period 16-17 days; female also broods nestlings for at least 7 days, both sexes feed chicks, fledging period 20-23 days; young return to nest for several nights, fed by parents for a further 20 days.
Movements. Mainly resident with some post-breeding movement in N. Migratory S of c. 26° S; details not clear, but apparent influx in non-breeding season (mainly May-Jul) into N Botswana, Zimbabwe, Zambia and DRCongo. A few records from SW Tanzania, but uncertain whether these involve non-breeding migrants or a small breeding population.
Status and Conservation. Not globally threatened. Usually scarce and sparsely distributed, but can be locally common. Occurs throughout the year in Botswana but breeding not recorded there. Since 1900, numbers have increased in the Cape but decreased in Zimbabwe. Will use artificial nest-sites but, when it does, seems to prefer isolated, uninhabited buildings, and so has not benefited greatly from this habit; in South Africa, breeding on buildings largely restricted to W Cape. May suffer some competition for artificial sites from larger species; effects, if any, on population not known.
Bibliography. Aspinwall (1979c), Aspinwall & Beel (1998), Benson (1949), Benson & Benson (1977), Benson *et al.* (1971), Britton (1980), Claasen (1991), Clancey (1964b, 1996), Dean (1989c, 2000), Dean & Macdonald (1981), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Earlé (1988a), Every (1988), Fishpool & Evans (2001), Ginn *et al.* (1989), Harrison *et al.* (1997), Hockey (1996), Hockey *et al.* (1989), Irwin (1981), Keith *et al.* (1992), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Medland (1989a, 1992a), Moyer (1983), Newman (1996), Newman *et al.* (1992), Pedersen (2000), Penry (1994), Priest (1935), Schmidt (1959), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Spearpoint (1990), Stevenson & Fanshawe (2002), Tarboton (2001), Taylor (1983), Tree (1986b), Tyler & Borello (1998), Winterbottom (1962).

58. Montane Blue Swallow
Hirundo atrocaerulea

French: Hirondelle bleue **German**: Stahlschwalbe **Spanish**: Golondrina Azul
Other common names: (Eastern) Blue Swallow

Taxonomy. *Hirundo atrocaerulea* Sundevall, 1850, Natal, South Africa.
Has been placed in a separate genus *Natalornis* on basis of sexual dimorphism, distinctive plumage (without rufous, no white in tail), nest structure and egg coloration; within present genus, however, these features (apart from nest structure) are variable, suggesting that separate genus not warranted. Sometimes considered to form a superspecies with *H. nigrorufa*, but morphological differences probably too great to justify such a treatment. N population, with plumage washed violet, sometimes separated as race *lynesi*, but differences insignificant. Monotypic.
Distribution. Breeds SE DRCongo, S Tanzania, Malawi, NE Zambia, E Zimbabwe and adjacent W Mozambique, E South Africa (Eastern province and KwaZulu-Natal) and W Swaziland; migrates N to NE DRCongo, S Uganda and extreme W Kenya.

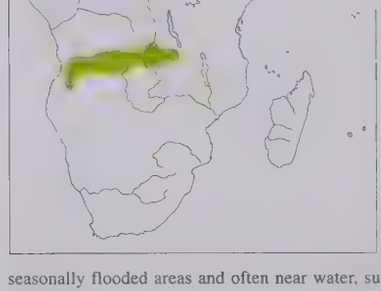


Descriptive notes. 18-25 cm; 13 g. Distinctive. Has glossy steel-blue plumage, sometimes with violet wash; outer tail feathers form very long, slender streamers; sometimes a few white streaks on flanks. Distinguished from *Psalidoprocne pristoptera*, the only similar all-dark swallow, by considerably longer tail. Female has shorter tail than male. Juvenile is duller, more sooty black, with brownish throat and chest, shorter tail, occasional white feathers on neck, rump and flanks. VOICE. Monotonous, plaintive song; calls include a quiet "choop-choop", a high-pitched alarm call, a quiet "chip chip" uttered in flight, and rapid "chip-pu-pu", "rip-rip" and "reap-reap".
Habitat. Open montane grassland; also seen in woodland edges and swamps. At 1500-2200 m in Zimbabwe, 850-1900 m in South Africa; at higher altitudes in N, e.g. 1800-2000 m in Tanzania.
Food and Feeding. Diet includes flies (Diptera). Feeds alone or in pairs, sometimes in groups of 4-5 individuals, occasionally up to 10; usually just above ground and working over a small area, but sometimes 50-100 m over valleys. Flight swift. Perches on bushes or stems, but flies almost continuously when breeding. Continues to forage in heavy mist; ceases during rain.
Breeding. Feb in DRCongo, Nov-Dec and Feb in Tanzania, Oct-Jan in Malawi, Nov-Jan in Zambia, Dec in Mozambique, Oct-Mar in Zimbabwe and South Africa; two broods reported, and two records of three at an artificial site. Solitary, rarely more than one nest or pair at a site; very aggressive to intruders. Aerial courtship display by male, which flies over female, extends wings upwards and spreads tail, and extends neck to touch or almost touch female's head. Nest built by both sexes, in one case taking 28 days, an open cup made of mud mixed with grass, lined with hair, grass, rootlets and feathers; affixed to wall or roof up to 5 m below ground in old burrow of aardvark (*Orycteropus afer*), pothole, riverbank, donga, mine or, rarely, culvert or building; nest of other hirundine also occasionally utilized; nests reused, once for 18 years. Clutch 2-4 eggs, normally 3; incubation by female, period 14-17 days, usually 15-16; chicks fed by both sexes, up to 3 times per minute, fledging period 20-26 days; young return to nest for a few nights. Nest losses due mainly to adverse weather, such as rain (causing erosion of site), late frosts, floods, cyclones (leading to entrance becoming obscured by vegetation), and rain or mist reducing efficiency of, or preventing, foraging; in one study, 36% of 22 breeding attempts over 24 years at a territory failed when nest collapsed or parents deserted, 78% of 37 eggs hatched and 93% of chicks fledged; in another study, low hatching success and high chick mortality (only 11% of eggs produced fledglings) were associated with prolonged mist and rain, also 31% of eggs were infertile and inbreeding within small population also suggested as a cause of low success; some indication of higher success on artificial sites, but evictions by *Cecropis cucullata* and *H. albigularis* also recorded at such sites.
Movements. Migratory; post-breeding flocks of 40 or more birds recorded. Absent from breeding grounds mainly end Apr to end Sept; leaves later and returns earlier in N of range. Spends non-breeding period in small area in L Victoria Basin (from NE DRCongo E to extreme W Kenya). Adults often return to same breeding site in successive years, males arriving before females.
Status and Conservation. VULNERABLE. Appendices I & II of CMS (Convention on the Conservation of Migratory Species of Wild Animals). Population estimated at c. 2000 pairs in 1998 and c. 3000 individuals at turn of century; declining owing to destruction of habitat. Locally common in Tanzania and Malawi, but scarce elsewhere; 100 pairs in DRCongo, 400 in Tanzania, 100 in Zambia, 360 in Malawi, 300 in Zimbabwe, 100 in Mozambique, 15 in Swaziland; c. 120 breeding pairs in South Africa, where listed as Critically Endangered. Because of territorial behaviour, breeding density naturally low, 3-4 pairs/km^2; in South Africa nests 300-1000 m (average 400 m) apart. Grassland habitat is being destroyed by afforestation, human settlement, and cultivation or livestock farming, and by the spread of non-native plants, such as pine (*Pinus*) and Australian bracken (*Pteridium*) and wattle (*Acacia*), which eliminate nesting and feeding sites. Overgrazing and frequent fires cause erosion of breeding sites; conversely, too little burning leads to increased obstruction by vegetation, preventing the clear flightpath to the nest required by this species. Another potential threat in South Africa is small-scale mining. Some disturbance of breeding pairs by humans and dogs recorded. Infrequently uses artificial nest-sites, but in E South Africa 81% of 31 sites were in mine workings. Only small numbers breed in protected areas: e.g. in Zimbabwe c. 200 pairs in Nyanga National Park and fewer than 50 pairs in Chimanimani National Park, and in Swaziland about five pairs in Malolotja Nature Reserve. Small populations may also lead to inbreeding problems. Conservation targets are to identify and conserve non-breeding areas; monitor breeding populations; control spread of non-native plants on breeding grounds; and assess effects of fires. Efforts to improve existing breeding sites and to create new ones, mimicking aardvark holes, have been successful.
Bibliography. Allan (1986, 1988), Allan, Gamble *et al.* (1987), Allan, Harrison *et al.* (1997), Anon. (1996a, 1996b), Aspinwall & Beel (1998), Barnes (2000), Bennun & Njoroge (1996, 1999), Benson & Benson (1977), Benson *et al.* (1971), Berruti *et al.* (1995), Boycott (1989), Brooke (1984b), Brown & Britton (1980), Byaruhanga *et al.* (2001), Chittenden (1994), Clancey (1964b, 1996), Collar & Stuart (1985), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dunning (1989), Dyer (1988), Earlé (1987c), Eksteen (1994), Evans (1996, 2001, 2002), Evans & Bouwman (2000), Finch (1989), Fleming (2003), Ginn *et al.* (1989), Grafton (1997), Harrison *et al.* (1997), Hilton-Taylor (2000), Hockey (1996), Huggett (1995), Johnson *et al.* (1996), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993b), McCartney (1994), Nasirwa & Njoroge (1997a, 1997b), Newman (1996), Newman *et al.* (1992), Parker (1994), Riede (2001), Rijke *et al.* (2000), Ryan, B. (1996, 1997), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Snell (1963a, 1969, 1970, 1979, 1981, 1988), Stattersfield & Capper (2000), Stevenson & Fanshawe (2002), Tarboton (1994, 2001), Zimmerman *et al.* (1996).

59. Black-and-rufous Swallow
Hirundo nigrorufa

French: Hirondelle roux et noir **German**: Rostbauchschwalbe **Spanish**: Golondrina Rojinegra

Taxonomy. *Hirundo nigrorufa* Bocage, 1877, Caconda, Angola.
Sometimes considered to form a superspecies with *H. atrocaerulea*, but morphological differences probably too great to justify such a treatment. Monotypic.
Distribution. Angola (Cuanza Sul S to N Huíla, E to S Lunda Norte and N Moxico) E to S DRCongo and N Zambia.



Descriptive notes. 13-14 cm; 13-16 g. Distinctive. Has forehead to hindneck and upperparts glossy violet-blue, wings and tail blackish with slight gloss; outer tail feathers slightly elongated; inner webs of rectrices with white edges (rather than patches); entirely rufous below. Differs from *Petrochelidon rufigula* in white edges (not patches) in tail, deeper rufous underparts, lack of rufous on rump. Female is slightly paler than male, with shorter tail. Juvenile is duller, browner above and paler below, tail shorter. VOICE. Song is a shrill warbling; also a strident "eeek".
Habitat. Grassland and savanna, especially seasonally flooded areas and often near water, such as streams; often hunts over miombo woodland. Also observed at edge of a swamp, over a fish pond, and in burnt and cleared woodland.
Food and Feeding. Diet includes flies (Diptera) and beetles (Coleoptera). Feeds alone or in pairs, occasionally in small groups of 4-5 individuals, usually very low, 1-2 m above ground; occasionally higher, especially when not breeding. Often perches on stems, bushes, termite (Isoptera) mounds, or fences. Flies quickly, with rapid wingbeats.
Breeding. Jul-Oct; single-brooded. Solitary, inter-nest distance along one river was 100 m; aggressive towards other hirundines. Aerial courtship display with wings held upwards. Nest-building

takes c. 4 weeks, nest an open cup made of mud and rootlets, lined with grass and sometimes a few feathers, usually affixed 0·2-0·7 m above water, below overhang, on bank of river or stream, once in a pit. Clutch 2-3 eggs, usually 3; incubation and fledging periods not documented.
Movements. Resident or partial migrant. Population in NW Zambia absent from breeding sites in late Nov to early Mar, but non-breeding areas not known; whether post-breeding movements occur elsewhere in range also unknown. Forms flocks of up to 20 after breeding.
Status and Conservation. Not globally threatened. Generally considered uncommon, although locally common. Common in Mwinilunga District, in Zambia; not uncommon in Angola. Potential breeding sites are rather more limited than for some other hirundines, as this species does not use artificial nest-sites.
Bibliography. Aspinwall & Beel (1998), Benson (1956), Benson *et al.* (1971), Bowen (1983a), Bowen & Colebrook-Robjent (1984), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Lippens & Wille (1976), Mackworth-Praed & Grant (1963, 1973), Pedersen (2000), Sinclair & Ryan (2003).


60
ssp fuligula
ssp obsoleta
ssp bansoensis
62
ssp perpallida
61
ssp pallida
ssp urbicum
ssp abyssinica
66
64
65
67
63
ssp ampliformis
ssp maxima
ssp lagopodum
ssp senegalensis
ssp daurica
ssp rufula
68
69
ssp monteiri
70
ssp vernayi
ssp japonica
ssp emini
ssp domicella
71
ssp hyperythra
ssp stanfordi
72
ssp striolata
PLATE 68
inches 4
cm 10

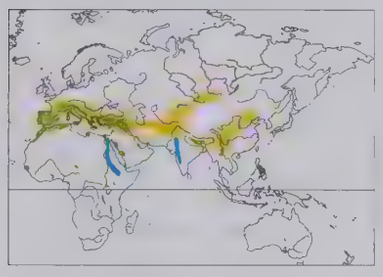
Genus *PTYONOPROGNE* Reichenbach, 1850

60. Eurasian Crag Martin

Ptyonoprogne rupestris

French: Hirondelle de rochers **German**: Felsenschwalbe **Spanish**: Avión Roquero
Other common names: Crag Martin, Mountain/Northern Crag Martin

Taxonomy. *Hirundo rupestris* Scopoli, 1769, Tirol, Austria.
Genus often merged with *Hirundo*, but DNA studies indicate that the two are sister-taxa. Forms a superspecies with *P. fuligula* and *P. concolor*; all three have been considered conspecific, but breeding ranges overlap. Birds from C Asia and S Morocco proposed respectively as races *centralasica* and *theresae* on basis of size, but variation not constant. Monotypic.
Distribution. Breeds S & SC Europe (S from S France, S Germany, Austria, Romania), NW Africa (Morocco E to Tunisia and NE Libya),W Arabian Peninsula, and from Asia Minor, Caucasus and Near East (S to Israel) E to Iran, S Russia (E to SW Siberia) and N Mongolia and, in S, to Himalayas (from Pakistan to Bhutan) and W, N & SC China; winters in Mediterranean region, N & NE Africa (also Senegambia and Guinea-Bissau), Middle East, India and S China.



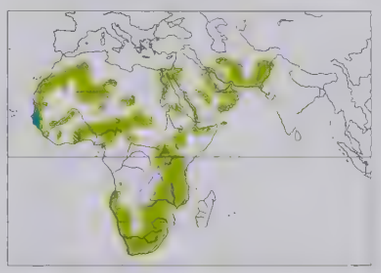
Descriptive notes. 15 cm; 17-33 g. Has brown-grey crown and upperparts, dark brown wings and tail; tail square, white spots on inner webs of feathers (except inner and outermost pairs, occasionally spots also on outer pair); chin and throat pale with dark speckling, pale buff breast grading into brown-grey belly and brown undertail-coverts; underwing-coverts blackish. Distinguished from very similar *P. fuligula* by generally darker coloration and usually larger size; from *Riparia riparia* by larger size, darker upperparts, underwing and undertail-coverts, white in tail, lack of breastband. Sexes alike. Juvenile has buffy feather edges, throat less dark than adult's and with indistinct mottling. Voice. Soft twittering song; calls include a contact call "prrrt", low- and high-intensity alarm calls "zrrr", "gsigsi", an excitement call "whee", an aggressive "rrr"; a series of notes is uttered during aerial chases of conspecifics.
Habitat. Mountains, crags and coastal cliffs; also around human habitations. In Europe from sea-level to 2500 m, mostly 500-1000 m in alpine valleys on NE/SW slopes; to over 4500 m in Asia. Forages close to cliff faces and over gorges, woodland and villages; outside breeding season also over farmland, meadows, rocky coasts, swamps and lakes.
Food and Feeding. Diet includes flies (Diptera), stoneflies (Plecoptera), caddis flies (Trichoptera), beetles (Coleoptera), bugs (Hemiptera), butterflies and moths (Lepidoptera), hymenopterans (ants and a wasp recorded) and spiders (Araneae); flies and small beetles seem to be main prey. Feeds in pairs or small groups. Flight slow, with frequent steady gliding. Flies back and forth along cliff face in sunny weather; at other times feeds over adjacent land; often flies below level of local dominant land surface, but also ascends high in thermals. Takes insects from rocks, and catches those disturbed as it flies past rock face. Occasionally perches on ground to feed and takes insects from water surface. Forages within 1·5 km of nest; feeding range in Spanish study was c. 0·2-0·25 km² when breeding and c. 1·5 km² in winter; birds roosting on Gibralter thought to feed within 5 km of roost-site.
Breeding. May-Aug; two broods. Solitary, or in small groups of usually 2-20, in Spain average c. 4·5-6·1 pairs (range 1-40); a few larger colonies known, e.g. 60 pairs in Iran, and 25, 50 and 100 pairs in Switzerland, but possibly aggregations of smaller groups; inter-nest distance in groups 10-80 m, average 14·4-16·2 m in one study and 30·5 m in another; will nest with Alpine Swift (*Tachymarptis melba*), *Cecropis daurica*, *Delichon urbicum* and *P. fuligula*. Aggressive to intruders; defends area of c. 200-300 m². Nest built by both sexes, taking 9-20 days, an open half-cup made of mud pellets, lined with grass and feathers, female continues to add lining during incubation; placed in crevice or under overhang on cliff face, also on bridge, or on or in building such as house, hotel, hill fort, castle or church, mainly 6-25 m (range 1-40 m) above ground in one study; nests reused in same and successive seasons. Clutch 2-5 eggs, usually 3 or 4, once 6; incubation from final egg, almost solely by female, 5% by male, at one nest female left 1-6 times per hour, period 13-17 days; hatching synchronous, chicks brooded closely for first few days, mostly by female, then less constantly until c. 10-11 days, fed by both sexes, one feed every 2-5 minutes, nestling period 24-27 days; fledglings fed by parents for further 14-21 days, return to nest to roost.
Movements. Populations in N of range generally migratory; resident in S. Forms post-breeding flocks of up to 400, sometimes associating with other hirundines, and roosts can number 1500-2000 birds (e.g. in caves in Gibralter). European breeders winter mainly in NW Africa but also Senegambia and Guinea-Bissau, Egypt, Red Sea coast and Ethiopia; some overwinter in N Mediterranean, especially on W side. Large passage movements over Strait of Gibralter Oct and Mar. Coastal Mediterranean populations resident, with local post-breeding movements; those breeding inland in Iberian and Balkan Peninsulas move to lower altitudes or the coast. Birds breeding farther E winter in Middle East, India and China; some Asian populations resident but disperse after breeding, e.g. in India and Nepal descends to lower altitudes (mostly below 2000 m) Oct-Mar; in Pakistan moves locally in N, sedentary in S. Vagrant farther N, e.g. in Finland and British Is.
Status and Conservation. Not globally threatened. Widespread and locally fairly common or common, e.g. throughout Mediterranean region. Distribution patchy and breeding irregular in N part of European range; nesting groups at least 1-5 km apart in Switzerland. Breeds only occasionally in Israel and Tunisia. In Europe, main population in Iberian Peninsula; since 1960s, range has been expanding N from Balkans and in Alps and Jura; increased use of bridges and buildings is allowing nesting away from mountain sites, e.g. in villages and towns.
Bibliography. Adamian & Klem (1999), Ali & Ripley (1987), Baudrenghien *et al.* (1989), Bertucco & Carlotto (1991), Bezzel & Fünfstück (1995), Cheng Tsohsin (1987), Christen (2001, 2003), Cramp (1970, 1988), Cuisin (1981), Dementiev *et al.* (1968), Dodsworth (1912), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elkins & Etheridge (1974), Étchécopar & Hüe (1964), Farina (1978), Finlayson (1978), Glutz von Blotzheim (1962, 2003), Glutz von Blotzheim & Bauer (1985), Guitián *et al.* (1980), Hable *et al.* (1991), Hagemeijer & Blair (1997), Hauri (1968, 1990), Heath *et al.* (2000), Higson & Urquhart (1990), Hoffman (1936), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Isenmann (2000a, 2000b), Kälin (1991), Keith *et al.* (1992), Kéry (1991), MacKinnon & Phillipps (2000), Mackworth-Praed & Grant (1960, 1973), Malo de Molina (2003b), Martin (2001), Mayaud (1951, 1960, 1986), Moreno (1986), Murr (1923), Niederfriniger (1973), Nieminen *et al.* (1993), Prenn (1937), Régnier (1999), Ripley (1982), Roberts (1992), Schmid *et al.* (2001), Schüz (1964), Shirihai (1996), Snow & Perrins (1998), Sorace (1986), Stadler (1928), Stephan (1997), Strahm (1953, 1954, 1956, 1963), Stresemann & Stresemann (1969), Thévenot *et al.* (2003), Uhlig (1992), Wittenberg (1999).

61. Rock Martin

Ptyonoprogne fuligula

French: Hirondelle isabelline **German**: Steinschwalbe **Spanish**: Avión Isabelino
Other common names: Pale Crag Martin (N races); Red-throated Rock Martin (*pusilla*, *bansoensis*, *fusciventris*); African Rock Martin (*anderssoni*, *pretoriae*, *fuligula*)

Taxonomy. *Hirundo fuligula* M. H. K. Lichtenstein, 1842, Baviaan River, Cape Province, South Africa.
Genus often merged with *Hirundo*, but DNA studies indicate that the two are sister-taxa. Forms a superspecies with *P. rupestris* and *P. concolor*; all three have been considered conspecific, but breeding ranges overlap. Taxonomy complex, requires further study. Races appear to form three separate groups: "*obsoleta* group" of pale N races (also comprising *presaharica*, *spatzi*, *buchanani*, *perpallida*, *pallida*, *arabica*), often treated as constituting a separate species; small and dark "*fusciventris* group" (also including *pusilla* and *bansoensis*) of W, C & E Africa; and large-sized "nominate group" (also with *anderssoni* and *pretoriae*) of S Africa. Variation in coloration and size, however, mainly clinal; moreover, all races intergrade with one another, and ranges not clearly demarcated. Proposed race *birwae* (Sierra Leone, Guinea) synonymized with *bansoensis*; birds from N Nigeria and Chad E to Ethiopia and S to DRCongo, Uganda and N Tanzania described as race *rufigula*, but that name invalid, as preoccupied, and therefore synonymized with *fusciventris*. Thirteen subspecies usually recognized.
Subspecies and Distribution.
P. f. presaharica (Vaurie, 1953) - S Morocco, Algeria (except S) and N Mauritania.
P. f. spatzi (Geyr von Schweppenburg, 1916) - S Algeria, SW Libya and N Chad.
P. f. buchanani (Hartert, 1921) - Niger.
P. f. obsoleta (Cabanis, 1850) - Egypt E to N, C & E Arabia and Iran.
P. f. perpallida (Vaurie, 1951) - S Iraq and NE Saudi Arabia.
P. f. pallida Hume, 1872 - E Iran, SW & SE Afghanistan and Pakistan.
P. f. arabica (Reichenow, 1905) - NE Chad (Ennedi), N Sudan, SW Arabia, Eritrea, N Somalia and Socotra.
P. f. pusilla (Zedlitz, 1908) - S Mali E to Ethiopia and Eritrea.
P. f. bansoensis (Bannerman, 1923) - Sierra Leone E to Nigeria and Cameroon.
P. f. fusciventris Vincent, 1933 - S Chad, Central African Republic, W & S Sudan, SW Ethiopia, and E Africa S to Zimbabwe and N Mozambique.
P. f. anderssoni (Sharpe & Wyatt, 1887) - N & SW Angola and N & C Namibia.
P. f. fuligula (M. H. K. Lichtenstein, 1842) - S Namibia, Botswana and W South Africa.
P. f. pretoriae Roberts, 1922 - SW Zimbabwe and S Mozambique S to E South Africa.



Descriptive notes. 13-16 cm; 16-30 g. Nominate race has dark earth-brown crown and upperparts, darker brown wings and tail; tail square, white spots on inner webs of feathers (except central and, usually, outer pairs); chin and throat pinkish-cinnamon, colour extending over upper breast and underwing-coverts; belly and undertail-coverts dark grey-brown. Distinguished from very similar *P. rupestris* by smaller size (usually) and generally slightly paler, greyer coloration; from *Riparia* species by white in tail, no breastband. Sexes alike. Juvenile has buff feather edges. Races differ in size and in depth of colour: *pretoriae* is marginally bigger and paler than nominate; *anderssoni* is paler, greyer and marginally smaller than nominate; *fusciventris* is smaller and darker, dark brown, throat pinkish-fawn, breast tinged rufescent; *bansoensis* is even darker than last, upperparts glossy; *pusilla* is paler than previous races, breast pinkish-grey; *buchanani* differs from last in somewhat paler coloration; *arabica* is paler and greyer, throat light pink, breast light grey-brown with pink wash, slightly larger than last; *spatzi* resembles previous but slightly paler, is more buff below, with less pink tinge; *presaharica* is very like last but slightly paler, more sandy; *obsoleta* is paler and greyer than last, more grey-brown, whitish below; *perpallida* is very pale, whitish-grey above, whitish below; *pallida* is pale sandy grey above, rump paler, buffish-white throat, whitish below. Voice. Not very vocal; song is a soft twittering; calls include a contact call "twee", a "chirp" and a rapid "chir chir chir".
Habitat. Mountains, crags, cliffs, gorges, coasts, also human habitations, including towns and cities; mostly in arid habitats, including deserts. To 3000 m. Also pools, swamps and lakes when not breeding.
Food and Feeding. Diet includes flies (Diptera), beetles (Coleoptera), bugs (Hemiptera), Hymenoptera (including flying ants). Forages in pairs or small groups; mixes with other hirundines and with swifts (Apodidae). Keeps mainly close to cliff and ground; in one study fed within 10 m of ground and 40 m from nest, in another at average of 7 m above ground. Flight slow, with frequent gliding; glides back and forth along cliff face or building. Visits grass fires, and occasionally feeds on ground. Active at dawn and dusk, and feeds late in evening.
Breeding. Feb-Apr in NW Africa, Jan-Jun in Egypt, mainly Mar-May (some to early Jul) in Israel, and Apr-Jun in SW Asia; mainly May-Jun/Jul and Oct-Dec in W Africa, Jan-Mar and Oct-Dec in Ethiopia; in all months in E Africa, peaks varying geographically; Feb in Angola, Feb-Apr and Jul-Nov in Zambia, Jan-Apr and Aug-Nov in Zimbabwe; mainly Aug-Apr (peak Sept-Jan) in S Africa, but in any month after rains in Kalahari Desert; may have up to three broods. Solitary, or sometimes in small, scattered groups of up to 40 pairs: a record of pair nesting in *Cecropis abyssinica*

On following pages: 62. Dusky Crag Martin (*Ptyonoprogne concolor*); 63. Northern House Martin (*Delichon urbicum*); 64. Asian House Martin (*Delichon dasypus*); 65. Nepal House Martin (*Delichon nipalense*); 66. Greater Striped Swallow (*Cecropis cucullata*); 67. Lesser Striped Swallow (*Cecropis abyssinica*); 68. Rufous-chested Swallow (*Cecropis semirufa*); 69. Mosque Swallow (*Cecropis senegalensis*); 70. Red-rumped Swallow (*Cecropis daurica*); 71. Striated Swallow (*Cecropis striolata*); 72. Rufous-bellied Swallow (*Cecropis badia*).

colony. Aggressive to intruders near nest. Nest built by both sexes, sometimes taking several weeks, an open full cup or half-cup made of mud pellets, lined with vegetable fibres and feathers; affixed 3-15 m above ground beneath overhang on rock face, dam or bridge, or to beam or under eaves of building (including tombs, temples) or verandah; nests reused in same and successive seasons, also used for roosting in non-breeding season. Clutch 2-3 eggs in Africa, 3-5 (usually 3) in Middle East and Pakistan; incubation by both sexes, bouts lasting 2-12 minutes, period 13-18 days; chicks fed by both sexes, brood of 3 fed every 1·9 minutes, brooded by both sexes for much of first 3-4 days, fledging up to 25-30 days, but fledglings often flutter between nest and nearby perch for several days; young fed by parents for up to a further 19 days. Nests sometimes usurped by Little and White-rumped Swifts (*Apus affinis* and *A. caffer*). Oldest recorded bird 6 years 9 months.

Movements. Resident in tropics; elsewhere a partial migrant, with local changes in numbers. Forms usually small post-breeding flocks, up to c. 300 individuals; roosts, on buildings, can contain hundreds of birds. Non-breeding visitor to some areas, such as N Senegambia, SW Mauritania and N Somalia; present only during breeding season in some parts of NW Africa. In S Africa, Middle East and Pakistan, resident or moves locally, e.g. to lower altitudes, after breeding. Flocks move around to exploit food concentrations.

Status and Conservation. Not globally threatened. Widespread and generally common; scarce in Namibia and Botswana. Density at Cape Town, in South Africa, was c. 5 pairs/km^2. Sometimes local because of specialized nest-sites. On other hand, readily nests on buildings, even in cities such as Aswan (Egypt) and Harare (Zimbabwe), and has done so for over a century; has consequently expanded range into less rocky habitat, e.g. since 1970s into Negev Desert (S Israel) and in late 1980s into urban settlements in NE United Arab Emirates; uses farmhouses in the Karoo and Kalahari Deserts. Some nest-site competition from swifts, but no obvious effects on population sizes.

Bibliography. Ali & Ripley (1987), Archer & Godman (1937-1961), Ash & Miskell (1998), Aspinall (1996), Bannerman (1953), Bates (1936), Batten (1943), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Brooke & Vernon (1961), Bundy & Morgan (1969), Byaruhanga *et al.* (2001), Carr (1984), Cheke & Walsh (1996), Clancey (1964b), Cramp (1988), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dyson (1976), Earlé (1988a), Elgood *et al.* (1994), Étchécopar & Hüe (1964), Gatter (1997), Ginn *et al.* (1989), Goodman *et al.* (1989), Grimes (1987), Grimmett *et al.* (1998), Hall & Moreau (1970), Harrison *et al.* (1997), Hüe & Étchécopar (1970), Hull (1944), Irwin (1977), Jennings (1980a, 1995), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Meinertzhagen (1930), Moreau (1939a), Moreau & Moreau (1940), Nikolaus (1987), Paz (1987), Penry (1994), Rands *et al.* (1987), Roberts (1992), Schmidt (1964, 1990), Sclater & Moreau (1933), Shirihai (1996), Short *et al.* (1990), Sinclair & Hockey (1996), Skead (1966), Snow & Perrins (1998), van Someren (1958), Stevenson & Fanshawe (2002), Stuart Baker (1934), Tarboton (2001), Tarboton *et al.* (1987), Taylor (1942), Thévenot *et al.* (2003), Tilahun *et al.* (1996), Uhlig & Uhlig (1996, 1998), Ussher (1944), Valverde (1957), Vaurie (1959), Waugh (1978), Zimmerman *et al.* (1996).

62. **Dusky Crag Martin**

Ptyonoprogne concolor

French: Hirondelle concolore **German**: Einfarbschwalbe **Spanish**: Avión Oscuro
Other common names: Dusky Martin

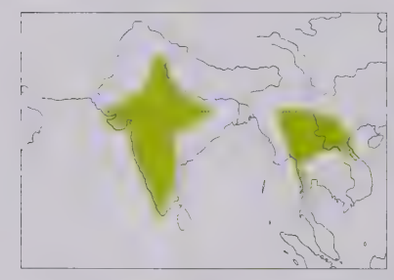
Taxonomy. *Hirundo concolor* Sykes, 1832, Dukhun, India.

Genus often merged with *Hirundo*, but DNA studies indicate that the two are sister-taxa. Forms a superspecies with *P. rupestris* and *P. fuligula*; all three have been considered conspecific, but breeding ranges overlap. Race *sintaungensis* possibly not clearly distinguishable from nominate, which varies in darkness. Two subspecies tentatively recognized.

Subspecies and Distribution.

P. c. concolor (Sykes, 1832) - extreme SE Pakistan and India (from Gujurat, E Rajasthan and Haryana E to W Bihar, S to Kerala and W Tamil Nadu).

P. c. sintaungensis (Stuart Baker, 1933) - E & S Myanmar, S China (S Yunnan), N & E Thailand, N Laos and N Vietnam.



Descriptive notes. 13 cm; 12-14 g. Plumage is mostly dark sooty brown (variable, to blackish), paler below; tail square, white patches except on outermost and innermost pairs; chin, throat and foreneck buffy brown with blackish streaks; underwing-coverts dark brown. Differs from *P. rupestris* and *P. fuligula* in much darker colour, uniformly dark underparts. Sexes alike. Juvenile has rufous-grey feather edges, paler throat. Race *sintaungensis* is darker than nominate, almost black on back, with darker brown underparts. Voice. Twittering song; contact call a soft "chit"chit".

Habitat. Mountainous areas with cliffs and gorges, also lowland areas with suitable breeding sites; also around human habitations, including towns and cities. To 1800 m.

Food and Feeding. Dietary details not known. Feeds alone or in pairs, occasionally in small groups; often associates with other hirundines. Forages around buildings and cliffs; flight slow, with frequent gliding.

Breeding. Jan-Oct; mainly Feb-Mar and after rains in Jul-Aug in India, Feb-May and Jul-Oct in Pakistan; Mar-Apr in SE Asia. Solitary, or small scattered groups if suitable nest-sites abundant. Nest built by both sexes, a half-bowl made of mud pellets, lined with dry grass and feathers, usually placed under overhang up to 30 m above ground on cliff, riverbank, cave wall, bridge, culvert, well, fort, mosque or tomb, or under eaves of other building; old nests repaired and reused. Clutch 2-4 eggs, rarely 5; incubation and brood-feeding by both sexes; incubation and fledging periods not documented.

Movements. Resident, with some local post-breeding movements. Forms small flocks when not breeding. Vagrant in Sri Lanka; possible vagrant in Borneo.

Status and Conservation. Not globally threatened. Generally common to locally common. Common where breeding sites abundant, including in cities such as Bombay (India), but only locally distributed; rare in Pakistan. Fairly common in SE Asia, where possibly more widespread in mountainous areas than is indicated by confirmed breeding records; single breeding record and some sight records from SW Peninsular Malaysia (Selangor), and suspected as occurring more widely in highlands of that region. Has benefited from use of artificial nest-sites.

Bibliography. Ali (1969, 1996), Ali & Ripley (1987), Duckworth *et al.* (1999), Grimmett *et al.* (1998), Jeyarajasingam & Pearson (1999), King *et al.* (1975), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Mukherjee (1995), Ripley (1982), Roberts (1992), Robson (2000), Smythies (1986), Stuart Baker (1934), Vaurie (1951b), Vowles & Vowles (1985), Wells (1984), Yu Yixin & Cheng Tsohsin (1962).

Genus *DELICHON* F. Moore, 1854

63. **Northern House Martin**

Delichon urbicum

French: Hirondelle de fenêtre **German**: Mehlschwalbe **Spanish**: Avión Común
Other common names: House Martin, Common/European/Western House Martin

Taxonomy. *Hirundo urbica* Linnaeus, 1758, Sweden.

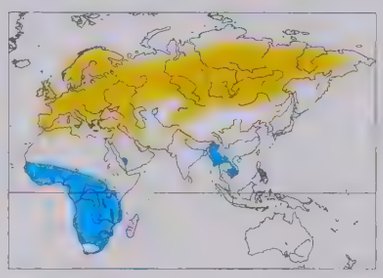
Forms a superspecies with *D. dasypus*; sometimes considered conspecific, but breeding ranges overlap (e.g. S of L Baikal). Nominate race exhibits largely clinal decrease in size from N to S, but abrupt size reduction in S Europe; birds in WC Europe sometimes separated as race *fenestrarum*. Race *lagopodum* and nominate breed parapatrically in Buryatia (S & E of L Baikal); review of taxonomic status of former required. Occasionally hybridizes with *Hirundo rustica*. Three subspecies recognized.

Subspecies and Distribution.

D. u. urbicum (Linnaeus, 1758) - W, C & N Europe E to W Siberia; winters mainly sub-Saharan Africa.

D. u. meridionale (Hartert, 1910) - S Europe, N Africa and WC Asia (E to Tien Shan and Kashmir); winters Africa and SW Asia.

D. u. lagopodum (Pallas, 1811) - E Asia from middle and upper R Yenisey, Altai Mts and N Mongolia E to Anadyrland, Sea of Okhotsk and NE China; probably winters mainly SE Asia.



Descriptive notes. 13-14 cm; 16-23 g. Male breeding has glossy blue crown and back, white rump, sometimes white feather bases showing on hindcrown; wings and tail black, tail moderately forked; wholly white below, legs with white feathering. Distinguished from *D. dasypus* by more glossy upperparts, whiter underparts, deeper tail fork. In non-breeding plumage, white on rump, face side, throat and flanks mottled brown-grey. Female has greyer underparts than male. Juvenile is duller, browner (less blue), with tail shorter. Race *meridionale* is smaller than nominate; *lagopodum* has more white on lower back, less deeply forked tail. Voice. Song is a soft twittering; calls include a shrill contact call "prt" or longer "triit-triit, an enticement call "za-za-za" used by males to attract a mate, and a threat call, various warning and alarm calls "trieer", "tsieer" and high-pitched "tsitsitsitsier", and a hissing distress call.

Habitat. Open areas, coastal cliffs, cultivation, and human habitations, including towns and cities; in mountainous areas mostly to 2000 m in Europe, but to 4500 m in Asia. Roosts in nests, sometimes communally, and on trees and cliffs, rarely in reedbeds; also thought to sleep on the wing, especially in winter quarters.

Food and Feeding. Almost entirely insects, predominantly small ones. Diet in S England (mainly nestlings) 60% flies (Diptera), 18% aphids (Homoptera), 11% parasitic Hymenoptera, 5% beetles (Coleoptera), other insects including flying ants; proportion of aphids declines over summer, from 46% in May to 4% in Aug-Sept. Nestling diet in Switzerland 45% dipterans, 33% aphids, 7% other bugs (Hemiptera), 8% mayflies (Ephemeroptera), stoneflies (Plecoptera) and caddis flies (Trichoptera), 3% Hymenoptera, 2% beetles, 1% psocids (Psocoptera); in Poland, 58% hemipterans (mainly aphids), 32% dipterans, 4% coleopterans, 3% hymenopterans; in W Russia (Moscow region), 53% hemipterans, 17% dipterans, 13% ephemeropterans, 8% coleopterans, 6% ants. Other items recorded include small Odonata, small lepidopterans and small orthopterans, and spiders (Araneae). Forages in flocks, sometimes with other aerial feeders. Flight slow, usually high up, average height 21 m in breeding season and over 50 m on wintering grounds. Forages at up to 2 km from nest, average 0·45 km. Occasionally perches on ground, rocks or vegetation to pick up insects; will follow ploughs and large animals to feed on flushed insects.

Breeding. Laying from May in NW & C Europe, end May-Jun in N & NE Europe; starts Mar-May in S Spain and N Africa; Jun-Jul in N Indian Subcontinent (Ladakh, N Kashmir); season ends Aug-Sept or Oct; often two broods. Socially monogamous, but extra-pair paternity occurs (in two studies, 32% and 35% of broods, 15% and 19% of nestlings). In colonies of tens to hundreds of pairs, usually 4-5, colonies larger (mostly 10-50 nests) on cliffs, but colony size often varies annually (from 0 to 513 nests over 25 years in one study); nests often clustered together, abutting each other, entrances at least 8-10 cm apart, small area (radius of c. 10 cm) around entrance defended. Male attracts female by calling and following her, approaches and sings when she perches, potential partners often initially mutually aggressive; copulation mostly inside nest, soliciting male, if accepted, seizes female's crown or nape and mounts; male guards mate during nest-building and egg-laying. Nest built by both sexes, taking 8-18 days (average 10·4 days), enclosed, with small entrance hole near top, made of mud pellets, lined with vegetable fibres and feathers; attached to outside of building or, less often, bridge, usually under overhang, sometimes inside building (increasingly so in some areas, e.g. Belgium and N France), occasionally on natural sea cliff or rock face, rarely in cave or tree; nests reused in same and successive seasons; old nest of *Hirundo rustica* occasionally used. Clutch 1-7 eggs, normally 4-5, e.g. of 882 clutches in Germany 38% were of 4 eggs, 29% of 5, 23% of 3, 5% of 6, 4% of 2 and 1% of 7; clutch size decreases over season, e.g. means of 4·8 for first clutch and 3·3 for second; incubation by both sexes, male contribution variable, equal to female's in Norwegian study, less in Finnish one, in Finland bouts by female averaged 13 minutes, by male 9 minutes, incubation period 14-16 days; hatching often asynchronous; chicks brooded by both sexes, male contribution variable, brooding intense for first few days, declines over days 4-11, also fed by both sexes, usually in bouts, with periods of c. 30 minutes with few feeds; fledging 22-32 days, depending on brood size and weather; fledglings return to nest to roost for several days, fed by parents for a few days, sometimes stay in colony for several weeks. Breeding success 56-81%; nestling mortality from starvation can be high in bad weather. Oldest recorded bird 14 years 6 months.

Movements. Migratory. Forms flocks of several hundreds or thousands after breeding. Main migration periods Sept-Oct and Apr-May. W populations migrate N-S across Europe, winter mainly in sub-Saharan Africa; records in Africa scarce and widely scattered, largest numbers in S; not recorded in roosts. From ringing studies, Baltic and Scandinavian breeding populations appear to winter in Zambia, Zimbabwe and South Africa, and W European ones in W Africa; S European populations may winter in Sahel zone. Common and widespread on passage through India, where a few individuals may winter in S. E populations probably winter in S & SE Asia. Generally returns to same breeding site in successive years, males more so than females; older individuals arrive before first-years. Vagrants recorded in several countries, e.g. Greenland, Iceland, USA (Alaska), Bermuda.

Status and Conservation. Not globally threatened. Common and widespread, but numbers fluctuate locally. In Europe, population stable overall but some recent declines, e.g. in region from Scandinavia to Netherlands and Germany; in Brussels (Belgium) declined by 75% in 1982-1992, and Netherlands population in 1990s was only 35% of that in 1965. Has occasionally bred outside normal range, as in Iceland, Faeroes and Malta. Population in Israel increased from a few pairs in 1940s to c. 2000 pairs from 1970s. Adverse weather can have marked effect during breeding and migration. Suffers nest-site competition from House Sparrows (*Passer domesticus*); in study in Poland, avoidance of this species thought to be reason for recent change in breeding sites from outside walls to inside buildings. In Europe, nests in towns and cities more readily than does *Hirundo rustica*. Has benefited from building developments, which provide additional nesting sites, and from reduction of pollution in cities such as London (UK), which leads to increase in food supply; in Berlin (Germany), 36% increase between 1979 and 1983/84. Readily utilizes specially designed nestboxes.

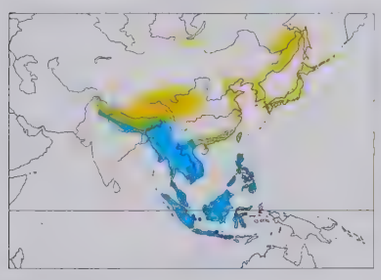
Bibliography. Adamian & Klem (1999), Ali & Ripley (1987), Andrew (1993), Antón (1984), Archipenko *et al.* (1968), Ash (1992a), Balat (1974), Bell (1983), Beser (1968), Bouldin (1968), Bruderer (1975), Bryant (1973, 1975, 1978a, 1978b, 1979, 1988, 1989), Bryant & Gardiner (1979), Bryant & Turner (1982), Bryant & Westerterp (1980, 1982, 1983a, 1983b), Bulgarini & Visentin (1997), Buschendorf (1975), Chapin (1953), Christie, de Lope *et al.* (2001), Christie, Møller & de Lope (1998), Christie, Møller, Saino & de Lope (2000), Clancey (1950), Clark & McNeil (1980), Cramp (1988), Cramp & Gooders (1967), Cretin *et al.* (1971), Creutz (1961), Daoudi *et al.* (2002), Darolova (1997), Dementiev *et al.* (1968), Dolnik & Kinzhewskaja (1980), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Étchécopar & Hüe (1964), Fletcher (1987), Fouarge (1992), Germogenov (1985), Glutz von Blotzheim & Bauer (1985), Goodman *et al.* (1989), Guan Guosheng *et al.* (1988), von Gunten (1961, 1963), von Gunten & Schwarzenbach (1962), Gustafson *et al.* (1985), Hagemeijer & Blair (1997), Hails & Bryant (1979), Harrison *et al.* (1997), Heath *et al.* (2000), Hill (1992, 1997, 2000), Hund (1976), Hund & Prinzinger (1979a, 1979b, 1985), Jonkers & Leys (1994), Kaminski, Choinski & Wotosiuk (1993), Kaminski, Wotosiuk & Choinski (1993), Keith *et al.* (1992), Kondélka (1978), Kozená (1975), Lifjeld & Marstein (1994), Lind (1960, 1962, 1963, 1964), Löhrl (1971), de Lope (1986, 2003c), de Lope & da Silva (1988), de Lope, González *et al.* (1993), de Lope, Møller & Cruz (1998), Loske (1986b), Lyulceva (1974), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), McNeil & Clark (1987), Menzel (1984), Milwright (1990), Møller (1984), Møller *et al.* (1994), Moreno & Møller (1996), Newman *et al.* (1985), Oliver (1975), Pajuelo *et al.* (1992), Palmgren (1960), Pons (1989), Prinzinger & Siedle (1986, 1988a, 1988b), Prinzinger *et al.* (1979), Rheinwald (1970, 1971, 1973, 1975a, 1975b, 1977, 1979), Rheinwald & Gutscher (1969a, 1969b), Rheinwald & Schulze-Hagen (1972), Rheinwald *et al.* (1976), Riley *et al.* (1995), Roberts (1992), Rydzewski (1978), Sharrock (1976), Shirihai (1996), Snow & Perrins (1998), Steen *et al.* (1989), Stoepel (1984), Stremke & Stremke (1985), Tebb & Ranner (2002), Telleria *et al.* (1999), Tryjanowski & Kuczynski (1999), Turner (1982a), Uribe & Hostau (1988), Vaurie (1951b), Westerterp & Bryant (1984), Whittingham & Lifjeld (1995a, 1995b).

64. Asian House Martin

Delichon dasypus

French: Hirondelle de Bonaparte **German**: Kaschmirschwalbe **Spanish**: Avión Asiático
Other common names: Asian Martin; Kashmir House Martin (*cashmeriense*)

Taxonomy. *Chelidon dasypus* Bonaparte, 1850, Borneo.
Forms a superspecies with *D. urbicum*; sometimes considered conspecific, but breeding ranges overlap, e.g. S of L Baikal. Three subspecies recognized.
Subspecies and Distribution.
D. d. cashmeriense (Gould, 1858) - Himalayas from Pakistan E to SC China; winters N India and SE Asia.
D. d. dasypus (Bonaparte, 1850) - SC & SE Russia (Khamar-Daban, Ussuriland, Sakhalin) and Kuril Is S to NE China, Korea and Japan; winters SE Asia S to Greater Sundas and Philippines.
D. d. nigrimentale (Hartert, 1910) - S & E China and Taiwan; winters SE Asia.



Descriptive notes. 13 cm; 18 g. Has glossy blue crown and back, white rump and shorter uppertail-coverts; wings and tail blackish-brown, tail slightly forked; underparts white with grey wash, legs with white feathering; underwing-coverts grey-brown. Differs from *D. urbicum* in less glossy plumage, darker underparts, less deeply forked tail. Sexes alike. Juvenile is duller, dusky wash on underparts, tertials tipped white, tail squarer. Races differ mainly in size: *cashmeriense* is smaller than nominate, also has brighter blue upperparts, purer white rump and underparts; *nigrimentale* is smallest. Voice. Song is a soft twittering; shrill contact call.
Habitat. Valleys and gorges in mountainous areas and sea coasts, also human habitations. Mostly above 1500 m, and to over 3000 m; breeds at 1300-4800 m in India, often over 3000 m in Pakistan, and to 4000 m in Nepal.
Food and Feeding. Diet includes small dipteran flies (especially Nematocera and Brachycera, also Syrphidae), bugs (Hemiptera) including homopterans, beetles (Coleoptera), Hymenoptera (including winged ants), small Lepidoptera, caddis flies (Trichoptera), lacewings (Neuroptera), stoneflies (Plecoptera), springtails (Collembola). Feeds in flocks, high up, with slow flap-and-glide flight. Presence in diet of springtails and caterpillars suggests occasional feeding while perched.
Breeding. Mar-Oct in N, Apr-Jul in S; may have up to three broods, possibly only one in Himalayas. Colonial, in small groups; nests often scattered at a site, but sometimes close together. Nest built by both sexes, made of mud pellets, often mixed with grass, and lined with feathers and occasionally other material, such as pine (*Pinus*) needles and moss, shape variable, depending on where built, can be either enclosed with an entrance hole or open at top; attached to cliff face, cave wall, or occasionally on bridge or building, such as house, temple, hotel or power plant, usually under overhang. Clutch 2-6 eggs, usually 3 or 4; incubation and brood-feeding shared by both sexes, incubation and fledging periods not documented; fledglings return to nest for a few nights to roost. Oldest recorded bird 6 years 4 months.
Movements. Largely migratory; extent of winter ranges unclear. NE populations (nominate race) migrate S to, primarily, Malay Peninsula; uncommon in Singapore, and rare in Philippines, Borneo, Sumatra and Java; some winter in S Japan. W race (*cashmeriense*) moves to lower altitudes, occurring in non-breeding season from N India E to SE Asia. Race *nigrimentale* perhaps mainly resident.
Status and Conservation. Not globally threatened. Locally common. Extent of range in S Russia uncertain: recent expansion into Khamar-Daban region; any breeding localities between this region and Ussuriland and Sakhalin not yet known. Restricted to natural nest-sites to greater degree than is *D. urbicum*.

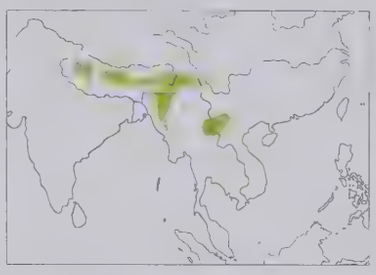
Bibliography. Ali & Ripley (1987), Austin & Kuroda (1953), Bates & Lowther (1952), Brazil (1991), Carey *et al.* (2001), Cheng Tsohsin (1987), Dementiev *et al.* (1968), Dickinson *et al.* (1991), Duckworth *et al.* (1999), Dyrnev *et al.* (1983), Étchécopar & Hüe (1983b), Evans (1994), Glutz von Blotzheim & Bauer (1985), Gore & Won Pyongoh (1971), Grimmett *et al.* (1998), Hasson (1976), Inskipp & Inskipp (1991), Jahn (1942), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Knystautas (1993), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Medway & Wells (1976), Roberts (1992), Robson (2000), Smythies (1999), Stepanyan (1990), Stepanyan & Vasilchenko (1980), Stuart Baker (1934), Vasilchenko (1987), Vaurie (1954b), White & Bruce (1986).

65. Nepal House Martin

Delichon nipalense

French: Hirondelle du Népal **German**: Nepalschwalbe **Spanish**: Avión Nepalí
Other common names: Nepal Martin

Taxonomy. *Delichon nipalensis* F. Moore, 1854, Nepal.
Plumage variation somewhat clinal, amount of black on throat increasing from W to E. Two subspecies recognized.
Subspecies and Distribution.
D. n. nipalense F. Moore, 1854 - Himalayas from Nepal and SE Tibet E to W Myanmar.
D. n. cuttingi Mayr, 1941 - NE Myanmar, S China (extreme SW Yunnan), NE Thailand, N Laos and NW Vietnam (W Tonkin).



Descriptive notes. 12 cm; 14-16 g. Male has glossy blue crown and back, blue on side of head extending well below eye; rump white, uppertail-coverts white with dark bands; wings and tail brownish-black, tail square-ended; chin and upper throat black, lower throat to abdomen white, undertail-coverts black, legs with white feathering; underwing-coverts dark grey-brown. Distinguished from *D. urbicum* and *D. dasypus* by more extensive blue-black on side of head, black upper throat, black undertail-coverts, square tail. Female is greyer below than male. Juvenile is duller, with less black on throat, buffy underparts. Race *cuttingi* is larger than nominate, with more black on throat. Voice. Not very vocal; high-pitched "chi-i" recorded in flight.
Habitat. Valleys and mountain ridges, open areas with cliffs; also around villages. Breeds to at least 3500 m in Nepal, at 1000-4000 m in India, and to c. 1850 m in SE Asia; lower in non-breeding season, down to 300 m, locally 150 m.
Food and Feeding. Diet includes flies (Diptera). Feeds in flocks, sometimes with other hirundines and swifts (Apodidae), and often high up; flight a mix of gliding and swooping. Often forages along cliffs and over treetops.
Breeding. Generally Mar/Apr-Sept, varying locally; may be double-brooded. Colonial, in groups of tens or hundreds of pairs, often 25-50, some of c. 700 pairs recorded; nests usually not contiguous. Nest built by both sexes, enclosed and with small entrance hole, made of mud pellets, lined with grass and feathers; attached to cliff face, usually under overhang, rarely on artificial site but once a group of three nests on wooden beam in house; nest often used for roosting throughout year. Clutch 3-4 eggs, occasionally 5; incubation and brood-feeding by both sexes, incubation and fledging periods not known.
Movements. Resident; sometimes moves short distances, especially to lower altitudes, after end of breeding.
Status and Conservation. Not globally threatened. Nominate race common to fairly common; widespread and fairly common in Nepal, locally fairly common in India, common in Bhutan. In E of range (*cuttingi*) generally uncommon, and scarce in S China (extreme SW Yunnan). More or less restricted to areas with suitable natural nest-sites, as appears reluctant to exploit artificial ones.

Bibliography. Ali & Ripley (1987), Cheng Tsohsin (2002), Delacour & Jabouille (1940), Duckworth *et al.* (1999), Étchécopar & Hüe (1983b), Grimmett *et al.* (1998), Inskipp, C. & Inskipp (1991), Inskipp, C. *et al.* (1999), Inskipp, T. *et al.* (1996), King (1997), Lister (1954), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Ripley (1982), Robson (2000), Smythies (1986), Stanford & Mayr (1941), Stresemann & Stresemann (1969), Stuart Baker (1934), Tye & Tye (1986), Vaurie (1951b, 1959).

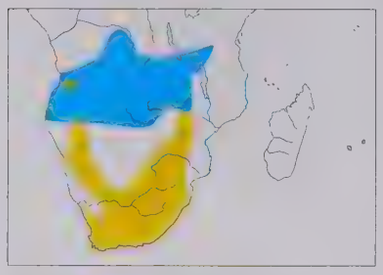
Genus *CECROPIS* Boie, 1826

66. Greater Striped Swallow

Cecropis cucullata

French: Hirondelle à tête rousse **German**: Kapschwalbe **Spanish**: Golondrina Cabecirrufa
Other common names: Streaked Swallow, Larger Stripe-breasted Swallow

Taxonomy. *Hirundo cucullata* Boddaert, 1783, Cape of Good Hope, South Africa.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Often considered to form a superspecies with *C. abyssinica*, although ranges overlap widely in S Africa. Monotypic.
Distribution. Breeds Angola, and from C Namibia, SE Botswana and E & C Zimbabwe S to South Africa; migrates N to N Angola, Zambia, S DRCongo and SW Tanzania.
Descriptive notes. 18-20 cm; 19-35 g. Has forehead and crown dark rufous-chestnut, neck side and hindneck paler, back glossy deep blue, rump and shorter uppertail-coverts light rufous-chestnut; wings and tail brownish-black, elongated outer tail feathers forming long streamers, white patches on inner webs of rectrices (except innermost two pairs); underparts buff with narrow sepia streaks (visible only at close range), undertail-coverts white with buffy tinge; underwing-coverts buffy white. Distinguished from *C. abyssinica* by larger size, darker crown, much finer streaking below. Female has shorter tail than male. Juvenile is duller, crown blacker, rump paler, inner secondaries and wing-coverts with tawny tips, tail shorter. Voice. Song starts with few "chrrp" notes and ends in descending trill; also a "chrrp" and a plaintive "wheep".



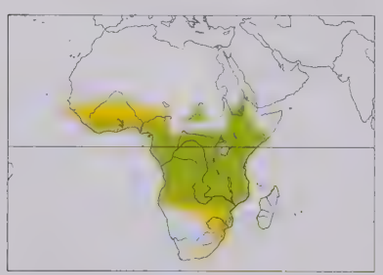
Habitat. Semi-arid karoo, open grassland, including montane grassland above 2000 m; often near water; also cultivation, and human habitations. Avoids wooded areas. Generally at higher elevations than *C. abyssinica*.
Food and Feeding. Diet includes flying ants (Hymenoptera); mulberries (*Morus*) and *Acacia cyclops* seeds occasionally taken, and latter recorded as sometimes fed to nestlings, especially in inclement weather. Feeds alone or in pairs; mixes with other swallows and swifts (Apodidae). Forages usually close to nest-site, and low over ground; flight slow, slower than that of *C. abyssinica*. Also hovers near or clings to acacia pods to extract the seeds. Visits grass fires.
Breeding. Mainly Nov-Mar in Namibia, Nov-Apr in Botswana, Aug-Mar in Zimbabwe and Sept-May (peak Oct-Dec) in South Africa; may have up to three broods, and four recorded in one nest. Solitary, but more than one nest can be present on single building. Male aerial display with shallow wingbeats and song, leads her to nest; throws back head and puffs out throat feathers when singing. Nest built by both sexes, taking 2-3 weeks, enclosed, with tubular entrance, made of mud pellets, lined with grass and feathers; usually affixed high up to underside of horizontal surface of rock face, cave, tree, bridge, culvert, mine, or barn or other building; other nest sometimes used as a base, also nestbox or crevice adapted by addition of entrance tunnel; nests reused in same and successive seasons. Clutch 2-4 eggs, usually 3; incubation by female, period 16-20 days, mostly 18 days; hatching asynchronous, chicks fed by both sexes, fledging period 23-30 days; young return to nest for further 9-22 days. Nest losses due to bad weather, infestation by parasites, i.e. hippoboscid flies (*Ornithomya*), nest falls from corrugated roofs, also nest usurpation by other species, such as White-rumped Swift (*Apus caffer*), which will throw out nestlings, *C. semirufa*, and chats (of genera *Myrmecocichla* and *Thamnolaea*). Oldest recorded bird 6 years 5 months.
Movements. Migratory. Forms small post-breeding flocks of up to 30 individuals. Migrates N in Mar-Apr, spending non-breeding season in Angola, S DRCongo, SW Tanzania and Zambia; recorded also in S PRCongo. May migrate mainly through Namibia and Botswana; may also occur on passage in Zimbabwe; recorded largely on passage in Zambia Apr-May and Sept-Nov. Returns mid-Jul to E South Africa, Aug to Cape and Namibia, and Sept-Oct to Swaziland, KwaZulu-Natal and Botswana. Will return to same nest in successive years, males more so than females.
Status and Conservation. Not globally threatened. Mostly common; scarcer in N & W of range. Readily uses wide variety of artificial nest-sites, which may have allowed its numbers to increase.
Bibliography. Aspinwall (1972), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Britton (1980), Broekhuysen (1960), Clancey (1964b), Dean (2000), Dowsett & Dowsett-Lemaire (1991, 1993), Dowsett & Forbes-Watson (1993), Earlé (1987d, 1987h), Every (1988), Ginn *et al.* (1989), Grobler & Grobler (1988), Harrison *et al.* (1997), Hockey *et al.* (1989), Keith *et al.* (1992), Lippens & Wille (1976), Mackworth-Praed & Grant (1963, 1973), Maclean (1993a), Martin & Pepler (1997a), Oates (1991), Oatley (2002a), Pedersen (2000), Penry (1994), Pepler & Martin (1997), Pringle (1948, 1989), Roos & Roos (1989), Schmidt (1962, 1990), Shillingford (1965), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Stevenson & Fanshawe (2002), Tarboton (2001), Waugh (1978), Woollard & Woollard (1989).

67. **Lesser Striped Swallow**

Cecropis abyssinica

French: Hirondelle striée **German**: Maidschwalbe **Spanish**: Golondrina Abisinia
Other common names: Striped Swallow

Taxonomy. *Hirundo abyssinica* Guérin-Méneville, 1843, Ethiopia.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Often considered to form a superspecies with *C. cucullata*, although ranges overlap widely in S Africa. Race *unitatis* intergrades with nominate in S Sudan and Kenya, and probably overlaps in range with *ampliformis* in S. Six subspecies recognized.
Subspecies and Distribution.
C. a. puella (Temminck & Schlegel, 1845) - Senegambia and Sierra Leone E to N Cameroon.
C. a. maxima (Bannerman, 1923) - SE Nigeria, S Cameroon and SW Central African Republic; also Bioko (Fernando Póo).
C. a. bannermani (C. H. B. Grant & Mackworth-Praed, 1942) - W & SW Sudan and NE Central African Republic.
C. a. abyssinica (Guérin-Méneville, 1843) - E Sudan and Ethiopia.
C. a. unitatis (W. L. Sclater & Mackworth-Praed, 1918) - Equatorial Guinea and Gabon E to S Sudan, Kenya and S Somalia, S to C Angola, E Zambia, Zimbabwe, E Botswana, Mozambique and E South Africa.
C. a. ampliformis (Clancey, 1969) - S Angola and N Namibia E to W Zambia and NW Zimbabwe.



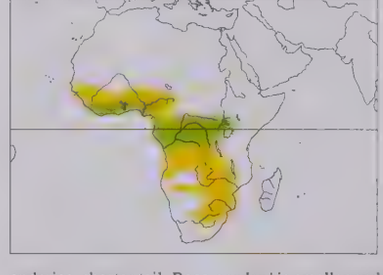
Descriptive notes. 15-19 cm; 16-27 g. Nominate race has forehead to nape, ear-coverts and neck rufous-chestnut, back glossy deep blue, rump and shorter uppertail-coverts rufous-chestnut; wings and tail blackish-brown, elongated outer tail feathers forming long streamers, white patches on inner webs of rectrices (except innermost two pairs), largest on outer two pairs; underparts white with broad sepia streaks, streaks heaviest on throat and upper breast; undertail-coverts white with buffy tinge; underwing-coverts buffy. Distinguished from *C. cucullata* by smaller size, paler rufous crown, bolder streaks below. Female has shorter tail than male. Juvenile is duller, crown darker, rump paler, tawny tips of wing-coverts and inner secondaries, shorter tail. Race *puella* is smaller than nominate, finer streaks on underparts; *maxima* is large, with bold streaks, more chestnut crown; *bannermani* has pale crown, streaks very fine; *unitatis* is large, with bold streaks; *ampliformis* resembles last, but with heavier, blacker streaks. VOICE. Vigorous song, with initial squeaky notes followed by descending nasal ones; also a wheezy "cheeew".
Habitat. Grassland, savanna, open woodland, forest edge and clearings, cultivation and human habitations; less often in mangroves, and river valleys in forested areas. Large roosts (200-300 individuals) recorded in sugar-cane fields. Mostly to c. 2000 m. Occurs in more wooded habitat and at generally lower altitudes than *C. cucullata*.
Food and Feeding. Diet includes Hymenoptera (such as flying ants and bees), beetles (Coleoptera) and flies (Diptera), also lepidopterans; also eats fruit from pigeon wood tree (*Trema orientalis*) and seeds of *Acacia cyclops*. Feeds alone, in pairs, or in flocks of up to 100 individuals, mostly in smaller groups of 5-20; mixes with other hirundines and swifts (Apodidae). Forages at average of 6 m above ground, also often 10-20 m over treetops, and often over water. Flight includes much gliding but can be fast and direct; more manoeuvrable than *C. cucullata*. Also hovers over vegetation to take caterpillars, and feeds around other animals on flushed insects; perches when eating fruit.
Breeding. Mainly in wet season; N of equator mainly Mar-Jul/Aug (e.g. Mar and Jul in Senegambia, from Apr in Liberia, Mar-May in Sierra Leone, Mar-Jul in Togo and Nigeria, Mar-Aug in Ghana and Ethiopia, Jul-Aug in Sudan), but probably all year in Gabon; mostly Feb-Aug and Oct-Dec in E Africa; Jan-Feb and Jun-Nov in Angola, Jul-Oct in DRCongo, May-Aug in W Zambia and Sept-Apr in E, Jul-Feb in Malawi, Mar-Oct in Namibia and N Botswana, most months but mainly Sept-Jan in Zimbabwe (races *unitatis* and *ampliformis* probably overlap in range, but former breeds Aug-May, with peak Aug-Dec, and latter breeds Mar-Oct); May-Aug and Oct-Dec in Mozambique, and Aug-May (peak Nov-Dec) in South Africa; may be double-brooded. Solitary, or in small groups of usually fewer than 10 pairs (one of 50), but up to 70 pairs on bridges; nests in groups usually well spaced, at least 25 cm apart in one. Nest built by both sexes, taking up to 7 weeks, an enclosed bowl with entrance tunnel, made of mud pellets, lined with grass and feathers; usually a couple of metres or more above ground, affixed to underside of horizontal surface of cave, rock, riverbank, cliff, tree, building (either inside or under eaves) or verandah, culvert, mine shaft, well or bridge; old hirundine nest sometimes used as base, then enclosed and tunnel added, in one case a pair of *Hirundo smithii* evicted first; will also add tunnel to nestbox; nests reused, sometimes by different individuals. Clutch 2-4 eggs, usually 3; incubation by female, 14-21 days; chicks fed by both sexes, 3-9 feeds per hour, fledging period 17-28 days; young return to nest for several days to roost. Nests sometimes usurped by White-rumped Swift (*Apus caffer*) and Mocking Cliff-chat (*Thamnolaea cinnamomeiventris*). Oldest recorded bird 5 years 11 months.
Movements. Mainly resident, with some local post-breeding movements, near equator; mainly a wet-season breeding visitor in N & S of range. Forms post-breeding flocks and roosts of up to a few hundred birds. S population migrates N to lower latitudes; a few overwinter in breeding range, e.g. along KwaZulu-Natal coast and the lowveld of E South Africa and Swaziland. In Zimbabwe, migrants appear after breeding population has left. Vagrant in Oman.
Status and Conservation. Not globally threatened. Generally common and widespread; one of the most abundant hirundines in Africa, but sometimes only locally common. Avoids heavily forested areas, and is uncommon in some parts, e.g. Senegambia, Sudan, Botswana, Namibia. Recorded in Liberia only since 1962, now breeding in large groups on bridges; possibly overlooked before. Deforestation and extensive use of artificial nest-sites have probably allowed numbers to increase, but new sites in open country may lead to competition with *C. cucullata* and, possibly, *C. semirufa*.
Bibliography. Ash & Miskell (1998), Aspinwall (1977b, 1980e, 1981a), Bannerman (1953), Benson (1980), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Bowen (1979b), Britton (1980), Brosset & Érard (1986), Brown & Britton (1980), Cheke & Walsh (1996), Christy & Clarke (1994), Clancey (1964b, 1969b), Dean (1974, 2000), Dean *et al.* (1988), Desfayes (1997), Dowsett & Dowsett-Lemaire (1991, 1993), Dowsett & Forbes-Watson (1993), Earlé (1987d, 1988c), Elgood, Fry & Dowsett (1973), Elgood, Heigham *et al.* (1994), Every (1988), Field (1968), Friedmann & Williams (1969), Gatter (1997), Ginn *et al.* (1989), Grimes (1987), Harrison *et al.* (1997), Irwin (1981), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Macdonald (1984), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), McLean (1988), Moreau (1947), Moreau & Moreau (1940), Nikolaus (1987), Oates (1991), Oatley (2002a), Pakenham (1979), Penry (1994), Pérez del Val (1996), Priest (1935), Reynolds (1975), Sclater & Moreau (1933), Serle (1950a, 1950b), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Stevenson & Fanshawe (2002), Tarboton (2001), Urban & Brown (1971), Waugh (1978), Zimmerman *et al.* (1996).

68. **Rufous-chested Swallow**

Cecropis semirufa

French: Hirondelle à ventre roux **German**: Rotbrustschwalbe **Spanish**: Golondrina Pechirrufa
Other common names: Red-breasted Swallow

Taxonomy. *Hirundo semirufa* Sundevall, 1850, Magliesburg, Transvaal, South Africa.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Forms a species group with *C. senegalensis*. Individuals in S part of range of *gordoni* proposed as separate race *neumanni*; further study needed. Nominate varies clinally in tail length in SW, longest in S. Two subspecies recognized.
Subspecies and Distribution.
C. s. gordoni (Jardine, 1851) - Senegambia and Sierra Leone E to CW & S Sudan, Uganda, SW Kenya, extreme NW & N Tanzania and Rwanda, S to N Angola and C DRCongo.
C. s. semirufa (Sundevall, 1850) - SW, C & E Angola, and from S DRCongo, Zambia and W Malawi S to N Namibia, N & E Botswana, NE South Africa and Swaziland.



Descriptive notes. 24 cm; 25-40 g. Has glossy blue-black crown and upperparts, rufous neck side, rump and underparts; wings and tail blue-black, elongated outer tail feathers forming long streamers, white patches on inner webs of rectrices (except central two pairs), largest on outer feathers; underwing-coverts pale rufous. Distinguished from *C. senegalensis* by smaller size, longer tail-streamers, no white on throat, dark of crown extending below eye, white in tail; from *C. daurica* by white spots in tail, lack of rufous collar. Female has shorter tail than male. Juvenile is duller, with paler underparts, buff tips of wing-coverts and secondaries, shorter tail. Race *gordoni* is smaller and less rich rufous than nominate. VOICE. Song is a soft gurgling; also a plaintive "seeur", a short "chip" and an alarm call "weet-weet".
Habitat. Open country, mostly to 1500 m. Grassland, savanna, scrub, woodland clearings, farmland, human habitations, often near water. Found in less wooded areas than those favoured by *C. senegalensis*.
Food and Feeding. Diet includes hymenopterans (flying ants), flies (Diptera), beetles (Coleoptera). Forages in pairs or small groups; large numbers will visit grass fires. Feeds with other swallows, often low over ground; flight slow and buoyant, with frequent gliding. Occasionally hovers over vegetation.
Breeding. In rains in W Africa, e.g. Apr-Aug in Liberia, Apr-Sept in Nigeria, Mar-Jul in Cameroon; Apr-Jul and Oct-Dec in DRCongo, Jul-Aug in Sudan, May-Jun in Uganda, Apr-Jun in Kenya, Oct-

Jan/Feb in Zambia and Malawi, Sept and Feb in Botswana; Aug-Apr in Zimbabwe (peak Oct-Jan) and South Africa (peak Nov-Jan); double-brooded. Monogamous, but bigamous male recorded. Solitary. Nest built by both sexes, in two cases taking 13 and 16 days, retort-shaped with long tunnel entrance, made of mud, lined with grass, wool and feathers; usually within 1 m of ground and in wide variety of natural and artificial sites, including overhanging bank, rock face, culvert, bridge, rafter in house, shed roof, chapel, window, drainpipe, electricity tower, hollow tree, fallen log, termite (Isoptera) mound, aardvark (*Orycteropus afer*) hole, warthog (*Phacochoerus africanus*) hole; nests reused in successive years. Clutch 1-6 eggs, normally 3; incubation by female, sitting for as little as 14% of daylight hours, period 16 days; fledging period 23-25 days; young continue to sleep in nest for up to 15 days. In one study, 80% of 175 eggs hatched, 74% of 140 chicks fledged; 82% of first clutches and 44% of second clutches successful; losses due to desertion, eggs falling from nest, chick starvation; nests sometimes usurped by White-rumped Swift (*Apus caffer*). Oldest recorded bird 5 years 9 months.

Movements. Resident near equator; breeding visitor in N & S of range, migrating mainly to tropical areas. Present mainly Apr-Dec (most frequent Jun-Nov) in Gambia, May-Sept in N Ghana, N Nigeria and Cameroon, Apr-Oct in Sudan; numbers in Liberia lower in Nov-Dec than in other months, highest Jan-Apr. S of equator, occurs mainly Nov-May in Tanzania and Aug/Sept-Mar/Apr in S Africa.

Status and Conservation. Not globally threatened. Varies from uncommon to locally common. Recent expansion to S & E, especially in South Africa, perhaps linked to road construction, with bridges and culverts, housing developments and woodland clearance increasing the availability of breeding habitat. Artificial nest-sites exploited extensively, and in some areas used far more than are natural sites, and species thus benefits from human activities.

Bibliography. Aspinwall (1980d), Bannerman (1939, 1953), Barlow *et al.* (1997), Benson & Benson (1977), Benson *et al.* (1971), Bijnens & Upoki (1992), Borrow & Demey (2001), Brosset & Érard (1986), Brown & Britton (1980), Byaruhanga *et al.* (2001), Cheke & Walsh (1996), Christy & Clarke (1994), Clancey (1964b, 1982, 1990c), Cooper (1963), Dean (2000), Dowsett & Dowsett-Lemaire (1991, 1993), Dowsett & Forbes-Watson (1993), Earlé (1987d, 1987f, 1989), Earlé & Brooke (1989), Elgood *et al.* (1994), Fishpool & Evans (2001), Gartshore *et al.* (1995), Gatter (1997), Ginn *et al.* (1989), Gore (1990), Grimes (1987), Harrison *et al.* (1997), Irwin (1981), Keith *et al.* (1992), Lewis (1982), Lewis & Pomeroy (1989), Lippens & Wille (1976), Louette (1981), Macdonald (1984), Mack (1972), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Nikolaus (1987), Penry (1994), Plowes (1944), Priest (1935), Roberts (1939), Serle (1950a, 1950b), Short *et al.* (1990), Sinclair & Hockey (1996), Stevenson & Fanshawe (2002), Tarboton (2001), Tree (1987), Vincent (1949), Young (1946), Zimmerman *et al.* (1996).

69. **Mosque Swallow**

Cecropis senegalensis

French: Hirondelle des mosquées **German**: Senegalschwalbe **Spanish**: Golondrina Senegalesa
Other common names: African Mosque Swallow

Taxonomy. *Hirundo senegalensis* Linnaeus, 1766, Senegal.

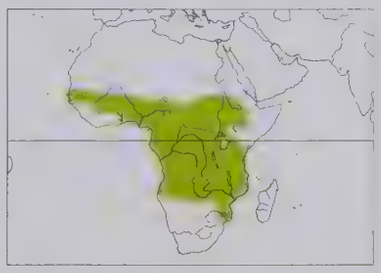
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Forms a species group with *C. semirufa*. Race *saturatior* intergrades with nominate in Sudan and with *monteiri* in SE Kenya (area between Nairobi and Mombasa). Three subspecies recognized.

Subspecies and Distribution.

C. s. senegalensis (Linnaeus, 1766) - extreme S Mauritania and Senegambia E to N Ghana, N Nigeria, N Cameroon, S Chad and SW Sudan.

C. s. saturatior (Bannerman, 1923) - S Ghana E to S Cameroon, S Sudan and Ethiopia and S to PR Congo, N DRCongo, Burundi and N & S Kenya.

C. s. monteiri (Hartlaub, 1862) - Angola and S DRCongo E to S Kenya, S to N Namibia, N Botswana, Zimbabwe, Mozambique and extreme NE South Africa.



Descriptive notes. 24 cm; 38-54 g. Nominate race has glossy purple-blue or steel-blue crown and back, rufous collar which becomes very narrow on hindneck and is sometimes broken by dark blue feather tips, dark rufous rump; wings black with blue gloss, tail glossy blue-black, elongated outer tail feathers forming long streamers; cheeks, chin and throat cream to pale rufous; underparts rufous, paler on breast, and darker on flanks, abdomen and undertail-coverts; underwing-coverts creamy white to pale fawn. Distinguished from *C. semirufa* by larger size, shorter tail-streamers, whiter underwing-coverts, no white tail patches; from *C. daurica* by larger size, paler throat and underwing-coverts, rufous undertail-coverts. Female has shorter tail than male. Juvenile is duller, browner above with rufous areas paler, tips of tertials, inner secondaries and uppertail-coverts pale rufous, shorter tail. Race *saturatior* is darker than nominate; *monteiri* is dark, has white patches in tail. Voice. Song is rambling mix of nasal, whining and creaking notes; calls include a nasal "nyaa" contact call, a distinctive piping "pyuuuu" and a "mew" and "weh".

Habitat. Grassland, savanna, bush, woodland, especially mopane woodland, clearings in forest, rivers, cultivation, also human habitations. To c. 2800 m. Compared with *C. semirufa*, found in more wooded areas and less often near human habitation.

Food and Feeding. Diet includes Hymenoptera (flying ants), termites (Isoptera), flies (Diptera). Feeds alone or in small groups, mixes with other hirundines; attends grass fires in larger groups, up to 100 individuals. Forages 20-30 m above trees or over water; flight gliding, alternating with short periods of flapping.

Breeding. Before and during rains in W Africa, e.g. Jul-Oct and Dec in Senegambia, Jan, Apr-Jul and Oct in Ghana, May-Aug in Nigeria and Feb-Sept in Cameroon; Apr, Jul and Nov in Ethiopia; mainly in rains in E Africa, e.g. Apr-May and Dec in Kenya, Feb-Jul and Oct-Dec in Uganda, and Jan-Feb, Apr, Oct and Dec in Tanzania; Apr-Jul in DRCongo, Nov-Jan in Angola, Aug-Apr in Zambia, Aug-May in Zimbabwe, and most months in South Africa; may be double-brooded. Solitary, nests well spaced out. Nest built by both sexes, taking up to 4 weeks, retort-shaped with long tunnel entrance, made of mud, lined with grass and feathers; species sometimes builds up a hole with mud, rather than making a full nest; nest often in hole in tree, especially baobab (*Adansonia*), alternatively in riverbank, termite mound, cliff, cave, bridge, culvert, or inside or on building; old nests of own or other species often repaired and reused. Clutch 2-4 eggs, usually 3; incubation and fledging periods not documented; fledglings roost in nest, sometimes over a period lasting several weeks.

Movements. Mainly resident, especially in S; partly migratory in some areas, and often present mainly in wet season N of equator. In W Africa present mainly May-Oct in Senegambia, Feb-Aug in Togo, Mar-Jun in Benin; in Nigeria, Feb-Jul in N and Jan-May in S. In extreme S parts of range, possibly some post-breeding movement out of N Namibia and Botswana; only a breeding visitor Aug-Apr to Mashonaland (N Zimbabwe).

Status and Conservation. Not globally threatened. Generally considered to be scarce or only locally common, especially in S of range; common in some areas, e.g. Ghana, E Africa, Zambia, Zimbabwe. Has recently spread S in Zimbabwe and in NE South Africa (Kruger National Park). Utilizes artificial nesting sites to only a limited extent; when nesting in buildings, prefers those that are uninhabited.

Bibliography. Aspinwall (1980b), Bannerman (1939, 1953), Barlow *et al.* (1997), Barry (1998), Beesley (1972), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Britton (1980), Brooke (1984a), Brosset & Érard (1986), Brown & Britton (1980), Byaruhanga *et al.* (2001), Clancey (1964b), Dean (2000), Dowsett & Dowsett-Lemaire (1991, 1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1973), Fishpool & Evans (2001), Ginn *et al.* (1989), Gore (1990), Grimes (1987), Harrison *et al.* (1997), Irwin (1981), Keith *et al.* (1992), Lewis & Pomeroy (1989), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Nikolaus (1987), Penry (1994), Pitman (1931), Salvan (1969), Sclater & Moreau (1933), Short *et al.* (1990), Sinclair & Hockey (1996), Stevenson & Fanshawe (2002), Tarboton (2001), Urban & Brown (1971), Verheyen (1953), Waugh (1978), Winterbottom (1942), Zimmerman *et al.* (1996).

70. **Red-rumped Swallow**

Cecropis daurica

French: Hirondelle rousseline **German**: Rötelschwalbe **Spanish**: Golondrina Dáurica
Other common names: Golden-rumped Swallow; Black-vented Swallow (*melanocrissus*); Ceylon Swallow, Sykes's Striated Swallow (*hyperythra*); Lesser Striated Swallow (*daurica, japonica, erythropygia*); West African Swallow/Striated Swallow, Lowland Swallow (*domicella*)

Taxonomy. *Hirundo daurica* Laxmann, 1769, Mount Schlangen, near Zmeinogorsk, Altai, Russia.

Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Forms a superspecies, and sometimes treated as conspecific, with *C. striolata* and *C. badia*, the three replacing each other geographically; race *japonica* is intermediate between former species and nominate race of present species. W & NE African race *domicella* sometimes considered a separate species; taxonomic status of Sri Lankan *hyperythra* also requires review. Proposed races *disjuncta* (from Birwa Plateau, in Sierra Leone) and *gephyra* (W Inner Mongolia S to E Tibet and Sichuan) are probably indistinguishable from, respectively, *kumboensis* and nominate. Ten subspecies currently recognized.

Subspecies and Distribution.

C. d. rufula (Temminck, 1835) - SW & S Europe (Iberian Peninsula, Mediterranean countries) and N Africa E to S Asia Minor, Levant (S to Israel), NE Saudi Arabia, W & S Iran, Pakistan, NW India and Tien Shan; winters Africa and SW Asia.

C. d. daurica (Laxmann, 1769) - NE Kazakhstan E to SE Russia (W Amurland) and N Inner Mongolia, S to SC China (S to N Yunnan); winters S & SE Asia.

C. d. japonica (Temminck & Schlegel, 1845) - E Amurland, NE, E & S China, Korea and Japan; winters SE Asia S to N Australia.

C. d. nipalensis (Hodgson, 1837) - Himalayas E to SE Xizang (Tibet) and N Myanmar; winters India.

C. d. erythropygia (Sykes, 1832) - India from Punjab E to West Bengal, and S; winters S India and Sri Lanka.

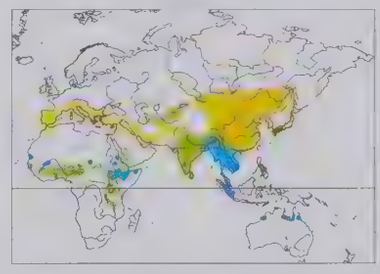
C. d. hyperythra (Blyth, 1849) - Sri Lanka.

C. d. domicella (Hartlaub & Finsch, 1870) - Africa from Senegambia and Guinea E to Sudan and SW Ethiopia.

C. d. kumboensis (Bannerman, 1923) - Sierra Leone (Birwa Plateau) and W Cameroon (Bamenda Highlands).

C. d. melanocrissus Rüppell, 1845 - highlands of Ethiopia and Eritrea.

C. d. emini (Reichenow, 1892) - SE Sudan, Uganda and C Kenya S to N Zambia and Malawi.



Descriptive notes. 16-17 cm; 19-29 g. Distinctive. Nominate race has glossy deep blue crown and back separated by incomplete chestnut collar, chestnut rump with fine dark streaks; wings and tail blackish with some gloss, outer tail feathers elongated; underparts buffy with long dark streaks, undertail-coverts black; underwing-coverts creamy buff. Distinguished from most other hirundines by combination of chestnut collar and rump, black undertail-coverts, absence of white in tail and of breastband; from *C. striolata* by smaller size, less heavy streaking, clearer hindcollar. Female has shorter tail than male. Juvenile is duller, browner above, rufous areas paler, streaking less distinct, wing feathers tipped buff, shorter tail. Races differ mainly in extent of streaking and colour of rump and underparts (varying from white to chestnut), and presence of collar on hindneck: *japonica* has faint streaks on rump, heavily streaked underparts, broadly interrupted collar; *nipalensis* has underparts pale rufous and well streaked, collar sometimes interrupted; *erythropygia* has dark rump, buffish-white underparts with narrow streaks, collar usually interrupted; *hyperythra* has deep rufous underparts with no or faint streaks, no distinct collar; *rufula* has pale rufous underparts, narrow streaks and complete collar; in Africa, *domicella* has white or pinkish-buff underparts with little streaking, *melanocrissus* is buffy below with small streaks only on breast, *emini* has pale rufous underparts without streaks, and *kumboensis* is intermediate between previous two. Voice. Short twittering song; calls include a contact call "djuit", a mewing territorial call, a short alarm call and an aggressive "krr" call.

Habitat. Open hilly country and mountains, river gorges, valleys, sea cliffs, cultivation, and human habitations, including towns. Sea-level to 800 m, rarely to 1600 m, in Europe; elsewhere to c. 3500 m. In non-breeding season, occurs in grassland, cultivation and forest clearings, and roosts in reedbeds.

Food and Feeding. Adult diet includes flies (Diptera), beetles (Coleoptera), bugs (Hemiptera), termites (Isoptera), Orthoptera, Hymenoptera. In a study of 25-day-old nestlings of race *rufula*, 94% of diet was flying ants, rest of diet consisting of other hymenopterans, dipterans, coleopterans and a cockroach (Blattaria); nestlings in Uzbekistan were fed on cicadas (Cicadidae) and coleopterans. Forages usually alone, in pairs or in small groups; mixes with other hirundines. Feeds both low over vegetation and high up; flight slow, with frequent gliding and soaring. Patrols cliff face or other feeding route. Sometimes feeds around human settlements and similar sites that attract insects, including markets, bazaars and shipping docks. Will perch on vegeta-

tion or ground to pick up insects, including flies from camel dung. Visits grass fires in Indian Subcontinent.

Breeding. Apr-Sept in Europe, mainly Apr-Aug in Himalayas, India and Sri Lanka, Jun-Jul in E Asia, May-Aug in Japan; in Africa, Apr-Jul in N, mainly Oct-May in W, Jan and Apr-Aug in Ethiopia and Mar-Jul in E; two broods usual, in Spain often three (21% of 65 pairs). Usually solitary, sometimes loose groups of a few pairs, rarely up to 50 pairs and one record of 100; nests in groups sometimes clustered, but often dispersed (2-3 m apart) as pairs aggressive towards each other, e.g. one group of four had nest entrances at least 29 cm apart; record of eight nests in different rooms of a building. Displaying male circles, with calling, around female, if she perches he may perch nearby and sing, sometimes displaying tail. Nest built by both sexes, taking 1-2 weeks, enclosed, with tunnel entrance, made of mud pellets, sometimes with a little dry grass admixed, lined with mixture of white feathers, hair, plant down, leaves, pine (*Pinus*) needles or dry grass; nest of *Hirundo rustica* sometimes taken over and built up; placed 0·5-20 m above ground, usually 2-4·5 m (1·5-4·3 m when on a bridge), usually affixed to underside of horizontal surface of natural or artificial site, e.g. cliff, rock face, cave, culvert, bridge, drainage pipe, military bunker, bus shelter, verandah, under eaves or in stairwell or corridor of building, unoccupied farm building; nests reused in same and successive seasons. Clutch size varies regionally, 2-7 eggs (mainly 4-5) in Europe, 5 or 6 in Siberia, generally 3 or 4 (occasionally 5) in Asia but only 2 or 3 in Sri Lanka, and 2-3 in Africa; of 135 clutches in Spain, 46% were of 4 eggs, 29% of 5, 15% of 3, 5% of 2, 4% of 6, 1% of 7; also seasonal decline, e.g. in Spain mean size of first clutch 4·51, of second 3·8, of third 3·6; incubation by both sexes, female doing more, starts from last egg, period 11-16 days, mostly 14-15 days; chicks fed by both parents, more by female in later stages, in Spain 53 nest visits per day at 3 days, 72 at 8 days, 138 at 13 days, 82 at 18 days, and in Bulgaria hourly feeding rate 9·4 on day 5, 22·8 on day 10, 24·5 on day 15; nestling period 26-27 days, but as few as 20 days recorded; fledglings fed by parents for at least 5-6 days, remain with them for 8-9 days, and roost in nest for 2-3 weeks after fledging. Breeding success in Spain 74·4%, average 6·38 fledglings per pair per season; nests often usurped by House Sparrow (*Passer domesticus*) and sometimes by White-rumped Swift (*Apus caffer*). Oldest recorded bird c. 8 years.

Movements. Migratory in N parts of range, but mostly resident in S. Forms small post-breeding flocks of tens or hundreds of birds, often with other hirundines and swifts (Apodidae). Present on N breeding grounds mainly during period Mar/Apr-Sept/Oct; individual winter ranges unclear, as races overlap and are difficult to distinguish in field, but together extend from Africa across to SE Asia and S recently to N Australia. Migrants recorded across N Africa, but rare in Tunisia and Libya; European and W Asian breeders presumed to winter in savanna belt of N Afrotropics; those from Spain and Morocco may winter on W side and those from SE Europe and SW Asia on E side. Pronounced passage across Strait of Gibralter in Apr and Sept and through E Mediterranean in Mar-Apr and Sept. E Asian races (nominate, *japonica*) recorded in winter from Nepal and NE India E to SE Asia, but only scarce in areas S from Indochina and W Malaysia; first recorded in N Australia in 1983, presumably *japonica* (one confirmed as such). Older birds return to breeding grounds singly or in pairs, and arrive before younger individuals. Largely resident in Africa, India, Sri Lanka and parts of S China and Japan, but some post-breeding movements in e.g. Sudan and Nigeria and occurs seasonally in some E African localities; Himalayan *nipalensis* moves to lower altitudes after breeding. Frequent vagrant outside range, e.g. in Europe N to British Is (regular since 1964), Netherlands, Poland, Scandinavia and Iceland, and in Atlantic Ocean on Azores and Canary Is.

Status and Conservation. Not globally threatened. Common in most of range; uncommon to locally common in W Africa; rather local in E Africa, where occurs in several protected areas in Tanzania. Population sizes poorly known; estimated at perhaps 63,000 pairs in Europe, where majority of population in Iberia and Balkan Peninsula. Is extending its range and increasing its use of artificial nest-sites, although less dependent on them than is *Hirundo rustica*; common in towns in sub-Saharan Africa, but in some parts of range, e.g. Pakistan, nests mainly on natural rock faces. In Israel has spread since 1960s from mountainous areas to lowland settlements. Range in Europe has extended N since 1920s in Iberia (now frequently nests on bridges) and since c. 1950s in Balkans; first bred C Spain 1951-1953, N Spain 1960, Corsica 1962, mainland France 1965, Sardinia 1965, Romania 1975, and recently bred in Slovenia; large expansion 1970-1990 in Portugal, Bulgaria and Romania, and smaller expansion in France since 1980s. In Japan has extended range N since 1950s, into N Honshu and Hokkaido.

Bibliography. Adamian & Klem (1999), Ali & Ripley (1987), Bannerman (1953), Barlow *et al.* (1997), Benson & Benson (1977), Benson *et al.* (1971), Benussi (1991), Borrow & Demey (2001), Brazil (1991), Britton (1980), Brosset & Érard (1986), Bury & Huin (1998), Campbell (1977), Carey *et al.* (2001), Carter (2000), Cheke & Walsh (1996), Cheng Tsohsin (1964), Cramp (1988), Dementiev *et al.* (1968), Dickinson & Ericson (2002), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood, Fry & Dowsett (1973), Elgood, Heigham *et al.* (1994), Étchécopar & Hüe (1964, 1983b), Fasola *et al.* (1997), Fraticelli & Petretti (1991), Frias & Kahlert (1999), Gatter (1997), Géroudet (1979), Glutz von Blotzheim & Bauer (1985), Goodman *et al.* (1989), Gore (1990), Grimmett *et al.* (1998), Grünhagen & Mebs (1987), Hagemeijer & Blair (1997), Harvey (1980), Heath *et al.* (2000), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Isenmann & Nicolau-Guillaumet (1992), Jennings (1995), Jones *et al.* (1998), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), de Lope (1980, 1981a, 1981b, 2003b), MacKinnon & Phillipps (1993, 2000), Mackworth-Praed & Grant (1960, 1963, 1973), van Marle & Voous (1988), Martín & Lorenzo (2001), McClure (1998), Meinertzhagen (1954a), Merino *et al.* (2001), Morel & Morel (1992), Moreno (1986), Nakama (1984), Nicolau-Guillaumet (1965, 1999b), Nikolaus (1987), Orta & Romero (1990), Palmgren *et al.* (1978), Paz (1987), Pearson & Lack (1992), Prodon (1982), Rabacci (1981), Riols (1978), Roberts (1992), Rufray *et al.* (2002), Ryan *et al.* (1999), Shirihai (1996), Short *et al.* (1990), Show (1930), Simeonov (1968, 1969), Simeonov & Michev (1980), Snow & Perrins (1998), Stepanyan (1990), Stipcevic & Kletecki (1988), Stipcevic & Lukac (1991, 1992), Tellería *et al.* (1999), Urban & Brown (1971), Valverde (1957), Vasic *et al.* (1980), Vaurie (1951b), von Wicht (1978), Zhang Shoufu *et al.* (1989), Zimmerman *et al.* (1996).

71. Striated Swallow

Cecropis striolata

French: Hirondelle striolée **German**: Strichelschwalbe **Spanish**: Golondrina Estriada
Other common names: Eastern Red-rumped Swallow, Greater/Larger Striated Swallow, Mosque(!)/Oriental Mosque Swallow

Taxonomy. *Hirundo striolata* Schlegel, 1844, Java.

Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Forms a superspecies with *C. daurica* and *C. badia*, the three replacing each other geographically; sometimes treated as conspecific with former, race *japonica* of which is intermediate between nominate race of that species and present species; often considered conspecific also with *C. badia*, but recent review suggests that they are separate species. Four subspecies recognized.

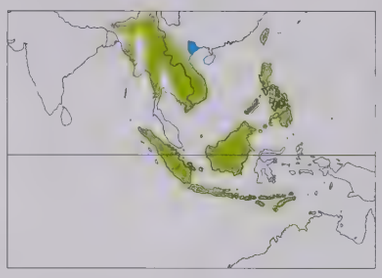
Subspecies and Distribution.

C. s. mayri (B. P. Hall, 1953) - NE Bangladesh, NE India, N Myanmar and S China (SW Yunnan); winters N, E & S Myanmar, NW Thailand and Vietnam (E Tonkin, C Annam).

C. s. stanfordi (Mayr, 1941) - N, E & S Myanmar, NW & NE Thailand, Laos, Cambodia, C & S Annam and Cochinchina.

C. s. vernayi (Kinnear, 1924) - S Myanmar (N Tenasserim) and W Thailand.

C. s. striolata (Schlegel, 1844) - Taiwan, Philippines, Greater Sundas, and Lesser Sundas E to Wetar and Timor.



Descriptive notes. 19 cm; 22 g. Nominate race has crown and back glossy steel-blue, rufous hindcollar poorly defined or absent; rump chestnut with narrow streaks, shorter uppertail-coverts chestnut, longer ones black with blue gloss; wings and tail blackish-brown with slight blue gloss, tail deeply forked; cheeks white with sepia streaks, underparts white with heavy streaking, densest on chin and throat; undertail-coverts blackish-brown; underwing-coverts white with buffy wash. Differs from *C. daurica* in larger size, heavier streaking, lack of clear collar; from *C. badia* in smaller size, whiter and more streaked underparts. Sexes alike. Juvenile is duller than adult, browner above, rufous areas paler, buff tips of wing-coverts and tertials, shorter tail. Races differ mainly in extent of streaking and colour of underparts: *mayri* has broader streaks than nominate; *stanfordi* is as broadly streaked as previous, has well-defined black area near thighs; *vernayi* has rusty chestnut wash on underparts. Voice. Song is a soft twittering; calls include a "pin" or "quitsch" uttered in flight.

Habitat. Open hilly country, river gorges, forest clearings, cultivation, and human habitations. To c. 2560 m.

Food and Feeding. Diet includes dipteran flies (such as mosquitoes) and cicadas (Cicadidae). Feeds alone or in small groups, sometimes with other hirundine species. Flies slowly, low over ground or along cliff face, but sometimes very high in air.

Breeding. Apr-Jul. Solitary or in small, loose groups. Nest-construction can take several weeks, nest enclosed, with long tunnel, made of mud pellets, lined with dry grass and a few feathers; attached to horizontal surface on rock face, cave roof, bridge, culvert, in house close to ceiling, under eaves of building, or on verandah. Clutch 3-5 eggs, usually 4; no information on incubation and fledging periods.

Movements. Largely resident in E & S (nominate race and *vernayi*). Elsewhere perhaps a partial migrant; NW race (*mayri*) has been recorded in non-breeding season farther S in E & S Myanmar, NW Thailand and Vietnam (E Tonkin and C Annam), and *stanfordi* in Tonkin.

Status and Conservation. Not globally threatened. Common in SE Asia, where possibly more widespread than is indicated by confirmed breeding records; locally common in Philippines; generally common in China (SW Yunnan) and Taiwan. Uncommon in Sundas, occurs in Baluran National Park, in E Java; status on Borneo uncertain. Rare in Bangladesh and NE India, where very few recent records, but possibly overlooked owing to confusion with *C. daurica*. In areas where common, has benefited from presence of artificial nest-sites such as bridges.

Bibliography. Ali & Ripley (1987), Allen (1948), Carter (2000), Coates (1990), Coates & Bishop (1997), Duckworth *et al.* (1999), Étchécopar & Hüe (1983b), Finch (1983), Gregory *et al.* (1996), Grimmett *et al.* (1998), Jones *et al.* (1994), Kennedy *et al.* (2000), Kotagama (1985), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Mayr (1944), Ripley (1982), Robson (2000), Smythies (1986, 1999), Stepanyan (1995), Strange (2001), Tsai Hangyeh (1985), Vaurie (1951b), White & Bruce (1986).

72. Rufous-bellied Swallow

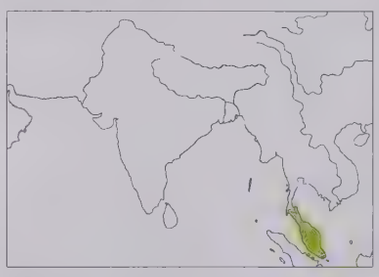
Cecropis badia

French: Hirondelle baie **German**: Thaischwalbe **Spanish**: Golondrina Ventrirrufa

Taxonomy. *Cecropis badia* Cassin, 1853, Malacca, West Malaysia.

Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Forms a superspecies with *C. daurica* and *C. striolata*, the three replacing each other geographically; often treated as conspecific with those, especially latter, but recent review suggests that they are separate species. Monotypic.

Distribution. Malay Peninsula.



Descriptive notes. 19-20 cm. Has crown and back glossy steel-blue, rufous hindcollar poorly defined or absent, rump unstreaked chestnut; wings and tail blackish-brown with slight blue gloss, tail deeply forked; underparts and underwing-coverts deep rufous with faint streaking. Distinguished from *C. striolata* by larger size, redder underparts, less streaking. Sexes alike. Juvenile is duller than adult, browner above, rufous areas paler, shorter tail. Voice. Song is a soft twittering or warble; also makes a single "tweep" or "pin", a sharp "cheenk", and a trembling "schwirrrr"; alarm call is a repeated "chi-chi-chi".

Habitat. Open hilly country, rocky outcrops. Forages over open country and forest. Occasionally seen around isolated buildings.

Food and Feeding. Dietary details not known; probably similar to those for *C. daurica* and *C. striolata*. Often feeds in flocks with other swallows.

Breeding. Eggs and nestlings recorded in Jun. Solitary. Nest enclosed, with long tunnel, made of mud pellets, lined with dry grass and few feathers, attached to horizontal surface on rock face. Clutch of 2 eggs recorded; no further information.

Movements. Resident.

Status and Conservation. Not globally threatened. Common. Relatively poorly known species, chiefly because it was until recently treated as a race of *C. striolata* or of more widespread and better-studied *C. daurica*.

Bibliography. Allen (1948), Dickinson & Dekker (2001b), Hawa (1985), Jeyarajasingam & Pearson (1999), Madoc (1976), Medway & Wells (1976), Riley (1938), Robinson (1927), Vaurie (1951b), Wells (1990).

PLATE 69 ➤

PLATE 69

inches 3

cm 8

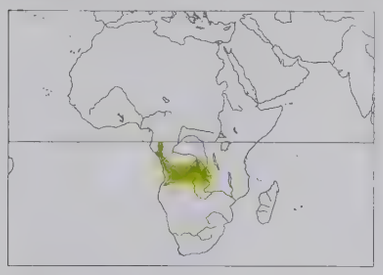
Genus *PETROCHELIDON* Cabanis, 1850

73. Red-throated Swallow

Petrochelidon rufigula

French: Hirondelle à gorge fauve **German**: Rotkehlschwalbe **Spanish**: Golondrina Gorgirroja
Other common names: Angola/Red-throated Cliff Swallow, (Angolan) Rock Swallow

Taxonomy. *Hirundo rufigula* Bocage, 1878, Caconda, Angola.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Forms a superspecies with *P. preussi*, and has been considered conspecific, but distinct plumage differences exist between them. Also, sometimes considered conspecific with *P. spilodera*. Monotypic.
Distribution. Gabon and S PRCongo S to C Angola, thence E to S DRCongo and NW Zambia.



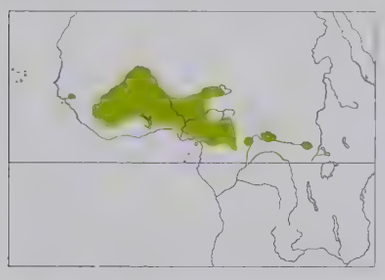
Descriptive notes. 12 cm; c. 16 g. Has crown and upperparts glossy deep blue, hindneck and mantle with faint white streaks, rump rufous; wings and tail blackish-brown, tail slightly forked, white patches on inner webs of rectrices (except central pair); chin, throat and upper breast rufous, lower breast, abdomen, flanks and underwing-coverts buff, shorter undertail-coverts rufous, longer ones black with buff edges. Differs from *P. spilodera* in smaller size, blue (not rufous) forehead, plain rufous throat. Sexes alike. Juvenile is duller, browner, with rufous areas paler, pink wash on abdomen. Voice. Twittering song; harsh "tre-tre-tre" uttered in flight.
Habitat. Open grassland and cultivation, often near water and cliffs; locally also at bridges over large forest rivers. Lowlands.
Food and Feeding. Diet includes flies (Diptera). Forages usually in flocks, often with other hirundines and swifts (Apodidae), up to 30 km from nest-site. Flight fluttery and slow, with frequent gliding.
Breeding. Jul-Oct in Angola, Apr and Jun in DRCongo and Apr and Sept-Oct in Zambia. Colonies of tens or hundreds of pairs, up to c. 400, nests abutting each other. Nest enclosed, with short tubular entrance, made of mud pellets, lined with grass, placed mainly under bridge or other artificial structure, less often in natural site (cliff face, cave). Clutch 1-3 eggs; no information on incubation and fledging periods. Nests sometimes taken over by White-rumped (*Apus caffer*) and Little Swifts (*Apus affinis*).
Movements. Mainly resident or partial migrant; migratory in SE, occurring in Zambia Apr to early Dec.
Status and Conservation. Not globally threatened. Locally common. First colonized Gabon in late 1970s, continuing to expand N there; appears to be extending range also in Zambia. Expansion probably result of increased availability of nest-sites; spread into S Gabon followed construction of bridges.
Bibliography. Aspinwall & Beel (1998), Bannerman (1953), Benson (1982), Benson *et al.* (1971), Borrow & Demey (2001), Bowen (1978, 1979a), Brosset & Érard (1977), Cannell (1968), Chapin (1953), Christy (1984), Christy & Clarke (1994), van Daele (1999), Dean (1974, 2000), Dowsett (1989), Dowsett & Dowsett-Lemaire (1980, 1991, 1993, 1997), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Hall (1960), Keith *et al.* (1992), Lippens & Wille (1976), Mackworth-Praed & Grant (1963, 1973), Pedersen (2000), Taylor (1979a), Tree (1964).

74. Preuss's Swallow

Petrochelidon preussi

French: Hirondelle de Preuss **German**: Rostschläfenschwalbe **Spanish**: Golondrina de Preuss
Other common names: Preuss's Cliff Swallow

Taxonomy. *Lecythoplastes preussi* Reichenow, 1898, Sanaga River near Edéa, Cameroon.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Forms a superspecies with *P. rufigula*, and has been considered conspecific, but distinct plumage differences exist between them. Monotypic.
Distribution. Guinea-Bissau, Sierra Leone, NE Guinea and S Mali E to Nigeria, Cameroon and SW & S Central African Republic, also NW & NE DRCongo.



Descriptive notes. 12 cm; 12-14 g. Has glossy deep blue crown and ear-coverts, rufous patch behind eye, upperparts glossy deep blue with grey-white streaks, rump creamy buff; wings and tail blackish-brown, tail slightly forked, white patches on inner webs of rectrices (except central pair), patches small or sometimes absent on outer pair; throat, cheeks and underparts, including underwing-coverts, buff. Differs from somewhat similar *Delichon urbicum* in darker, buffier rump and underparts, white in tail, rufous on head. Sexes alike. Juvenile is duller than adult, browner, chin to breast pinkish-brown, abdomen white with pinkish wash, undertail-coverts grey-brown. Voice. Noisy twittering song; a "prrp-prrp" uttered in flight and a "pseep" alarm call.
Habitat. Savanna and cultivation, usually near cliffs and rivers.
Food and Feeding. Diet includes Hymenoptera (flying ants). Feeds in often large flocks; mixes with other hirundines and swifts (Apodidae). Forages sometimes low down, but also very high up; flight slow and fluttery, with much gliding.
Breeding. At end of dry season, mainly Feb-Jun; Nov-Jul in Mali; May-Jun, Dec-Jan and probably also Feb-Apr in Ghana; Feb-Jul in Togo and Nigeria. Colonies of tens to thousands of pairs, up to c. 2500, sometimes divided into smaller clusters, nests closely packed and abutting one another. Nest-building by both sexes, can start several weeks before eggs laid, nest bottle-shaped, enclosed, with long, tubular, downward-curving entrance, made of mud pellets, lined with grass, seeds and feathers; usually underneath horizontal surface, often over water, on rock, cliff, culvert, dam, mine shaft, bridge or building; large colonies sited particularly on bridges. Clutch 2-3 eggs; incubation and fledging periods not documented. Nests over rivers sometimes destroyed by floods.
Movements. Resident or partial migrant. Forms large flocks and disperses after breeding. Movements poorly known; irregular in Nigeria, in N present only in rains; absent Aug-Dec in Togo. Does not return to same areas to breed each year.
Status and Conservation. Not globally threatened. Rare to locally common; irregularly distributed. May have benefited from creation of new artificial nest-sites, such as culverts and bridges, which are readily used. Has apparently recently extended range into Sierra Leone, although possibly previously overlooked there.
Bibliography. Ash *et al.* (1989), Ashford (1968), Bannerman (1939, 1953), Bannerman & Bates (1926), Borrow & Demey (2001), Broadbent (1969b), Chapin (1953), Cheke & Walsh (1996), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Gatter (1997), Germain *et al.* (1973), Grimes (1987), Jourdain & Shuel (1935), Keith *et al.* (1992), Lamarche (1981), Louette (1981), Mackworth-Praed & Grant (1973), Pedersen (2000), Serle (1940, 1965), Tye (1985).

75. Red Sea Swallow

Petrochelidon perdita

French: Hirondelle de la Mer Rouge **Spanish**: Golondrina del Mar Rojo
German: Rotmeerschwalbe
Other common names: Red Sea Cliff Swallow

Taxonomy. *Hirundo perdita* Fry and D. A. Smith, 1985, Sanganeb lighthouse, Red Sea north-east of Port Sudan, Sudan.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Forms a superspecies with *P. spilodera*. Monotypic.
Distribution. Unknown; possibly breeds in Red Sea hills of Sudan or Eritrea, or in coastal hills of W Saudi Arabia (N of Jedda).



Descriptive notes. c. 14 cm. Has forehead and lores blackish, crown blue-black, back glossy deep blue, rump grey-white; wings and tail blackish-brown, tail square-ended; chin with white spot, throat and upper breast bluish-black, rest of underparts off-white, buffy undertail-coverts; underwing-coverts white. Differs from *P. spilodera* in colour and pattern of head to breast, grey rump. Juvenile unknown. Voice. Unknown.
Habitat. Unknown; possibly open grassland, mountainous areas, cliffs, as for other members of genus.
Food and Feeding. Unknown. Unidentified swallows, possibly of this species, observed in Ethiopia were feeding over grassland with other hirundines, and along cliffs; flight fluttering, with frequent turns.
Breeding. Unknown. Single specimen, found in May, appeared to have completed moult, suggesting possible breeding in early part of year.
Movements. Unknown.
Status and Conservation. Not globally threatened. Data-deficient. Known only from single type specimen, found dead in May 1984. Range unknown. Unidentified hirundines recorded several times in Ethiopia (e.g. 20 at L Langano, up to 12 in Awash National Park, also at three other sites) were possibly of this species or, perhaps more likely, belonged to another, as yet undescribed taxon; features included whitish (not blue-black) throat and upper breast, dark (not pale) chin, and buffy to pale rufous (not grey) rump. Otherwise, two pale-rumped swallows seen at sea as they flew towards Jedda may also have been of present species.
Bibliography. Atkins & Harvey (1994), Collar & Andrew (1988), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Fry & Smith (1985), Keith *et al.* (1992), Madge & Redman (1989), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Vuilleumier *et al.* (1992).

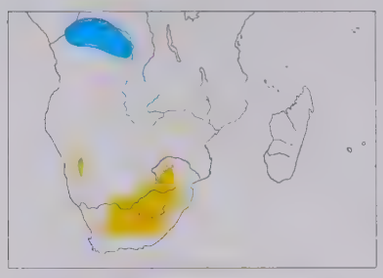
76. South African Swallow

Petrochelidon spilodera

French: Hirondelle sud-africaine **German**: Klippenschwalbe **Spanish**: Golondrina Sudafricana
Other common names: South African Cliff Swallow

Taxonomy. *Hirundo spilodera* Sundevall, 1850, Valsch River, Free State, South Africa.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Forms a superspecies with *P. perdita*. Sometimes considered conspecific with *P. rufigula*. Monotypic.
Distribution. Breeds Namibia, Zimbabwe, South Africa (Eastern, Free State and E Cape Provinces, also NW KwaZulu-Natal); migrates N to SE PRCongo and W DRCongo.
Descriptive notes. 14 cm; 16-26 g. Has pale rufous forehead and lores, dark brown crown, black head side and hindneck; upperparts deep blue-black, whitish streaks on mantle, rump pale rufous; wings and tail blackish-brown, tail square-ended; throat pale rufous to whitish, variable amount of dark speckling; underparts variable, usually rufous on breast and undertail-coverts, whitish on belly and flanks, with varying amount of dark speckling on upper breast and of streaking elsewhere; underwing-coverts pale rufous. Sexes alike. Juvenile is duller, with rufous areas paler. Voice. No clear song; calls are a warbling chatter call, a threat call which is a harsher version of the chatter call, a nest-relief call, low- and high-intensity alarm calls, a distress call and a whistle-like contact call.
Habitat. Open grassland, lightly wooded savanna and semi-arid karoo.

On following pages: 77. Forest Swallow (*Petrochelidon fuliginosa*); 78. Streak-throated Swallow (*Petrochelidon fluvicola*); 79. Fairy Martin (*Petrochelidon ariel*); 80. Tree Martin (*Petrochelidon nigricans*); 81. Cliff Swallow (*Petrochelidon pyrrhonota*); 82. Cave Swallow (*Petrochelidon fulva*); 83. Chestnut-collared Swallow (*Petrochelidon rufocollaris*).



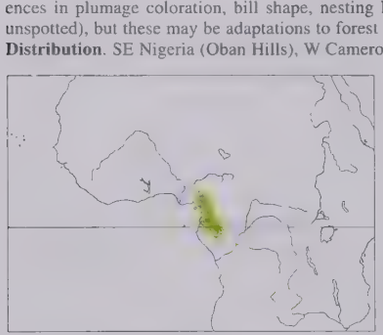
Food and Feeding. Diet includes beetles Coleoptera (especially Scarabaeidae and Curculionidae), dipterans (especially Muscidae and Drosophilidae), bugs (Hemiptera), Hymenoptera (flying ants and parasitic wasps), lepidopterans, termites (Isoptera) and spiders (Araneae); flightless prey include carabid beetles, beetle and moth larvae, termites, spiders. Forages alone or in flocks of 10-50, sometimes with other hirundines. Feeds at range of heights, often high up, but in one study at average of 2 m above ground. Flight fast, with short glides when foraging. Hovers over bushes to flush insects, also feeds around other animals, follows plough and visits bush fires. Recorded as feeding on ground and from vegetation more often than do other hirundines.
Breeding. Sept-Apr; two or three broods reported for small proportion of pairs. Colonies of a few tens to several hundreds of pairs, up to c. 1300 recorded, sometimes mingled with Little Swift (*Apus affinis*) colonies; nests often abut one another; defends area around nest entrance. Male starts to build ledge for nest, crouches on nest and sings to attract mate, displays tail and quivers wings when female perches; copulation at nest-site. Nest-building by both sexes, can take a week, nest enclosed, with short, downward-facing tubular entrance near top, made of mud pellets, lined with grass, wool, plant down or, less often, feathers, latter brought throughout incubation; placed high up on vertical surface or below overhang, often over water, almost always in artificial site such as eaves of building, bridge, culvert, water tank or quarry, rarely in natural site (cliff); crevice sometimes used, then mud added and entrance tunnel made; also, nests from previous years repaired and reused. Clutch 1-4 eggs, normally 3, number decreasing during course of season; brood parasitism by conspecifics (16% of nests in one study) may account for some clutches of 4; incubation by both sexes, average bout length 9 minutes, period 14-16 days, mean 14·6 days; nestlings fed by both parents, rate of 2-9 feeds per nestling per hour, fledging period 24-25 days. Success rate from egg to fledgling 49% in one study, 57% in another; causes of nest loss include attacks by the red ants *Techmomyrmex albipes* and *Acantholepis capensis* (in one case leading to colony being abandoned), predation by monitor lizards (*Varanus*) and humans, egg removal and expulsion of adults by sparrows (*Passer*), and nest parasites such as louse-flies (*Ornithomya*), ticks (*Ornithodoros*) and mites (*Macronyssus*); nests also taken over by White-rumped (*Apus caffer*) and Little Swifts (*Apus affinis*).
Movements. Migratory. Highly gregarious after breeding. Present on breeding grounds in S Aug-Apr, a few remaining all year; migrates N to SE PRCongo and W DRCongo, where present Apr-Sept; probably passes through Botswana, Namibia, Angola and W Zambia on migration. Males return to breeding sites earlier than females. Vagrant in Malawi and C & SE Gabon.
Status and Conservation. Not globally threatened. Generally common in suitable habitat in main breeding range in South Africa; less common and more irregular in Namibia, Botswana, Zimbabwe and Lesotho. Has used artificial sites for nesting for over 100 years, and has benefited from increased availability of, especially, bridges and culverts; for example, construction of new towns and bridges allowed expansion into E Cape. Range has expanded N into Zimbabwe, where bred near Bulawayo for a few years and then in NE (Headlands District); also expansion W in Cape Province during and after wet summer of 1961-1962. Regularity of breeding in Karoo unclear, as observations sporadic. Suffers nest competition from House Sparrow (*Passer domesticus*) and Cape Sparrow (*P. melanurus*). Nests sometimes destroyed and nestlings taken for food by humans.
Bibliography. Benson *et al.* (1971), Borrow & Demey (2001), Bowen (1983b), Bridgeford & Bridgeford (1993), Broekhuysen (1974), Brooke (1991), Brooke & Ryan (1988), Burgerjon (1964), Christy & Clarke (1994), Clancey (1964b), Dowsett (1979, 1989), Dowsett & Dowsett-Lemaire (1991, 1993), Dowsett & Forbes-Watson (1993), Earlé (1984, 1985a, 1985b, 1985c, 1985d, 1985e, 1985f, 1986a, 1986b, 1986c, 1986d, 1987a, 1987g), Earlé & Brooke (1988), Earlé & Underhill (1991), Ginn *et al.* (1989), Godfrey (1943), Harrison, J.A. (1999), Harrison, J.A. *et al.* (1997), Herholdt (1986a, 1989), Hockey (1996), Irwin (1981), Keith *et al.* (1992), Lippens & Wille (1976), Mackworth-Praed & Grant (1963, 1973), Maclean (1993a), Medland (1985), Newman (1996), Newman *et al.* (1992), Pedersen (2000), Penry, E.H. (1986), Penry, H. (1994), Riede (2001), Rowan (1963), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair & Sinclair (1995), Sinclair *et al.* (1993), Skead (1979), Spottiswoode *et al.* (2001), de Swardt (1988), Tarboton (2001), Tree (1964), Tyler (2002a), Tyler & Borello (1998), Vernon (1962), Winterbottom (1962).

77. **Forest Swallow**

Petrochelidon fuliginosa

French: Hirondelle de forêt **German**: Bronzeschwalbe **Spanish**: Golondrina Selvática
Other common names: Forest Cliff Swallow, Dusky Swallow/Cliff Swallow

Taxonomy. *Lecythoplastes fuliginosus* Chapin, 1925, Lolodorf, southern Cameroon.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Affinities of present species unclear; has been considered distinct from others of genus on account of differences in plumage coloration, bill shape, nesting habits (solitary), nest shape and eggs (usually unspotted), but these may be adaptations to forest environment. Monotypic.
Distribution. SE Nigeria (Oban Hills), W Cameroon, Equatorial Guinea and Gabon.



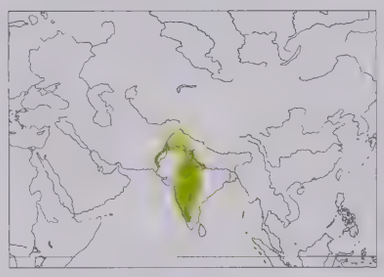
Descriptive notes. 11 cm. Plumage is almost entirely blackish-brown; crown black with blue gloss, chin and throat rusty brown; tail slightly forked. Distinguished from most *Psalidoprocne* species mainly by tail shape, from very similar *Psalidoprocne nitens* by rusty tinge on throat. Sexes alike. Juvenile apparently resembles adult. Voice. Not very vocal; soft song; also a "wheet" uttered in flight and a "pitchri".
Habitat. Lowland forest; forages in open areas, clearings, and around villages.
Food and Feeding. Details of diet not known. Feeds usually in pairs or small groups, sometimes with other swallows. Flight fast and fluttering, with frequent gliding.
Breeding. Poorly known. Eggs in Apr-Jun and young in Jan and Nov in Cameroon; immature in Jul in Gabon. Apparently solitary, but few records. Nest built by both sexes, completion in one case taking 2 weeks, enclosed, with long tubular entrance (one nest had two entrances), made of mud pellets, lined with vegetable fibres; attached to rock overhang, cave wall, or ceiling of building or verandah, probably sometimes also to tree. Clutch 2-3 eggs; no information on incubation and fledging periods.
Movements. Probably largely sedentary. Apparently an irregular migrant in Gabon; passage individuals recorded in Jan and Mar, and immature in Jul. Vagrant in NW PRCongo.
Status and Conservation. Not globally threatened. Restricted-range species: present in Cameroon and Gabon Lowlands EBA. Status unclear, as poorly known. Not uncommon in Cameroon; rare in Oban Hills Forest Reserve, in Nigeria.
Bibliography. Ash (1990), Bannerman (1951), Borrow & Demey (2001), Brosset & Érard (1986), Chapin (1925, 1948), Christy & Clarke (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Earlé (1987e), Elgood *et al.* (1994), Fishpool & Evans (2001), Hall & Moreau (1970), Keith *et al.* (1992), Louette (1981), Morel & Morel (1990), Serle (1954), Voisin (1958).

78. **Streak-throated Swallow**

Petrochelidon fluvicola

French: Hirondelle fluviatile **German**: Braunscheitelschwalbe **Spanish**: Golondrina India
Other common names: Indian Swallow/Cliff Swallow/Cliff Martin

Taxonomy. *Hirundo fluvicola* Blyth, 1855, Somar and Kane Rivers, Bundelkund, northern Madhya Pradesh, India.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. May form a superspecies with *P. ariel*, and sometimes considered conspecific. Monotypic.
Distribution. NE Afghanistan, C & E Pakistan (mainly R Indus plain) and NW & C India (E to E Uttar Pradesh, S to S Karnataka).



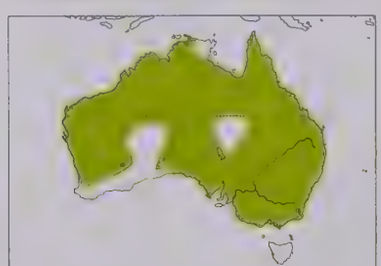
Descriptive notes. 11-12 cm; 8-12 g. Has forehead, crown and nape dull chestnut with faint dark streaks, back glossy deep blue with few narrow whitish streaks, rump pale brown; wings and tail blackish-brown, tail almost square-ended; underparts buffy white, blackish-brown streaks on, especially, chin, throat, neck side and breast; underwing-coverts grey-brown. Distinguished from very similar *P. ariel* by brighter crown, streaked neck side. Sexes alike. Juvenile is duller and browner than adult, with buff feather edges, faint streaks on underparts. Voice. Song is a twittering; also a sharp "trr trr".
Habitat. Open country, foothills, cultivation, and human habitations, including towns; often near water, including canals, rivers, lakes. To c. 1000 m, mostly below 700 m; occasionally higher on passage.
Food and Feeding. Diet includes flies (Diptera). Forages in flocks; joins other hirundines. Flight weak, fluttery.
Breeding. Varies locally; mainly Mar-Jun in N and Dec-Apr and Jul-Oct in S; peaks Mar-Apr and also Jul-Oct in Pakistan; may have two broods. Colonial, a few tens to a few hundred pairs, nests abutting each other, often in tiers. Nest built by both sexes, enclosed, with tubular entrance, made of mud pellets, lined with dry grass, horsehair and feathers, attached to cliff, bridge, culvert, irrigation barrage, or building (deserted or inhabited); sites over water preferred. Clutch 3-4 eggs, occasionally 2; both sexes incubate and both feed nestlings, incubation and fledging periods not documented.
Movements. Mainly resident; some post-breeding movements, especially to lower altitudes, e.g. winter visitor Oct-Mar to Goa (SW India). Mainly a breeding visitor in Afghanistan, N Pakistan and NW India, although some reported to be resident in N Pakistan. Scarce visitor to Nepal, and several records outside main Indian range (e.g. E to Bihar and Orissa, W to Gujarat). Vagrant in Bangladesh and Sri Lanka.
Status and Conservation. Not globally threatened. Common in Pakistan, locally common in India. Has probably benefited from increased availability of artificial nest-sites associated with human habitations; for example, apparent increase in numbers in Punjab with expansion of irrigation systems and canal bridges. In Pakistan, appears also to have spread S into N Sind during last century.
Bibliography. Ali (1996), Ali & Ripley (1987), Daniels (1997), Grimmett *et al.* (1998), Harrison, J. (1999), Henry (1998), Hüe & Étchécopar (1970), Inskipp, C. & Inskipp (1991), Inskipp, T. *et al.* (1996), King (1997), Lamsfuss (1998), Mahabal & Lamba (1987), Majumdar *et al.* (1992), Mukherjee (1995), Phillips (1978), Ripley (1982), Roberts (1992), Stuart Baker (1934), Vaurie (1951b, 1959), Wijesinghe (1994).

79. **Fairy Martin**

Petrochelidon ariel

French: Hirondelle ariel **German**: Arielschwalbe **Spanish**: Golondrina Ariel

Taxonomy. *Collocalia Ariel* Gould, 1843, New South Wales, Australia.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. May form a superspecies with *P. fluvicola*, and sometimes considered conspecific. Birds from NW Australia described as race *conigravi*, but indistinguishable from those in rest of range. Monotypic.
Distribution. Australia (excluding Melville I, Groote Eylandt, much of SW, and Tasmania).



Descriptive notes. 11 cm; 9-14 g. Has forehead, crown and nape rufous-brown, face grey-brown, back glossy deep blue with few whitish streaks, rump dull white or buffish-white; wings and tail brownish-black, tail slightly forked; underparts dull white, fine streaks on throat and upper breast, grey-white undertail-coverts; underwing-coverts white, tinged brown. Distinguished from very similar *P. fluvicola* by somewhat duller crown, plainer unstreaked face, from *P. nigricans* by rufous (not blue) crown and nape. Sexes alike. Juvenile is duller, browner, with buffy feather edges. Voice. Song is a high-pitched twittering; contact call "chrrr" or "prrrt-prrrt".
Habitat. Open areas, such as open woodland and grassland, usually near water.

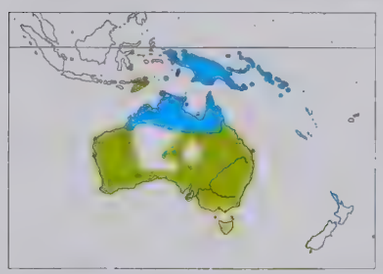
Food and Feeding. Diet includes mayflies (Ephemeroptera), termites (Isoptera), bugs (Hemiptera), beetles (Coleoptera), flies (Diptera), hymenopterans (including parasitic wasps and ants) and moths (Lepidoptera). Forages in flocks; flight slow, usually high up. Also recorded as feeding on moths on a lawn.
Breeding. Aug-Feb; two broods, sometimes three. Socially monogamous, but some extra-pair paternity (in one study, 29% of 70 broods and 14% of nestlings). Colonies, usually of a few tens of pairs (8-30 in one study), sometimes to several hundred pairs, nests built close together; breeding asynchronous within and between colonies. Nest-construction by both sexes, average times in two studies 15 and 30 days, nest enclosed, with tube entrance, made of mud pellets, lined with grass and feathers; attached mainly to artificial site such as culvert, bridge, mine shaft, pipe, wharf, verandah or under house eaves, less often cliff, cave, riverbank or tree, and usually over water. Clutch 2-5 eggs, average in studies in Victoria and New South Wales 3·5; incubation by both sexes, 45% by male, period in Victoria 12-18 days (mean 13·7), in New South Wales 11-17 days (mean 13·8); both also feed nestlings, fledging period in Victoria 17-32 days (mean 22·1), in New South Wales 14-30 days (mean 22·5), duration increasing with larger brood size. Success in Victoria 1·8 fledglings per complete clutch, pairs produced 0-8 fledglings per season, in New South Wales brood size 3·3 early in season and 3 late in season; failure rate high during prolonged cold, wet weather through parents deserting nest, adult mortality also occurs in such conditions; other causes of failure include nest falling down, flooding, nest predation by kingfishers (Alcedinidae), and competition with House Sparrow (*Passer domesticus*), Zebra Finch (*Taeniopygia guttata*) and pardalotes (*Pardalotus*).
Movements. Some post-breeding movements. Partial migrant in SE Australia; large movement to N parts of Australia after breeding. Adults, especially males, generally return to same breeding site in successive years. Recorded N to islands in Torres Strait, Lesser Sundas and New Guinea, in S in Tasmania, and in New Zealand.
Status and Conservation. Not globally threatened. Widespread and common, especially in E. May have benefited from increased availability of artificial nest-sites and increase in amount of grassland habitat over the last century. Was fairly regular breeder in Tasmania in 19th century, and unoccupied nest found there in 1968. Several sightings in New Zealand in past few decades, with a few possible records of breeding (e.g. nests found in 1977/78 and a family group in 1983).
Bibliography. Baldwin (1965), Beehler *et al.* (1986), Bell (1968, 1984), Blakers *et al.* (1984), Coates (1990), Coates & Bishop (1997), Finch (1982), Gregory (1994, 1995), Hamilton (1981), Heather & Robertson (1997), Inskipp *et al.* (1996), King (1997), Lane (1965), Lord (1956), Macdonald (1988), Magrath (1998, 1999), Magrath & Elgar (1997), Magrath *et al.* (2002), Morcombe (2000), Murray *et al.* (1987), Nevill (1984a), Pizzey & Knight (1997), Reilly & Garnett (1973), Riddell & Taylor (1984), Robertson & Heather (2001), Schodde & Mason (1999), Sedgwick (1958), Semmens (1993), Serventy & Whittell (1962), Simpson & Day (1998), Slater *et al.* (1989), Tarburton (1991), Trounson & Trounson (1987), Vincent (1972), White & Bruce (1986).

80. Tree Martin

Petrochelidon nigricans

French: Hirondelle des arbres **German**: Baumschwalbe **Spanish**: Golondrina Arborícola
Other common names: Australian Tree Martin

Taxonomy. *Hirundo nigricans* Vieillot, 1817, Hobart, Tasmania.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Affinities of species not clear, as it differs from typical members of genus in e.g. nest structure and material. Until recently, W mainland population was placed in nominate race, but all those in Australia now thought to belong to race *neglecta*, differentiated from Tasmanian population. Three subspecies recognized.
Subspecies and Distribution.
P. n. timoriensis Sharpe, 1885 - E Lesser Sundas (Timor, probably also Flores).
P. n. neglecta Mathews, 1912 - Australia (except N and dry C areas).
P. n. nigricans (Vieillot, 1817) - Tasmania; migrates N as far as New Guinea.



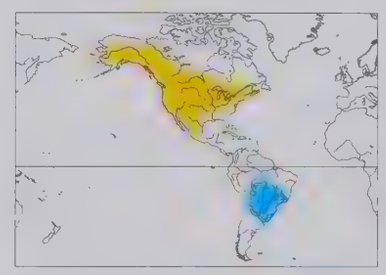
Descriptive notes. 13 cm; 14-19 g. Nominate race has rufous forehead band, glossy deep blue crown, nape and back, dull white rump with brownish-black shaft streaks, dusky uppertail-coverts with pale feather margins; wings and tail blackish-brown, tail slightly forked; cheeks and throat dull white with faint dark streaks; underparts dull white, greyer on breast, tinged pale rufous, especially on flanks, undertail-coverts tinged chestnut-brown. Differs from *P. ariel* in blue crown and nape. Sexes alike. Juvenile is duller, browner, with rufous areas paler, pale feather edges. Race *neglecta* resembles nominate but smaller, with less rufous tinge; *timoriensis* differs from previous in having stronger dark streaks on throat. Voice. Song is a high-pitched twittering; contact call "tsweet".
Habitat. Open woodland near water, also human habitations, including towns and cities. Forages over and around trees, and over waterbodies and farmland, especially pasture; has been recorded as feeding over the sea. Roosts in reedbeds and eucalyptus (*Eucalyptus*) trees.
Food and Feeding. Diet includes hymenopterans (including parasitic wasps and ants), hoverflies (Syrphidae) and other dipterans, beetles (Coleoptera), bugs (Hemiptera), Odonata, spiders (Araneae). Forages alone or in small groups, usually higher than 6 m above ground; flight rapid.
Breeding. Generally Jul/Aug-Jan, but mainly Aug-Nov in SW, and opportunistically after rain in arid areas; may often be double-brooded. Solitary or in small groups, usually 2-10 pairs, once 50 pairs in a cave. Nest surprisingly flimsy, a lining of dry grass, leaves (e.g. those of eucalyptus), pine (*Pinus*) needles, sometimes also feathers, placed in hole in tree, cliff, cave, bridge, pier, wall or roof of building, including verandah and ventilator, or in nestbox; artificial sites reported as used more frequently in W; when using crevice, reduces size of entrance by applying mud mixed with plant fibres; will also take over nest of *Hirundo neoxena*, sometimes driving away owners, and build up walls with mud to form small entrance; also reported as entering nests of *P. ariel*; nests reused in successive years. Clutch 3-5 eggs, generally 4; no information on incubation and fledging periods.
Movements. Migratory in SE; mostly resident or partial migrant elsewhere. Forms post-breeding flocks and roosts of hundreds or thousands of individuals. Those breeding in SE Australia and Tasmania migrate to N parts of Australia, islands in Torres Strait and New Guinea, less often to Lesser Sundas, Moluccas and Solomon Is; some reported on breeding grounds in austral winter and a few on non-breeding grounds in summer. Present all year in SW Australia, but passage movements evident in spring and autumn, and fewer reported in winter than in summer. In NE Australia, near Innisfail (Queensland), also present all year below 1000 m, but absent between Dec and Sept on the tableland; population in Atherton region increases in winter months. Vagrants and small flocks of up to 30-35 birds recorded in New Zealand, especially in N South I (Nelson Province and near Farewell Spit).
Status and Conservation. Not globally threatened. Widespread and common breeder in S Australia (few breeding records N of 20° S); locally common on Timor. Density of 0·5 birds/ha recorded in eucalypt forest at Boola Boola. Uses mainly natural nest-sites; habit of exploiting artificial sites is relatively new and may increase, potentially allowing population to expand. Reported to have bred in 1893 in New Zealand (at Oamaru, in SE South I), but this record possibly referable to *Hirundo neoxena*.
Bibliography. Andrew (1992), Barton (1947), Beehler *et al.* (1986), Bell (1979), Blakers *et al.* (1984), Brothers *et al.* (2001), Bull *et al.* (1985), Campbell (1901), Coates (1990), Coates & Bishop (1997), Diamond (1972), Doughty *et al.* (1999), Draffan *et al.* (1983), Falla *et al.* (1981), Filardi *et al.* (1999), Green (1966), Gregory (1995), Griffiths & Holyoak (1993), Hadden (1981), Hastwell (1985a), Heather & Robertson (1997), Henley (1974), Inskipp *et al.* (1996), King (1997), Lord (1956), Macdonald (1988), Mayr (1944), Mayr & Rand (1937), Mellor (1967), Mollison & Green (1962), Morcombe (2000), Morrison & Morrison (1985), Oliver (1955), Pescott (1978), Pizzey & Knight (1997), Rand & Gilliard (1967), Ripley (1964), Robertson, C.J.R. (1985), Robertson, H. & Heather (2001), Saunders & Ingram (1995), Schodde & Mason (1999), Sedgwick (1949), Semmens (1993), Serventy & Whittell (1962), Sharland (1943), Slater *et al.* (1989), Watts (1999), White & Bruce (1986), Wright & Bell (1960).

81. Cliff Swallow

Petrochelidon pyrrhonota

French: Hirondelle à front blanc **German**: Fahlstirnschwalbe **Spanish**: Golondrina Risquera
Other common names: American/North American Cliff Swallow

Taxonomy. *Hirundo pyrrhonota* Vieillot, 1817, Paraguay.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Variation clinal, birds becoming smaller and darker from N to S, and races intergrade. Status of race *ganieri* not clear, possibly better merged with nominate. Proposed races *hypopolia* (from Alaska and W Canada S, inland, to EC California, N Utah and NW Wyoming) and *aprophata* (S Oregon) considered to fall within range of variation of nominate; *minima*, described from SW USA (Arizona), considered synonymous with *melanogaster*. Has hybridized with *Hirundo rustica*, and one record with *Tachycineta bicolor*. Four subspecies currently recognized.
Subspecies and Distribution.
P. p. pyrrhonota (Vieillot, 1817) - breeds North America from W & C Alaska and Canada (N Yukon and N Mackenzie E to N Manitoba, N Ontario, S Quebec, Prince Edward I, New Brunswick and Nova Scotia) S to NW Mexico (NW Baja California) in W and, in E, to E USA (S to W Virginia, SE Pennsylvania, W Connecticut and NE Massachusetts, with scattered local populations farther S & E); winters South America.
P. p. tachina Oberholser, 1903 - breeds S USA (SW Utah S to C Arizona, C New Mexico and SW Texas) S to NW Mexico (Baja California); presumed to winter South America.
P. p. melanogaster (Swainson, 1827) - breeds SE Arizona and SW New Mexico S to S Mexico (S to Nayarit and Oaxaca); winters South America.
P. p.ganieri (A. R. Phillips, 1986) - breeds S USA W of Appalachians (WC Tennessee S to S Texas); presumed to winter South America.



Descriptive notes. 13-15 cm; 17-27 g. Nominate race has white to buffy forehead, black lores, glossy deep blue crown, pale grey-brown hindneck; mantle and back glossy deep blue, mantle with whitish streaks, rump light cinnamon-rufous; wings and tail blackish-brown, tail square-ended; head side and throat chestnut, patch of black on throat and uppermost breast; upper breast and sides grey-brown, pale chestnut tinge (variable) on breast, rest of underparts whitish, longer undertail-coverts with dusky grey-brown centres; underwing-coverts grey-brown. Distinguished from most other hirundines by combination of rufous rump and square tail; differs from *P. fulva* in having chestnut throat with black patch, smaller and paler forehead patch. Sexes alike. Juvenile is duller and browner, ear-coverts dark brown, throat and forehead variable in colour and pattern, pale feather margins on upperparts. Races differ in size and coloration, smaller and darker in S: *tachina* is smaller than nominate, forehead cinnamon to light buff; *melanogaster* is same size as last but darker, forehead dark rufous-chestnut, rump darker cinnamon; *ganieri* has darker chestnut undertail-coverts, rest of underparts with only slight chestnut tinge. Voice. Song is a rapid squeaky twittering; other calls include a "chur" call used in many contexts, a plaintive alarm call "purr" and a squeak call used to signal a source of food.
Habitat. Open and semi-open areas, especially near water, including grassland, cultivation, forest clearings and rivers, also human habitations, including towns; prefers open areas for feeding throughout year. Roosts in wetland vegetation. To 2770 m, rarely to 3200 m; recorded to 4000 m on passage. Originally restricted more to W mountainous areas that provided cliffs for nesting.
Food and Feeding. In samples taken throughout North America, diet consisted of 29% Hymenoptera (including ants, bees and wasps), 27% beetles (Coleoptera), 27% bugs (Hemiptera), 14% flies (Diptera), and a few Lepidoptera (mainly moths), grasshoppers and crickets (Orthoptera), dragonflies and damselflies (Odonata), mayflies (Ephemeroptera), lacewings (Neuroptera) and spiders (Araneae); nestling diet in California 39% hymenopterans, 27% hemipterans, 19% beetles, 12% dipterans. In C USA (Nebraska) study, insects from 84 families recorded in nestling diet, with preference for those that swarm, but mainly dipterans (especially of families Dolichopodidae, Simuliidae, Empididae, Chironomidae, Muscidae, Culicidae), hymenopterans (mainly ants and sawflies) and homopteran bugs (mainly aphids and cicadellids). Feeds in flocks of up to 1000 or more birds, in warm weather 50 m or more above ground, lower in cool weather, but often changes height when feeding; frequently makes short glides. Recorded also as feeding on ants on ground. Usually forages within 1·5 km of nest-site, sometimes up to 6 km. Gathers at insect aggregations, uses special call that attracts others to site in bad weather; unsuccessful foragers at colony also follow successful ones to a feeding site; group foraging shown to increase feeding efficiency.
Breeding. Mainly late Apr/May-Jul/early Aug; in USA, first eggs from early Apr in SW (Texas, California) to late May in C & NE (Illinois, Pennsylvania, Massachusetts), and in Jun in Arizona (where breeding coincides with summer rains); single-brooded, two broods recorded rarely in Nebraskan study. Socially monogamous, but extra-pair copulations common. Most colonial hirundine, often in groups of 200-400 pairs, sometimes up to 1000, and colony of 3700 pairs recorded in Nebraska; colony size varies within and among areas, and some pairs solitary. Male

claims and defends breeding site on arrival, little courtship, potential mate gradually accepted at nest-site; copulation inside nest, extra-pair copulations often at mud-gathering sites; male does not guard mate away from nest. Nest-building takes 3-27 days, period shortest when nest wall shared with neighbours; nest retort-shaped, with downward-pointing entrance tunnel, made of mud pellets, lined with dry grass stems; *Hirundo rustica* nest occasionally used as base, and will also evict owners of active nest, e.g. one pair took over that of a Say's Phoebe (*Sayornis saya*) and threw out nestlings; nest sited 1·5-10 m or more above ground or water, attached to cliff, cave entrance, under tree branch (infrequently), bridge (concrete bridges preferred to wooden ones), dam, culvert, or building; often on cliffs and bridges or in culverts in C or SE areas, buildings used more in California and NW & NE USA, and in Nebraskan study colonies on artificial sites larger than those on cliffs; *Riparia riparia* burrows, rock crevices and holes in artificial substrates also used, with mud wall and tunnel added; old nests reused unless containing parasites, and some sites used only in alternate years (occasionally after absence of 2-5 years). Clutch 1-6 eggs, average in various studies 3·3-3·7, declining through laying season; conspecific brood parasitism occurs, at least 22% of nests held parasite eggs in one study and 3·7% in another (parasite has own nest, but also lays in, or transfers egg in bill to, neighbouring nest), and single eggs sometimes destroyed by neighbours (perhaps as prelude to parasitism); male and female share parental duties about equally; incubation intermittent after first 2-3 eggs, continuous from penultimate, period 10-19 days; nestlings brooded continuously for 2-3 days, decreasing to zero at c. 11-12 days, fed with small insects up to days 6-7, then eat adult diet; feeding rates variable, means of 3·4-18·4 per hour in one study, highest in colonies of c. 100 nests, but amount of food per bolus greater in large colonies; nestling period 20-26 days; fledglings fed for further 3-5 days, sometimes longer, young from various colonies form crèche of up to 1000 individuals in trees, on wires or on cliffs, up to 2-3 km from nest, parents locate offspring in crèche by calls, perhaps also by facial markings; juveniles enter other nests and steal food. Mean number of young fledged per nest in various studies 1·56-2·24, and most breeding recruits from clutches of 4 or 5 (varying annually); hatching rate increases with colony size, and fledging success and survival to first year highest for intermediate-sized colonies; main causes of nestling mortality are parasitism by swallow bugs (*Oeciacus vicarius*) leading to decline in fledging success through season, also nest destruction and food shortage as a result of adverse weather, and depredation by House Sparrows (*Passer domesticus*). Recorded longevity 12 years.

Movements. Long-distance migrant, winters in South America. Forms large post-breeding flocks of hundreds, sometimes thousands, of individuals. Leaves breeding grounds Jul-Sept, peak departure in Aug and early Sept; migrates through SE USA, Mexico and Central America into South America, also common passage migrant Aug-Oct in W Venezuela; mixes with other hirundines on migration. Arrives in winter quarters Oct-Dec. Winter range poorly known, apparently extends (mainly E of Andes) from SE Paraguay and SE Brazil S mainly to C Argentina, also rarely Ecuador and Peru, and less numerous and less regular S to Tierra del Fuego; non-breeding ranges of different races uncertain, but nominate recorded in NE Argentina and *melanogaster* in NW Argentina; possibly nomadic in winter. In addition, small numbers recorded farther N, in Panama and California, in winter months. Return N Feb-Apr; arrival in S of breeding range Feb to early Mar, later in N, e.g. mid-Apr in Massachusetts and mid-May in Alaska; *melanogaster* in Arizona returns 6-8 weeks later than other races. More philopatric than other hirundines, and genetically predisposed to return to colony of similar size to natal one: in three studies, 48-74% of birds ringed in year of hatching and recaptured in following year returned to natal site (others mostly to site up to 3·5 km away), and 45-82% of adults returned to same site. Vagrants recorded widely, e.g. in N to NE Asia (Siberia, Wrangel I), Aleutian Is, St Lawrence I, N Alaska, Newfoundland and Greenland, in E Pacific Ocean (Clipperton I, W of Central America), in Caribbean (St Kitts, Barbados), in Falkland Is, and in Europe (British Is, France).

Status and Conservation. Not globally threatened. Total population estimated at c. 89,000,000 birds. Common in much of range; common to fairly common in Mexico. In USA, breeding range has expanded E of Great Plains and in SE in last 50 years as newly constructed buildings, culverts and bridges have provided additional nest-sites; breeding local but increasing, especially in Gulf States, North and South Carolina and Tennessee; first bred in Georgia in 1965, Florida in 1975 and Louisiana in 1980. Also expanded in NE USA from early 1800s as human settlement increased (e.g. first bred New York State in 1817), but disruption of nesting activities in this region by introduced House Sparrows led to a decline and continuing low numbers. House Sparrows also destroyed nearly half of the nests in one year in W Virginia and all 100 nests in a colony in Nebraska. Measures taken to control this species can increase the swallow's numbers locally, e.g. by 87% annually at one site when sparrows were removed. Removal of old nests during winter not only eliminates build-up of parasites, but also reduces number of potential roosting sites for House Sparrows. Will sometimes use artificial plaster nests.

Bibliography. Arendt (1992), Baicich & Harrison (1997), Barlow *et al.* (1963), Beal (1907), Beecher, Medvin *et al.* (1986), Beecher, Stoddard & Loesche (1985), Behle (1963, 1976), Bent (1942), Binford (1989), Brown, C.R. (1984c, 1985, 1986, 1988a, 1988b), Brown, C.R. & Brown (1986, 1987, 1988a, 1988b, 1988c, 1989, 1991, 1992a, 1995, 1996, 1998a, 1998b, 1999c, 1999d, 2000a, 2000b, 2000c, 2001, 2002), Brown, C.R. & Hoogland (1986), Brown, C.R. & Sherman (1989), Brown, C.R., Brown & Danchin (2000), Brown, C.R., Brown & Rannala (1995), Brown, C.R., Brown & Shaffer (1991), Brown, C.R., Komar *et al.* (2001), Brown, C.R., Sas & Brown (2002), Browning (1992), Butler (1982a, 1982b), Campbell, Dawe *et al.* (1997), Chapman & George (1991), Contreras, A.J. (1997), Contreras, J.R. (1995a), Cyr & Larivée (1995), DeGraaf & Rappole (1995), DeGraaf & Rudis (1986), Dickerman & Parkes (1997), Ednie (1994), Ehrlich *et al.* (1992), Emlen (1952, 1954, 1986), Faaborg & Terborgh (1980), ffrench (1991), Frémont (2002), Gauthier & Thomas (1993a, 1993b), Godfrey (1986), Grant & Quay (1977), Hamilton & Martin (1985), Hellmayr (1935), Hespenheide (1980), Hilty & Brown (1986), Hobson & Sealy (1987), Hough (2000), Howell & Webb (1995a), Johnsgard (1979), Kaufman (1996), Kilgore & Knudsen (1977), Krapu (1986), Little (1990), Loesche *et al.* (1991), Loye & Carroll (1991), Martin, R.F. (1980), Mayhew (1958, 1963), Medvin *et al.* (1992, 1993), Meek & Barclay (1996), Myres (1957), Paynter (1995), Peck & James (1987), Peterjohn *et al.* (1995), Price *et al.* (1995), Ramstack *et al.* (1998), Rappole *et al.* (1995), Ridgely & Tudor (1989), Robidoux & Cyr (1989), Rowley (1984), Samuel (1969a, 1969b, 1969c, 1971a, 1971b), Sauer & Droege (1992), Sikes & Arnold (1984), Small (1994), Smyth *et al.* (1993), Stoddard (1988), Stoddard & Beecher (1983), Stoner (1945), Stotz *et al.* (1996), Wilkinson & English-Loeb (1982), Withers (1977).

82. Cave Swallow

Petrochelidon fulva

French: Hirondelle à front brun **German**: Höhlenschwalbe **Spanish**: Golondrina Pueblera
Other common names: Cinnamon-throated Swallow (S Mexican and Caribbean races)

Taxonomy. *Hirundo fulva* Vieillot, 1808, Santo Domingo, Dominican Republic.

Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Forms a superspecies with *P. rufocollaris* and often considered conspecific, but recent cytochrome *b* evidence supports treatment as separate species. Race *pallida* recently proposed to represent a distinct species; cytochrome *b* data further suggest, however, that present species consists of two clades, one in W (S USA S to S Mexico) and other in E (Florida and Greater Antilles); additional study required. Several hybrids with *Hirundo rustica* recorded. If genus merged into *Hirundo*, race *pallida* must be named *pelodoma*, as "*Hirundo pallida*" preoccupied. Six subspecies currently recognized.

Subspecies and Distribution.

P. f. pallida Nelson, 1902 - breeds S USA (S New Mexico and Texas) S to NC Mexico (S to S Chihuahua, E Durango, Zacatecas, San Luis Potosí and W Tamaulipas); some migrate to Central America.

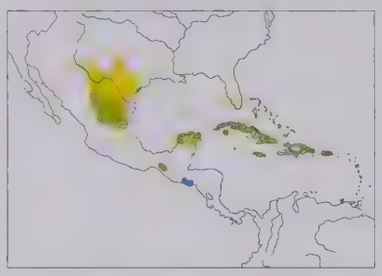
P. f. citata Van Tyne, 1938 - S Mexico (C Chiapas, N Yucatán Peninsula).

P. f. cavicola Barbour & A. C. Brooks, 1917 - SE USA (Florida) and Cuba (including I of Pines).

P. f. poeciloma (Gosse, 1847) - Jamaica.

P. f. fulva (Vieillot, 1808) - Hispaniola.

P. f. puertoricensis Garrido *et al.*, 1999 - Puerto Rico.



Descriptive notes. 12 cm; 14-18 g. Nominate race has chestnut forehead to area above eye, blackish lores, glossy blue-black crown, grey-brown hindneck; mantle and back glossy blue-black, mantle streaked whitish, rump light chestnut; wings and tail blackish-brown, tail almost square-ended; head side and throat buffy cinnamon to pale cinnamon-rufous, upper breast and sides similar but with grey-brown tinge, lower breast and abdomen whitish, longer undertail-coverts lightish brown centrally; underwing-coverts pale brownish. Distinguished from *P. pyrrhonota* by darker forehead, paler throat. Sexes alike. Juvenile is duller and browner, variable amount of white on forehead, cinnamon margins on wings and uppertail-coverts. Race *cavicola* closely resembles nominate, but deeper blue crown, wider white streaks on back; *poeciloma* has paler forehead, less white on abdomen, cinnamon more extensive, rustier undertail-coverts; *puertoricensis* has cinnamon or chestnut coloration more intense, also distinctive dark rusty wash on undertail-coverts; *pallida* is larger than others, with light cinnamon throat, collar, forehead and rump; *citata* is small, with paler forehead and rump and more brown on breast and throat than nominate. Voice. Song consists of initial squeaks, a warble and a terminal series of two-tone notes; other calls are a "che", a short "weet" or "cheweet", a series of "che" or "chu" notes and a low-pitched "choo", uttered as alarm calls in predator or territorial contexts.

Habitat. Open areas, often near water, especially ravines and cliffs where caves are present for nesting; also along roads with bridges and culverts, cultivation, and around human habitations, including towns. To 1500 m.

Food and Feeding. Diet includes bugs (both Heteroptera and Homoptera), flies (Diptera), beetles (Coleoptera), wasps, bees and ants (Hymenoptera), butterflies and moths (Lepidoptera), lacewings (Neuroptera), Orthoptera. Stomachs of 36 specimens from Puerto Rico contained at least 22 species, mainly orthopterans; coleopterans found in more than 50% of stomachs, dipterans in 16%, ants in 10%. Most foraging early in day and in late afternoon. Forages at various heights, up to 100 m, in loose flocks, often large ones; mixes with other hirundines and swifts (Apodidae). Flight strong, with frequent periods of gliding. Sometimes feeds along cliff face. Recorded as flushing moths by flying into foliage of tree, then circling back to catch them.

Breeding. Late Feb to early Sept in Texas (probably including early nest-building) and late Apr to early Aug (peak May to mid-Jul) in New Mexico; early Apr to late Jul in Florida; Feb-Oct in Mexico; in West Indies mainly Apr-Aug, from Mar in Cuba, but season in Jamaica unclear (reported as most months except Dec-Feb, and conversely as Oct-May); sometimes two broods in Texas, probably also in Florida. Monogamous, but extra-pair copulations occur. Colonial, in groups of a few tens of pairs, occasionally a few hundreds, and 1500 pairs recorded in one cave; nests sometimes scattered, sometimes clustered, but rarely abutting one another. Nest built by both sexes, either an open flattened half-saucer or half bowl, or enclosed with sides built up to meet an overhang above it, with entrance near apex or (rarely) on side, made of mud pellets, or mud and guano when in cave where bats roost, cup lined with e.g. seed-down, sheep's wool, bark, dry grass and dry algae, feathers added finally, sited usually at least 1 m above ground in cavity or along crack in twilight zone of cave or sinkhole, in cliff, or on bridge, culvert, silo, ruined fort, cathedral or other building (including Mayan ruins on Yucatán Peninsula); nest type varies within and between populations, in NW (race *pallida*) usually open or partially enclosed when in natural site but more often enclosed when in artificial one, elsewhere enclosed nests more common, but in S Mexico (*citata*) open nests also reported; in Cuba often a half-saucer on horizontal surface or in crevice, in Hispaniola often half-cup on wall or, less often, enclosed with side tunnel, in Jamaica often half-cup on vertical or sloping surface, and in Puerto Rico a half-saucer or, less often, enclosed; in Florida, sometimes starts breeding in open nest but adds mud to enclose it during incubation/brood-feeding; one pair used old *P. pyrrhonota* nest; in Texas, species recently found to take over old nests of *Hirundo rustica*, these accounting for 69% of all nests detected for present species during 2001 survey; nests reused within same and successive seasons, last for several years. Clutch usually 3-5 eggs, occasionally 1-2 (perhaps not complete), clutch size decreases during season; incubation probably by both sexes, c. 15-16 days; chicks fed by both sexes, nestling period normally 20-22 days but up to 26 days; fledglings gather in crèches during day, return to nest to roost for a few days. In study in USA (Texas), 78% of eggs hatched, 65% produced fledglings in first brood, 37% in second; second broods more successful in culverts than in caves.

Movements. Migratory in N, resident or partial migrant in S. Often in small groups when not breeding, but flocks of several hundred before migrating. Race *pallida* absent from New Mexico and N Texas in winter months; known to occur in non-breeding season in Central America (El Salvador), but since mid-1980s increasing numbers have overwintered in S Texas and N Mexico. Population in Florida absent in winter, may migrate to West Indies. Mexican and Caribbean populations largely resident, but *cavicola* present in Cuba only locally in late Oct to Jan. Vagrants often recorded farther N in Florida, on E Gulf coast and on Atlantic coast (N as far as Nova Scotia), perhaps reflecting general range expansion; other records include S USA (W & N to California, Arizona, Nebraska), Baja California, Bermuda, Cayman Is, Virgin Is; sight record also from S Canada (Ontario).

Status and Conservation. Not globally threatened. Overall population estimated at c. 8,700,000 birds. Common throughout range. As this species' natural nest-sites are generally widely dispersed, breeding populations often widely scattered; can, however, be locally abundant, e.g. in SW Texas and adjacent S New Mexico c. 5000 individuals at 20 sites in Guadalupe Mts and 2500-3000 at Carlsbad Caverns. Dramatic extension of breeding range to N occurred during past century; first nested in Texas in 1914, New Mexico in 1930 and Florida in 1987; continued N expansion especially marked in Texas and Florida since 1980s; has bred in Arizona (1993). Expansion linked to increased use of road bridges, culverts and other artificial nest-sites, and species has thus benefited from human activity; irrigation and cultivation of arid areas in USA may also have increased the amount of suitable foraging sites; recent survey suggests presence of colonies of *Hirundo rustica* may have facilitated range extension, as present species regularly takes over old nests of latter species.

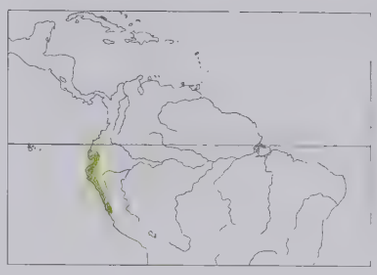
Bibliography. Álvarez del Toro (1980), Amadon & Eckelberry (1955), Amos (1991), Anon. (1998a), Arendt (1992), Baicich & Harrison (1997), Baker (1962), Balat & González (1982), Bannon (1999), Barbour (1943), Beatty & Danforth (1931), Bent (1942), Biaggi (1983), Bond (1943, 1985), Bradley (2000), Brown & Brown (1992b), Buden (1987a), Casto (1998), Contreras (1997), Danforth (1929, 1935b), DeGraaf & Rappole (1995), Dobson (2002), Faaborg (1985), Friedmann *et al.* (1950), Garrido & Kirkconnell (2000), Garrido *et al.* (1999), Gosselin (2000), Hellmayr (1935), Holt (1993), Hough (2000), Howell & Webb (1995a), Huels (1984, 1985), Kaufman (1996), Keith (1997), Keith *et al.* (2003), Kirchman (1998), Kirchman *et al.* (2000), Kirkconnell *et al.* (1993), Klaas (1968), Komar (1997), Komar & Domínguez (2001), Kosciuch & Arnold (2003), Llanes & Abreu (1994), Mancina & Llanes (1997), Martin (1974, 1980, 1981, 1982, 1983), Martin & Héctor (1988), Martin & Martin (1978), Martin & Selander (1975), Martin, Martin & Lanier-Martin (1986), Martin, Miller *et al.* (1977), McNair & Post (1999), Mlodinow & O'Brien (1996), Oberholser (1974), Palmer (1988), Peris & Llanes (1998), Phillips (1986), Price *et al.* (1995), Raffaele *et al.* (1998), Rappole *et al.* (1995), Ridgely & Gwynne (1989), Ridgway (1904), Riede (2001), Selander & Baker (1957), Slud (1964), Smith *et al.* (1988), Stokes & Stokes (1996a, 1996b), Stotz *et al.* (1996), Terres (1982), Urban (1959), Van Tyne (1938), Wauer & Davis (1972), Webber (1996), West (1988, 1991, 1995), Wetmore (1916), Wetmore & Swales (1931), Wormington (1999).

83. Chestnut-collared Swallow

Petrochelidon rufocollaris

French: Hirondelle à bande rousse **Spanish**: Golondrina Cuellirrufa
German: Rotnackenschwalbe
Other common names: Peruvian Swallow; Ecuadorian Swallow (*aequatorialis*)

Taxonomy. *Hirundo rufocollaris* Peale, 1848, near Callao, Lima, Peru.
Genus often merged with *Hirundo*, but DNA studies support retention of separate taxa. Forms a superspecies with *P. fulva*; often regarded as conspecific, but cytochrome *b* evidence supports treatment as separate species. Race *aequatorialis* sometimes referred to by new name *chapmani*, which was proposed in mistaken belief that former name preoccupied. Two subspecies recognized.
Subspecies and Distribution.
P. r. aequatorialis Chapman, 1924 - SW Ecuador (Manabí S to El Oro and W Loja).
P. r. rufocollaris (Peale, 1848) - W Peru (S to Lima).



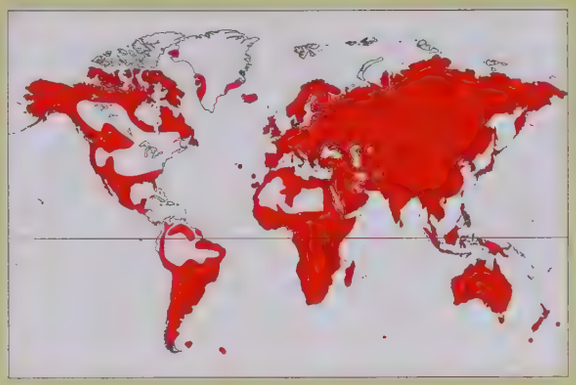
Descriptive notes. 12 cm; 14-18 g. Nominate race has dark chestnut forehead and hindneck, glossy deep blue crown and back, mantle streaked whitish, and chestnut rump; wings and tail blackish-brown, tail almost square-ended; head side and throat whitish, upper breast and sides chestnut-rufous, lower breast and abdomen whitish, undertail-coverts brown. Sexes alike. Juvenile is duller and browner than adult. Race *aequatorialis* differs from nominate in having cheeks and throat tinged buff, upper breast and sides deeper chestnut. VOICE. A rather gravelly "chrrt" noise is commonly uttered in flight.
Habitat. Cultivation and human habitations, including towns. To c. 1300 m; locally to c. 2000 m in Ecuador.
Food and Feeding. Details of diet not known; aerial insects. Feeds in flocks, often low over ground; mixes with other hirundines. Often forages over water.
Breeding. Jan-Aug. Colonial. Nest enclosed, often with elongated entrance tunnel on side, made of mud pellets, attached to cliff face or under eaves of building. Clutch size and incubation and fledging periods not documented, probably similar to those of *P. fulva*.
Movements. Probably resident; post-breeding dispersal recorded in Ecuador.
Status and Conservation. Not globally threatened. Uncommon to locally common in Ecuador and fairly common in Peru; has limited range. In Ecuador, largest colonies at Celica and Sozoranga (in Loja) and at Portolevo (El Oro), also nests on city buildings in Guayaquil (Guayas); outside breeding season often local, but sometimes in very large flocks (e.g. at roost under bridge over R Daule). Thought to have increased in Ecuador; large numbers now breed in urban sites on Santa Elena Peninsula (W Guayas), where apparently not present in 1950s. Presumed to have benefited from frequent use of houses as nest-sites.
Bibliography. Best & Clarke (1991), Best *et al.* (1997), Bloch *et al.* (1991), Garrido *et al.* (1999), Hellmayr (1935), Kirchman (1998), Kirchman *et al.* (2000), Parkes (1993b), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Ridgely *et al.* (1998), Schulenberg & Parker (1981), West (1995), Zimmer (1955a).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family MOTACILLIDAE (PIPITS AND WAGTAILS)



- Small to medium-sized, mostly terrestrial passerines with short neck, long tail, long legs and toes; plumage mostly brown or brownish, often streaked, some species black and white, some with yellow or orange.
- 11·5-24 cm.



- Cosmopolitan, mostly Old World.
- Mostly open habitats, often grassland, a few species in wooded habitats; often near water.
- 6 genera, 65 species, 212 taxa.
- 5 species threatened; none extinct since 1600.

Systematics

The family Motacillidae comprises a group of small insectivorous passerines, the majority of which feed and nest on the ground. Most members of the family are African or Eurasian, with rather few exclusively New World species. The family is currently divided into six genera, comprising a total of 65 species. The genus *Anthus*, by far the largest, contains 43 species of pipit, while *Motacilla* is the next largest, with eleven wagtail species. The longclaws are made up of two species of *Hemimacronyx* and seven of *Macronyx*. The remaining two genera, *Tmetothylacus* and *Dendronanthus*, are both monotypic, represented by, respectively, one pipit and one wagtail.

Of the 65 motacillids currently recognized, as many as 28, including all nine members of the two longclaw genera, breed entirely within the Afrotropics, and one of the *Motacilla* wagtails is confined to Madagascar. One species, the Long-billed Pipit (*Anthus similis*), breeds both in Africa and in southern Asia. Twelve motacillids breed only in Asia, and a further nine have breeding ranges covering both Asia and Europe and, in five cases, extending also to north Africa or extreme north-west America, or to both. The Rock Pipit (*Anthus petrosus*) is the only member of the family restricted as a breeding species to Europe. Two species, both in the genus *Anthus*, are exclusively Australasian in distribution. By comparison with the Old World, America has few pipits and wagtails. Indeed, only a single species, Sprague's Pipit (*Anthus spragueii*), is found solely in North America, while the Buff-bellied Pipit (*Anthus rubescens*) breeds both there and in eastern Asia, and one pipit and two wagtails extend marginally into western Alaska from their Palearctic ranges. Seven pipits occur in the Neotropical Region. Of these, just one extends northwards into Central America and another breeds also in the Falkland Islands. Finally, two interesting pipits are restricted to oceanic islands in the Atlantic. These are Berthelot's Pipit (*Anthus berthelotii*), resident in Madeira and the Canaries in the east Atlantic Ocean, and the South Georgia Pipit (*Anthus antarcticus*), which is found only on the subantarctic island of that name.

Arguments, sometimes quite bitter, have long reigned over the taxonomic status of some geographical forms and of morphologically distinct populations of wagtails, pipits and longclaws. The pipits, in particular, have been the subject of much debate. Recent research, especially that involving DNA, suggests that perhaps nine to twelve current subspecies of *Anthus* and five of *Motacilla* may be better treated as full species. Some of these proposed taxonomic changes may be acceptable according to the criteria of what constitutes a "phylogenetic species", but not necessarily by those defining the concept of a "biological species".

It was previously thought likely, on the basis of the current distribution of members of the Motacillidae, that the family evolved in Africa. More recent analytical studies of mitochondrial and nuclear DNA, especially those by G. Voelker, published in 1999 and 2002, and the work by P. Alström and K. Mild, published in 2003, suggest, however, that the genera *Anthus*, *Dendronanthus* and *Motacilla* have an eastern Asian origin, with



Since the 1980s, there has been considerable interest in non-breeding gatherings of Buffy Pipits (Anthus vaalensis), *Long-billed Pipits* (A. similis) *and Grassveld Pipits* (A. cinnamomeus) *in the region of Kimberley, South Africa. They contained some individuals that defied conclusive identification, until described as two new species: the Kimberley Pipit* (A. pseudosimilis); *and the* ***Long-tailed Pipit****. The first of these is difficult to identify, and somewhat controversial, but the latter is easily picked out by its more horizontal posture and exaggerated tail-wagging; DNA analysis seems to confirm that it deserves separation at the species level, but its breeding grounds remain unknown.*

[*Anthus longicaudatus*, Kimberley, South Africa. Photo: Tom Goossens]

Macronyx, *Heteromacronyx* and *Tmetothylacus* presumably evolving in Africa.

The relationships of Motacillidae have also been open to speculation. At various times in the past, the family has been allied to twelve different passerine families. Work on egg-white proteins suggested affinities with the Old World warblers (Sylviidae) or the Old World flycatchers (Muscicapidae), but chromosomal studies indicated otherwise. In the mid-1980s, the initial DNA studies by C. G. Sibley and J. E. Ahlquist suggested, perhaps rather surprisingly, that Motacillidae should be treated as a subfamily of the weavers (Ploceidae), in which, among others, the Old World sparrows (Passeridae) and the waxbills (Estrildidae) would also be included as subfamilies. Later, these authors concluded that it should be placed between the accentors (Prunellidae) and the sparrows, and suggested that branchings of the passerine lineages occurred within a period of 5 million years.

In 1998, Voelker and S. V. Edwards reported on their molecular-genetic studies of the Motacillidae and possible relatives. In an attempt to determine phylogenetic relationships, they examined a range of wagtails, pipits and longclaws, as well as accentors, Old World sparrows, thrushes (Turdidae), wrens (Troglodytidae) and waxwings (Bombycillidae). Using different models for analysis, they found that all methods supported the contention that Prunellidae and Passeridae were more closely related to Motacillidae than were the other groups that they considered. Passeridae proved to be the closest to Motacillidae in one method, while Prunellidae was closest in another. These authors considered that the inability to determine which of the two families was the more closely related to Motacillidae might also be due to a rapid evolution of all three families.

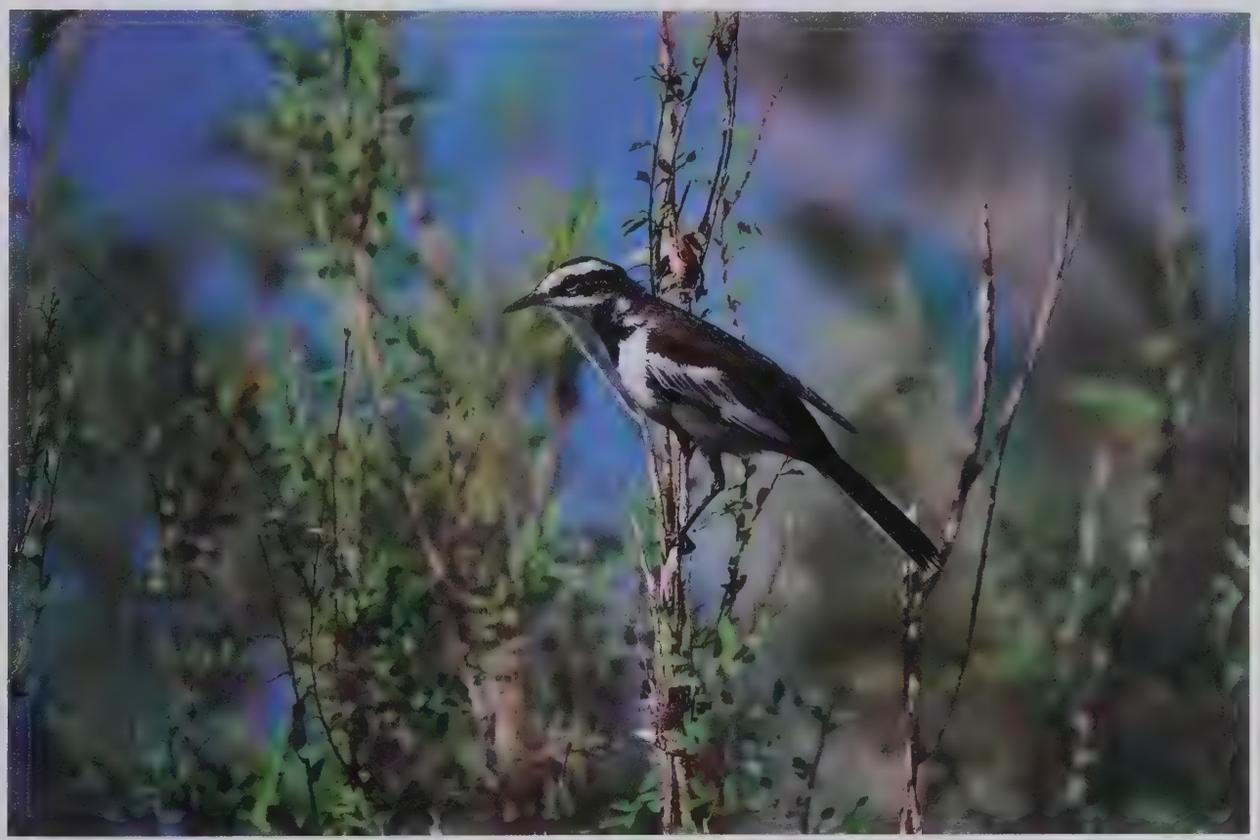
These recent molecular analyses suggested that, in all methods of phylogenetic reconstruction, the Motacillidae contained three groups. The first comprises the Forest Wagtail (*Dendronanthus indicus*) of Asia, and the second consists of the remaining wagtails in the genus *Motacilla*. The third group is made up of the "true" pipits in the genus *Anthus*, the Golden Pipit (*Tmetothylacus tenellus*), and the longclaws in the Afrotropical genera *Macronyx* and *Hemimacronyx*.

K. H. Voous considered the genera *Motacilla* and *Macronyx* to be more advanced than *Anthus*, which is generally supposed to be the oldest genus in the family. Voelker suggested that *Anthus* arose nearly 7 million years ago in the Miocene, probably in eastern Asia, and that, between 6 million and 5 million years ago, *Anthus* species were present in Africa, the Palearctic and North and South America. Speciation rates were high through the Pliocene period and quite low during the early Pleistocene. He further noted that there had been few intercontinental movements of pipits since 5 million years ago, and that these had been largely restricted to an interchange of birds between Africa and Eurasia. Species "swarms" in North America, Africa and Eurasia, but not in South America or Australia, are the products of multiple invasions, rather than being solely the results of within-continent speciation. Dispersal has therefore, Voelker argued, played an important role in the group's distribution.

As mentioned at the beginning of this section, the genus *Anthus* is the largest in the family. It has representatives throughout the world, with nine species in the motacillid-impoverished New World. Pipits are notoriously difficult to identify in the field, the majority being in general brown or brownish and often streaked. While some world checklists have recognized 34 species of *Anthus*, others list 38 and in some cases 40. Although the current treatment recognizes 43 species, the taxonomy of pipits is still being debated, and new species being described. It is likely that the results of further work on molecular phylogeny will lead to the upgrading of at least nine taxa to the level of full species.

There is still much uncertainty over the specific or subspecific status of many populations of pipits, and much disagreement among taxonomists. For example, controversy exists over the Plain-backed (*Anthus leucophrys*) and Buffy Pipits (*Anthus vaalensis*) of Africa, with various subspecies placed with the former by some authorities and with the latter by others. It is worth remembering that it was not until 1998 that it was generally accepted that the Water Pipit (*Anthus spinoletta*), the Rock Pipit and the Buff-bellied Pipit were three distinct species. Until then, they had generally been regarded as conspecific, representing subspecies of a single species with a distribution extending across the entire Holarctic Region, despite the fact that they show significant differences in habitat preference (see Habitat).

The complexity of the situation is perhaps best illustrated by the taxonomic history of the species known as "*Anthus novaeseelandiae*". Now treated as referring only to a group of nine



The first wagtails of the "black-and-white" group collected in Indochina were misidentified as the race alboides *of the White Wagtail* (Motacilla alba). *This mistake was reiterated in ornithological literature until living birds were studied in the 1990s. It soon became clear that a different species was involved, and that it was one of the most specialized of motacillids, endemic to the lower Mekong and its larger tributaries in Cambodia, southern Laos, and, marginally, Thailand and Vietnam, especially on braided river channels supporting a distinctive mosaic of shrubby islets. The* ***Mekong Wagtail*** *is the only bird endemic to this fragile aquatic system, which is coming under increasing threat from a suite of development projects.*

[*Motacilla samveasnae*, Kampi pool, Kratie, Cambodia. Photo: Pete Davidson]



The name Anthus novaeseelandiae *once referred to an extremely variable species that ranged from South Africa through Asia all the way to New Zealand. It has now been split into four so that nine races (including the nominate) become the Australasian Pipit; resident South-east Asian forms become the Paddyfield Pipit* (A. rufulus)*; African races become the Grassveld Pipit* (A. cinnomomeus)*; and migratory Asian birds become* ***Richard's Pipit****. At first, all these taxa were assumed to form a superspecies, but recent DNA studies suggest that they are not very closely related. Moreover, further subdivisions at the species level are highly likely.*

[*Anthus richardi*, Sohar, Oman. Photo: Hanne & Jens Eriksen]

Australasian subspecies, it was previously considered to include numerous other races that occur over a vast range extending from the Afrotropics, western Siberia and the Russian Far East through southern Asia and Australasia to several oceanic archipelagos. In 1986, however, this large complex of taxa was split into several species, based on geographically isolated populations or groups of subspecies. Thus, Richard's Pipit (*Anthus richardi*), comprising only the migratory Asian populations, the Paddyfield Pipit (*Anthus rufulus*), containing the sedentary races of southern and South-east Asia, and the Grassveld Pipit (*Anthus cinnamomeus*), representing the African races, are now recognized by most authors as full species, together forming a superspecies with the Australasian Pipit (*Anthus novaeseelandiae*). In addition, the populations breeding in New Guinea and Australia are regarded by many ornithologists as constituting a further species, distinct from that found in New Zealand and on the island groups to the south and east.

Moreover, much heated discussion has centred on the further separation from the Grassveld Pipit of some mountain forms. The population that breeds on the high plateaux of Lesotho is now accepted by most authorities as a separate species, the Mountain Pipit (*Anthus hoeschi*), because it has different calls and displays from those of the local race *rufuloides* of the Grassveld Pipit, and the two show segregated breeding where they occur together. Jackson's Pipit (*Anthus latistriatus*), thought to breed in montane grasslands bordering the Rift Valley, is distinctive not only in its very dark plumage coloration but also in its vocalizations; nevertheless, it is regarded by many as simply a dark morph of the Grassveld Pipit. In addition, the population found in the highlands of south-east Nigeria and west Cameroon is thought by some to represent a further species, although its treatment as such is strongly disputed by other taxonomists.

There seems to be less disagreement with regard to the taxonomic status of the Woodland Pipit (*Anthus nyassae*). This species was formerly treated as a subspecies of the Long-billed Pipit, and the two are, indeed, very similar in appearance and have similar songs. They differ significantly, however, in ecology: the Woodland Pipit frequents miombo woodland in Zambia and adjacent countries, whereas the Long-billed Pipit favours boulder-strewn hillsides with sparse bush or tree cover through southern and eastern Africa.

Two new African species have come to light in recent years, both detected among wintering pipits on grassland around Kimberley, in South Africa. These are the Long-tailed Pipit (*Anthus longicaudatus*), first described as a separate species in 1996, and the Kimberley Pipit (*Anthus pseudosimilis*), described as recently as 2002. Furthermore, it is believed that an undescribed *Anthus* taxon, very similar to the Long-billed Pipit, in Kenya may represent either a new species or, perhaps more likely, an undetected race of the Woodland Pipit. If it proves to be the latter, then this would represent a considerable extension of that species' range.

Despite, or perhaps because of, the lack of agreement on species, subspecies and relationships, no attempts had been made to hypothesize the phylogenetic relationships among all of the species of *Anthus*. Recently, however, various morphological characters have been used in an effort to classify the pipits. These included plumage colour and pattern, shape and length of the hind claw, tail pattern, wing formula and overall body size. In 1999, Voelker published information on his investigation of the nucleotide sequencing of the mitochondrial cytochrome *b* gene, a study aimed at determining relationships among 41 supposed species of pipit. From his molecular studies and his hypothetical phylogenetic tree, Voelker argued that few of the morphological characters used by earlier taxonomists were truly useful in demonstrating relationships, and that some were, in fact, misleading. For example, some taxonomists believed that species with yellow axillaries, namely the Rosy (*Anthus roseatus*), Striped (*Anthus lineiventris*) and Yellow-tufted Pipits (*Anthus crenatus*), or those with green wing edges, the Rosy and Olive-backed Pipits (*Anthus hodgsoni*), were closely related to each other, but this was not borne out by his molecular studies and his resulting hypothetical phylogenetic tree.

Voelker's analyses of DNA sequences supported four major groups, or clades, within the genus. The first clade comprises the three small-bodied African species, the Sokoke Pipit (*Anthus sokokensis*), the Bush Pipit (*Anthus caffer*) and the Short-tailed Pipit (*Anthus brachyurus*), a grouping that had previously been recognized by several authors on the basis of the morphological characters of body size, wing formula and hind-claw shape. B. P. Hall and R. E. Moreau thought that the Sokoke and Bush Pipits were most closely related, but this was not borne out by Voelker's hypothesis. The second is a largely Palearctic clade. It includes







These photographs show rather different-looking birds, but each of them is a ***Yellow Wagtail****. They are just three of the many subspecies which, despite marked differences in plumage, are genetically almost identical. Interbreeding freely at overlap zones, and producing fertile hybrids, they defy separation under the biological species concept. Nevertheless, certain forms retain consistent differences in plumage and voice on either side of a narrow zone of intergradation, suggesting that their status very closely approaches that of viable species. Thus, the Yellow Wagtail complex is a systematic conundrum, which many decades of research have failed to decipher. One recent analysis suggests that it may justify being split up into three species-groups:* taivana*;* flava*; and* tschutschensis*. Another analysis linked* taivana, tschutschensis *and* macronyx *as one group, and the Western Palearctic forms as another species. Further molecular work concluded that the entire complex was paraphyletic, in other words that all its constituent forms shared a common ancestor, but not all descendants of the ancestor were included in the grouping. These sets of results are somewhat contradictory, underlining that they rely to some extent on subjective interpretation and the vagaries of laboratory technique. Clearly, a great deal more research is required before a stable taxonomy gains widespread acceptance, and until that time the Yellow Wagtail, in its innumerable manifestations, is best retained intact.*

[Top: *Motacilla flava lutea*, Sohar, Oman. Photo: Hanne & Jens Eriksen.

Middle: *Motacilla flava beema*, Sohar, Oman. Photo: Hanne & Jens Eriksen.

Bottom: *Motacilla flava feldegg*, Israel. Photo: Markus Varesvuo]

the Buff-bellied, Meadow (*Anthus pratensis*), Rock, Water, Rosy, Red-throated (*Anthus cervinus*), Pechora (*Anthus gustavi*), Olive-backed and Tree Pipits (*Anthus trivialis*). The third clade is an American one that consists of the Correndera (*Anthus correndera*), South Georgia, Paramo (*Anthus bogotensis*), Hellmayr's (*Anthus hellmayri*), Sprague's, Yellowish (*Anthus lutescens*) and Short-billed Pipits (*Anthus furcatus*). The Correndera and South Georgia Pipits were found to be sister-taxa, as Hall contended in 1961, but these species did not form a superspecies with the old "*A. novaeseelandiae* complex". The molecular phylogeny supported a sister relationship between the Yellowish Pipit and Sprague's Pipit, rather than, as Hall suggested, between Sprague's and Short-billed Pipits. The fourth and largest clade is African, Eurasian and Australasian, and comprises 18 species. Within this last group, Voelker's phylogenetic tree did not show a close relationship among the species previously included within *A. novaeseelandiae*, except that Richard's and Paddyfield Pipits were apparently sister-species. Both the African and the Australasian taxa were more closely related to other species, the African ones to the Long-billed Pipit, and the Australian and New Zealand ones to the Woodland Pipit. Moreover, molecular studies of New Zealand taxa suggested that some populations on small islands near New Zealand warranted species status.

The analyses by Voelker further suggested that a number of geographically separated races were not, in fact, closely related to the species in which they were placed. For example, the subspecies *brasilianus* of Hellmayr's Pipit and the subspecies *catamarcae* of the Correndera Pipit are geographically remote from other populations of those species, and probably merit full species status. In addition, Voelker found the newly recognized Long-tailed Pipit to be closely related to the Buffy Pipit, and that a population of the Long-billed Pipit was sufficiently distinct to be separated as a new species, the Kimberley Pipit.

Evidence from the "molecular clock", which theoretically predicts that molecular change is constant throughout time and space, suggests that speciation came about through the following dispersal events. Africa was invaded by *Anthus* from South-east Asia and Mongolia twice, about 6·5 million years ago and, again, more than 3·5 million years ago. About 2 million years later the Australasian Pipit arrived in its present area, having moved across Arabia and southern Asia from Africa, where it had a common ancestry with the Woodland Pipit. Present-day Neotropical forms arrived through North America, where the ancestral form(s) became extinct, about 6 million years ago. Sprague's Pipit resulted from a divergence from the South American Yellowish Pipit, which subsequently reinvaded North America. The South Georgia Pipit reached its present home from South America about 1·5 million years ago. Later, there was a dispersal from north-east Asia into Alaska; a further movement through that route, as well as dispersals from north-east Africa to west Asia, from south-east Europe to north Africa and from west Europe to Greenland, took place much more recently. The molecular clock further suggests that the separation of the Correndera and South Georgia Pipits, of Hellmayr's and the Paramo Pipit, and of the Afrotropical Long-billed and Malindi Pipits (*Anthus melindae*) occurred over a period of about 1-2 million years.

These results support the contention that dispersal, rather than the range-splitting effects of climatic or geological barriers, was a major factor in the speciation processes in the genus *Anthus*. This is because the time scale would appear to be too short for major climatic events, or geological ones such as plate tectonics, to have been an important influence.

The taxonomy of the pipits is clearly in a state of flux. Molecular studies are a relatively new technique and will continue to develop, but already they have shed much light on the likely affinities of species. These studies, however, need to be supported by, and interpreted together with, other information, including that derived from behavioural and ecological studies.

Following the pipits, three other motacillid genera form an all-African group of ten species. Seven species of longclaw make up the genus *Macronyx*. Sharpe's Longclaw (*Hemimacronyx sharpei*) of Kenya was formerly classified in this genus, but is now generally placed in the genus *Hemimacronyx*, along with the Yellow-breasted Pipit (*Hemimacronyx chloris*) of South Africa, which was previously included in *Anthus*. A few taxonomists do not recognize the genus *Hemimacronyx* and prefer to retain these two species in their former respective genera. The recent molecular studies, however, provided evidence to support an earlier assertion that the Yellow-breasted Pipit is not a true pipit. Voelker and Edwards thought it reasonable, therefore, to place it, together with Sharpe's Longclaw, in *Hemimacronyx*. Their molecular work also indicated that all pipits and longclaws with yellow underparts, namely the Golden Pipit in the monotypic



*The **Australasian Pipit** currently comprises nine subspecies, several of which are isolated geographically. This photograph shows the race* chathamensis, *which is endemic to the remote Chatham Islands in the South Pacific. It is said to differ from nominate birds in its buffier underparts, although this individual looks predominantly white below, with a broad pale supercilium and fine markings on the chest. This form, and several others in the* Anthus novaeseelandiae *complex, may warrant treatment as separate species. A full review of morphological, behavioural and genetic data is required.*

[*Anthus novaeseelandiae chathamensis*, Chatham Island, New Zealand. Photo: Robin Bush/ Oxford Scientific Films]



The pipits are sexually monomorphic, essentially terrestrial, and relatively homogeneous in terms of behaviour and morphology. With its dull plumage and slender bill the ***Grassveld Pipit*** *is a typical example. Like all its congeners, the upperpart plumage is drab brown and slightly mottled, to provide camouflage against soil and stones; the underparts are pale, with darker speckling on the chest. As an adaptation to its terrestrial lifestyle, the legs, toes and claws are long and strong. This feature is common to all motacillids, allowing them to run at high speeds and to adopt a tall upright posture when scanning for prey or predators. Another family characteristic clearly shown in this photograph is the great length of the tertial feathers: in contrast to the situation in most passerines, they cloak the primaries almost entirely. This feature probably serves to protect the flight-feathers from the constant glare and sunlight which falls on open-country birds and eventually causes their plumage to fade and become brittle.*

[*Anthus cinnamomeus rufuloides*, Midmar Nature Reserve, KwaZulu-Natal, South Africa. Photo: HPH Photography/ Photo Access]



*This **Cape Longclaw** shows off the origin of the name "longclaw". As in some pipits, and a range of other ground-dwelling birds, the hind claw in* Macronyx *is curved and elongated, presumably as an adaptation to a terrestrial lifestyle. In terms of general appearance, the longclaws are not unlike the pipits but they differ in being sexually dimorphic and relatively robust, a little more lark-like, with much brighter underparts. There are seven species in total, all of which have pink, yellow or orange on the throat or belly, and six of which have a black breastband, echoing a pattern commonly found in wagtails* (Motacilla).

[*Macronyx capensis colletti*, Wakkerstroom, eastern South Africa. Photo: Johannes Ferdinand]

Tmetothylacus and all species of *Hemimacronyx* and *Macronyx*, appear to be close relatives.

Turning to the wagtails, the Forest Wagtail of Asia is placed in a monotypic genus, *Dendronanthus*, rather than with the *Motacilla* wagtails. Molecular studies did not produce any convincing evidence with regard to its relationships with the other motacillids. The Forest Wagtail resembles *Motacilla* in general plumage, but behavioural and morphological studies, as well as egg colour, suggest that it may be closer to *Anthus*. For example, it looks and acts more like a pipit when on the ground and, as some *Anthus* species, it spends much time in trees; the latter trait, however, is also exhibited to some degree by the Grey (*Motacilla cinerea*) and Mountain Wagtails (*Motacilla clara*). Perhaps importantly, it is associated with woodland, and not closely with water. Voelker and Edwards, therefore, considered that *Dendronanthus* should be placed closer to *Anthus* than to *Motacilla*, as suggested by one of their trees of motacillid relationships.

The genus *Motacilla* includes eleven species of wagtail, the most recently described of which, the Mekong Wagtail (*Motacilla samveasnae*) from southern Indochina, was first named in 2001. *Motacilla* is an Old World group, breeding mainly in the Palearctic and Oriental Regions. Three species are Afrotropical, and one other is confined to Madagascar. Two members of the genus have extended their ranges to the New World, where the Yellow Wagtail (*Motacilla flava*) and the White Wagtail (*Motacilla alba*) both breed on the tundra in Alaska, thereafter migrating to eastern Asia; the White Wagtail breeds also in south-east Greenland.

Voelker suggested that *Motacilla* arose in the eastern Palearctic 4·5 million years ago, and within a short time colonized Africa, where the prevailing climate had resulted in extensive areas of grassland in the north-east. A re-expansion of forests isolated the first colonists, and a subsequent shift back to grassland allowed a second colonization of this continent to take place about 2·9 million years ago. Although he believed that the early flooding of the Mediterranean and of the Red Sea might have presented a barrier to ancestral intercontinental movements by *Anthus*, these and similar events appear not to have been an important factor for *Motacilla*. In more recent times, the White Wagtail has colonized north Africa and North America, reaching the latter via both Alaska and Greenland, and the Yellow Wagtail has colonized North America from the eastern Palearctic and north Africa from the west Palearctic. Similarly, the Grey Wagtail has reached north Africa and some Atlantic islands.

According to the results of this research, environmental changes caused by climatic shifts would have led to the Afrotropical species diverging from the Eurasian ones. In Eurasia itself, it seems likely that glacial activity was an important factor in motacillid speciation events, particularly in the region of the Ural Mountains and the Yenisey River, resulting in the separation of western Palearctic forms from eastern ones.

Previously, the general consensus has been that *Motacilla* consisted of three superspecies. These are the "yellow group", the "stream group" and the "pied group". The first contains the Yellow, Citrine (*Motacilla citreola*), Cape (*Motacilla capensis*) and Madagascar Wagtails (*Motacilla flaviventris*), and the second comprises the Grey Wagtail and the Mountain Wagtail. The third, the "pied group", consists of the White Wagtail, the White-browed Wagtail (*Motacilla maderaspatensis*), the Japanese Wagtail (*Motacilla grandis*) and the African Pied Wagtail (*Motacilla aguimp*). The recently described Mekong Wagtail would belong to the last group. The validity of these groupings, however, is not borne out by recent studies involving analyses of mitochondrial DNA, which indicate that none of the three supposed superspecies is monophyletic.

In the 1930s, some taxonomists argued that the Madagascar and Mountain Wagtails were conspecific with the Grey Wagtail. C. E. Vaurie refuted this, maintaining that the three were morphologically quite distinct, but he considered that the White Wagtail and the African Pied Wagtail were conspecific, a view doubted by others. J. M. Winterbottom believed that the Cape Wagtail was close to the original form from which the Palearctic wagtails diverged, and that the "White Wagtail group" evolved from this ancestral form by suppression of yellow coloration and intensification of black. The "Yellow Wagtail group" had, he argued, evolved by the processes of a shortening of the tail and an increase in the amount of yellow, and the "Grey Wagtail group" by a lengthening of the tail and an increase in the yellow in some cases. Other taxonomists, such as M. P. S. Irwin, believed that the Cape Wagtail was allied to the Yellow and Citrine Wagtails.

Recent molecular-genetic studies, by Voelker and by A. Pavlova and colleagues, indicate that the Mountain and Cape Wagtails are sister-taxa, forming a sister-group to the Madagascar



As a rule, the "true" wagtails are much more boldly patterned than pipits and longclaws. One of their most characteristic traits is behavioural, giving rise to their English name: they wag their tails almost incessantly, especially after alighting on a new perch. In addition, their tails are very long, with distinct white edges to the outer rectrix. Unlike most pipits, the wagtails have blackish legs. The genus Motacilla *falls quite neatly into three informal styles, the "black-and-white", the "yellow" and the "riverine" groups. The* ***African Pied Wagtail*** *is clearly a member of the first group. According to some molecular analyses, but not others, it forms part of the White Wagtail* (M. alba) *superspecies.*

[*Motacilla aguimp vidua*, KwaZulu-Natal, South Africa. Photo: Jurgen & Christine Sohns/FLPA]

Wagtail, which, in turn, is a sister-taxon to all other *Motacilla* wagtails studied. Controversially, and significantly, the Yellow and Citrine Wagtails as currently constituted were both found to be paraphyletic. The west Palearctic race *werae* of the Citrine Wagtail and the Mongolian and east Asian race *taivana* of the Yellow Wagtail are grouped separately from the east Palearctic form of the former and the north-east Asian race *tschutschensis* of the latter. The implication is that the Citrine Wagtail should be split into two species, as *M. citreola* and *M. werae*, and the Yellow Wagtail into three species, as *M. flava*, *M. taivana* and *M. tschutschensis*. The Grey Wagtail then becomes a sister-taxon to all of those except *M. flava*, and this larger group is then a sister to the White and White-browed Wagtails, with the African Pied Wagtail becoming a sister-taxon to all of these. The newly constituted *M. flava*, restricted to the western Palearctic and central Asian races, and being a sister-taxon to the group containing all



The ***Forest Wagtail*** *is a fascinating bird of unknown ancestry. It is patterned more like a wagtail, behaves more like a pipit, and is more arboreal than either. Its pale supercilium, prominent wingbars and double breastband give the impression of a wagtail, but its horizontal posture, pink legs and habit of perching in trees suggests that it should perhaps be placed closer to* Anthus *than to* Motacilla, *a contention supported by some molecular studies. To date, however, such studies have failed to offer any convincing insight regarding its affinities, so it remains in its own monotypic genus. Interestingly, it does not wag its tail up and down, but from side to side in a strange exaggerated motion.*

[*Dendronanthus indicus*, Wajima, west central Honshu, Japan. Photo: Hirozo Maki]



*The **Golden Pipit** is another distinctive species occupying a monotypic genus. The male has brilliant yellow underparts and a black breastband, thus indicating a closer relationship with the* Hemimacronyx *and* Macronyx *longclaws than with the* Anthus *pipits. It occurs in overgrown shrubby grassland of a kind shunned by most other motacillids, where it often perches on top of bushes, as shown here. This photograph also clearly reveals the Golden Pipit's most unusual feature: it is the only passerine with the lower portion of the tibia unfeathered. No functional explanation has been forwarded for this peculiarity, nor do we know why it should be so rare.*

[*Tmetothylacus tenellus*, Buffalo Springs National Reserve, Kenya. Photo: Martin B. Withers/ FLPA]

of the aforementioned taxa, is thus separated considerably from the other forms with which it has traditionally been considered conspecific. Finally, the group containing the Mountain, Cape and Madagascar Wagtails, which form a clade, separated from all other wagtails within 100,000 years from the time when the genus first colonized Africa.

Alström and A. Ödeen reached similar conclusions on the evidence obtained from their analyses of mitochondrial DNA. When looking at nuclear DNA, however, they found evidence indicating that the "White Wagtail superspecies" was a sister-taxon to the Citrine Wagtail *sensu lato*. This clade appeared to be a sister to one group of Yellow Wagtail subspecies, namely the nominate race and *iberiae*, *cinereocapilla*, *pygmaea* and *thunbergi*. The other Yellow Wagtail clade, consisting of the races *tschutschensis*, *macronyx* and *taivana*, becomes a sister to the Grey Wagtail, which in turn is sister to the Cape, Mountain and



*Juvenile pipits are much like their parents, but young wagtails are relatively duller than theirs. Compared with adults they have less well-defined head and underpart patterns, tending towards buffy or greyish where adults might be black; this juvenile **White Wagtail** is a perfect example. Young birds also tend to have a small orange flange at the gape. The identification of juvenile wagtails is slightly more complex than that of adults, in some cases because the species lack yellow pigmentation when young. Thus the adult Citrine Wagtail* (Motacilla citreola) *is mostly stunning yellow, but the juvenile is an anonymous-looking mixture of grey, black and white.*

[*Motacilla alba alba*, Navarre, Spain. Photo: José Luis Gómez de Francisco]

Madagascar Wagtails. Thus, whereas the Citrine Wagtail remains intact, the Yellow Wagtail appears as two quite separate species, but the "Cape Wagtail group" seems robust and its treatment as such is supported by all studies.

Plumage characters, with additional evidence from vocalizations, support trees based on nuclear DNA work more strongly than they do those based on mitochondrial DNA. Studies by Y. A. Red'kin and V. G. Babenko found that hind-claw structure and the plumage characters of juvenile, first-winter and adult female individuals supported the contention that *taivana* and *macronyx* are sister-taxa, and that these, together with *tschutschensis*, *simillima* and *plexa*, form a group separated from all other Yellow Wagtail races. Ödeen suggested that *thunbergi* and *macronyx* are probably convergent, that *taivana* may be distantly related to the western group of subspecies, and that *simillima* and *macronyx* belong to the western group but resemble *taivana* as a result of introgression of *taivana* genes or those of an extinct close relative.

A further example of the difficulties and uncertainties surrounding the relationships of the *Motacilla* wagtails concerns the African Pied Wagtail. The results of nuclear DNA studies indicate that this species forms part of the *M. alba* superspecies, whereas analyses of mitochondrial DNA contradict this. Alström and Ödeen suggest that the lack of congruence between trees based on different areas of evidence is due to convergence, old introgression, different rates of evolution of characters, and random sorting of ancestral variants of mitochondrial DNA.

Irrespective of molecular-genetic findings, a number of wagtail subspecies have, over the years, been treated as distinct species by various authors. These opinions have been based largely on differences in voice, plumage and structural characters. Not surprisingly, several of the well-marked races of the Yellow Wagtail, especially *lutea*, *feldegg* and *taivana*, have sometimes been considered to be separate species. Equally, some authorities recognize the distinctive eastern black-backed subspecies *lugens* of the White Wagtail as a full species, known as the "Black-backed Wagtail", and the same treatment is afforded by some authors to other White Wagtail races, such as *personata*, the "Masked Wagtail". Similarly, the north-western race *simplicissima* of the Cape Wagtail is sometimes treated as a full species. In contrast, Alström and Mild, in their 2003 monograph, regarded some widely recognized subspecies as being indistinguishable in terms of plumage. In the case of the Yellow Wagtail, for example, they synonymized *angarensis* and *simillima* with *tschutschensis* and merged *melaneogrisea* with *feldegg* and *plexa* with *thunbergi*, and they found *werae* to be inseparable from the nominate race of the Citrine Wagtail and *dukhunensis* inseparable from the nominate race of the White Wagtail.

Quite clearly, a great deal of additional research is required, both in the field and in the laboratory, before the relationships of the genera, species and subspecies in the family Motacillidae, and the true status of some of the taxa, are understood. It should be borne in mind that much of the recent work involving DNA analyses is, in some respects, rather speculative, and the conclusions drawn are to some extent subjective and open to individual interpretation. Although there seems little doubt that at least some of the findings of investigative research of this nature will ultimately prove to be accurate, and the decisions based on such work sustainable, studies involving DNA are still in their infancy. Moreover, many more years of work on molecular genetics are desirable before the implications of the findings thus derived are understood with sufficient confidence. For the present, it is considered more appropriate, therefore, to adopt a more traditional approach to the classification of the Motacillidae, especially at the species and subspecies level.

Morphological Aspects

All members of this family have certain striking similarities. They are all small to medium-sized, short-necked, slender, elongated, long-tailed insectivorous passerines, and they all possess long, often pale or flesh-coloured legs, toes and hind claws. The sexes are similar in size. The hind toe of most species is elongated, and in the case of some longclaws can reach 4 cm in length.

Differences in tail length and in the shape and length of the hind claw are useful in the separation of motacillid species, especially the pipits. Ground-dwellers have a long, slightly curved hind claw, whereas that of arboreal species is generally shorter and more curved. The wing has nine long primaries, and a much-reduced tenth; the tertials are generally long. The outer feathers of the long tail are variably edged white or buff. All motacillids



At least 70% of motacillids prefer to live in grassland or other open-country vegetation. The ***Meadow Pipit****, for example, breeds in natural habitats such as tundra, moorland, meadowland, heathland, bog and saltmarsh. Because of its predilection for open habitats this species was pre-adapted for survival in man-modified environments such as fallow arable land and rough pasture. This tolerance of agricultural landscapes makes it one of Europe's commonest birds.*

[*Anthus pratensis pratensis*, Clwyd, Wales. Photo: Mike McKavett/ Windrush]



*The **Correndera Pipit** occurs in South American grassland, especially in moist pastures. In the lowlands of Argentina it abounds in the* pampas *region, where it is the commonest pipit. It also occurs further south, in Patagonia, but here it occupies taller and wetter grassland because it is otherwise outnumbered and outcompeted by the Short-billed Pipit* (Anthus furcatus). *Another population is Andean, ranging through the mountains of north Argentina, Bolivia and south Peru, where it inhabits* puna *grassland, arid plains, pastures, bogs and lakeshores.*

[*Anthus correndera correndera*,
Esteros del Iberá,
Corrientes, Argentina.
Photo: Hernán Povedano]

have a bill that is long, pointed, notched and often slender, with a nasal operculum and rictal bristles.

Although the *Macronyx* longclaws are considerably larger than the pipits and wagtails, there is otherwise rather little size variation within the family. The smallest species include the Short-tailed Pipit of Africa, with a body length of only 11·5-12·5 cm and a wing length of just 65-70 mm, while the Bush Pipit of southern Africa and the Yellowish and Chaco Pipits (*Anthus chacoensis*) of South America are only slightly larger. Other pipits and wagtails commonly have a wing length of 80-100 mm, an overall length of 16-21 cm and a mass of 15-31 g, although Striped Pipits are heavier, weighing 30-38 g. Most *Macronyx* longclaws usually have wings exceeding 100 mm in length, and the largest species, such as the Cape (*Macronyx capensis*) and Fülleborn's Longclaws (*Macronyx fuellebornii*), weigh 46-64 g.

The sexes of most species overlap extensively in size, although the largest and heaviest individuals are usually males. In the genus *Anthus*, the two sexes are very similar in plumage. In the case of the Golden Pipit, the longclaws and the wagtails, on the other hand, the male is usually the more brightly coloured, especially in the breeding season. In addition, the male Grey



*Unlike the case of larks (Alaudidae), no pipit is a desert specialist, although a few species will straggle into barren terrain. This **Grassveld Pipit** is seen on the baked sandy soil of the Kalahari Desert, but we can be sure that grassland or tussocky plains are to be found nearby. In the Namib, not far to the north, the dry grassland gives way to endless sandy dunes, where pipits are absent and only larks survive. Part of the reason for their failure to invade truly arid environments is dietary: larks can dig for plant material and subsist on windblown seeds, while pipits are more reliant on live insects, a scarce resource wherever vegetation is lacking.*

[*Anthus cinnamomeus bocagei*,
Kalahari Gemsbok
National Park,
South Africa.
Photo: Terry Carew/
Photo Access]



Several species of pipit are restricted to montane environments. The ***New Guinea Pipit*** *falls into this bracket, usually living between 3200 m and 4500 m, though occasionally down to 2500 m, in the highlands of New Guinea, where it is the only pipit in evidence. It frequents open areas above the tree-line, especially where short grass and carpets of alpine vegetation are found. To survive at these altitudes it has to consume larger quantities of seeds and other plant material than do pipits of lower elevations, probably in part because the supply of insect food is barely sufficient.*

[*Anthus gutturalis gutturalis*, Mt Scratchley, south-east New Guinea. Photo: William S. Peckover]

Wagtail has a black throat in the breeding season, a feature only very rarely exhibited by the female.

The *Anthus* pipits are generally drab, brown birds with variable amounts of darker streaking on the back and breast. They have a worldwide distribution, and in habits and coloration they resemble larks (Alaudidae). Unlike the latter, however, they have a tarsus that is angled at the back (acutiplantar), has unbroken sheaths at the sides and has fused scales or scutes at the front, whereas the alaudid tarsus is flat at the back (latiplantar) and has the sides covered with scales. A few members of the genus, notably the Red-throated and Rosy Pipits when in breeding plumage, are more colourful. More subtle colour in the plumage is shown by the Olive-backed Pipit, which has olive-green upperparts, by both the Rosy Pipit and the Striped Pipit, which have greenish edges of the wing feathers, and by the Yellow-tufted Pipit, with its yellow axillaries. Further, two Neotropical species, the Yellowish and Ochre-breasted Pipits (*Anthus nattereri*), have the underparts suffused with yellow.

Far more striking in appearance is the Golden Pipit of north-east Africa, the male having golden-yellow underparts with a black breastband, a golden-yellow band across the wings, and a yellow rump and tail sides. The yellow underparts and black breastband make it appear similar to a small longclaw. The female and young birds, when at rest, more closely resemble true pipits, but in flight they display yellow on both the upper and the lower wing surfaces and the tail edges.

The seven species of *Macronyx* longclaw are robust, often lark-like birds. Having streaked brown upperparts, they are not unlike the pipits in general appearance, but they all have brightly coloured yellow, orange or pink underparts. Six of the species have, in adult male plumage, a black necklace or breastband reminiscent of the black or dark bands on the upper breast of the African Pied, Cape and Mountain Wagtails and of the Golden Pipit. Grimwood's Longclaw (*Macronyx grimwoodi*) lacks this breastband. Longclaws show a strong resemblance to American meadowlarks (*Sturnella*) in appearance, habitat and behaviour. As long ago as 1946, H. Friedmann drew attention to these ecological counterparts. The two *Hemimacronyx* species, the Yellow-breasted Pipit of South Africa and Sharpe's Longclaw of Kenya, have yellow underparts in breeding plumage.

Although the Asian Forest Wagtail, with its brown upperparts, also resembles a pipit when on the ground, it has a marked white supercilium, prominent white wingbars and two black breastbands, making it quite unlike any *Anthus* species. This striking plumage may suggest that it is closer to the *Motacilla* wagtails, but molecular-genetic studies indicate that it is probably more closely related to the pipits (see Systematics). It is largely arboreal, and it wags its tail from side to side, rather than up and down.

Adults of the "true" wagtails, in the genus *Motacilla*, are generally more strikingly marked or more brightly coloured than are the pipits. Instead of being brown and streaked, the wagtails either exhibit a combination of grey, black and white or have some yellow in the plumage. Young wagtails are much duller, and some of the "yellow" species, notably the Yellow Wagtail, are rather pipit-like, both in appearance and in habits. All of the wagtails, however, have a noticeably long tail with white outer feathers, and they characteristically wag the tail up and down. On the basis of general morphological characteristics, the ten species of *Motacilla* fall into three main groups: a "black-and-white group", a "yellow group", and a "riverine group". A further species, in Madagascar, does not fit easily into any one of these main cat-



*The **Upland Pipit** is another poorly known bird of the montane zone, usually found between 1200 m and 3000 m in the Himalayas and south China, though it spends the non-breeding season at slightly lower altitudes. An unusual population occurs in the highest hills of Hong Kong, where this photograph was taken, and where the species breeds between 500 m and 1000 m. In all cases, it prefers steep, boulder-strewn slopes with scattered bushes and grassy patches. Appreciable in this photo are its rather stout bill, and also its habit of perching like a sentinel on prominent rocks and other suitable vantage points.*

[*Anthus sylvanus*,
Fei Gno Shan,
Hong Kong.
Photo: Martin Hale]

egories. The first group consists of the Japanese Wagtail, the White-browed Wagtail of India and Nepal, the African Pied Wagtail and the Mekong Wagtail, as well as the various subspecies of the White Wagtail of Eurasia. All of these have predominantly black-and-white plumage, and the tail is similar in length to the wings. The yellow group comprises two Eurasian species, the Yellow and Citrine Wagtails, and the Cape Wagtail of eastern and southern Africa. These three are characterized by having the tail shorter than the wings and by displaying much yellow in the plumage. The two riverine species, the Grey Wagtail and the Mountain Wagtail, have the tail longer than the wings; both occur on fast-flowing, rocky, wooded streams, the first in Eurasia and the second in the African uplands. The Madagascar Wagtail somewhat resembles members of the yellow group, but it also has several plumage features that are reminiscent of the two riverine species.

Members of the family sometimes exhibit aberrant plumage as a result of melanism, albinism or partial albinism. Partial albinism has been noted in an African Pied Wagtail and a Grassveld Pipit. There are 17 records of Japanese Wagtails possessing aberrant plumage, and all were considered to be partial albinos. The possibility that they were hybrids between Japanese and White Wagtails, or partially melanistic White Wagtails, was thought unlikely in view of their calls and songs and their relationships with other individuals. Melanism has also been reported in an African Pied Wagtail. Soil staining, which causes local vari-



*In summer the **Rosy Pipit** breeds high in the Himalayas and associated mountain ranges from Afghanistan to Myanmar and southern China, perhaps ascending higher than any other motacillid. It has been recorded up to 5300 m above sea-level, but breeds a little lower on alpine meadows and grassy slopes, especially where snow-melt has created boggy ground. Severe conditions grip the Himalayas in winter, and the Rosy Pipit is forced to escape by descending in altitude; it reaches a lower limit of 1500 m and appears in submontane habitats such as agricultural land.*

[*Anthus roseatus*,
Shey, Ladakh, India.
Photo: Otto Pfister]





*Despite their close taxonomic alliance, the **Rock Pipit** and the **Water Pipit** occupy very different ecological niches. The Rock Pipit is a bird of open rocky seashores and estuaries; it is almost always encountered at coastal sites, and it spends most of its time within the intertidal zone. A few individuals ascend to 400 m on hills slightly inland, and others breed on rocky islands in inland lakes. The Water Pipit, in turn, breeds at much higher altitudes, usually around streams or damp grassy areas between 650 m and 3200 m, and never at sea-level. The Rock Pipit is a partial migrant, but it always favours coastal sites, while the Water Pipit provides an interesting example of a seasonal switch in habitat selection. In winter it descends to the lowlands, frequenting freshwater habitats such as rice fields, coastal lagoons and waterlogged grassland. Some birds from Central European populations travel north to Britain, where they overwinter on watercress beds, and in other suitable habitats. Given these distinct and inflexible differences in habitat requirements and migratory patterns, it now seems remarkable that this complex was previously thought to contain no more than a single species, and even more surprising that this view held sway until 1998.*

[Above: *Anthus petrosus littoralis*, Helsinki, Finland. Photo: Markus Varesvuo.

Below: *Anthus spinoletta coutellii*, Sohar, Oman. Photo: Hanne & Jens Eriksen]

ations in plumage colour, is known to affect Berthelot's Pipit and may be a widespread phenomenon.

Notwithstanding what has been stated in the preceding paragraphs, plumage differences between wagtails and pipits are not always clear-cut, this being notably so in the case of immatures and females. Some pipits bear a strong resemblance to wagtails. For example, the Buffy Pipit of southern Africa shows a distinct lack of streaks in its plumage. As its English name indicates, it is a buff-coloured bird and it could be mistaken for an immature wagtail as it forages on grassland, wagging its tail in typical wagtail fashion. So, too, might the pale, slim Tawny Pipit (*Anthus campestris*), which breeds in much of Europe and across to Tibet and winters in Africa just south of the Sahara. It is generally unstreaked, with white outer tail feathers, it has a wagtail-like build, it carries its body in a horizontal posture, as does a wagtail, and it also pumps its tail down and up. A Tawny Pipit, especially when observed at long range, could quite easily be taken for a juvenile Yellow Wagtail, although the latter, unlike the pipit, has black legs and usually some black markings on the breast. The very close relationship between the wagtails and the pipits is also evident from the remarkable similarity in the songs and parachuting courtship displays given by, for example, the Tree Pipit and the Grey Wagtail (see Breeding).

For those motacillids for which details are available, adults generally have two moults annually, one before breeding, which is normally incomplete, and one after breeding. Some species, among them the White-browed Wagtail and Berthelot's Pipit, as well as some Rock Pipits, do not undergo a pre-breeding moult. In some migratory species, the post-breeding moult is completed before the departure to winter quarters, but in others it may be completed during stopovers en route, or after arrival on the wintering grounds. Many species begin the partial pre-breeding moult while still in the wintering area, continuing the moult when they are back on the breeding grounds. Juveniles generally undergo a partial moult, involving the feathers of the head and body and some of the wing-coverts, within a month or two of leaving the nest, followed by another partial moult in the late winter and early spring. Thereafter they resemble the adults very closely. In some cases, the first juvenile moult is suppressed, particularly among individuals that have hatched late in the season, as has been recorded for White Wagtails in the Netherlands.

Habitat

Members of this family have radiated out into most available habitats. They occur from the coast and offshore islands, on cliffs and rocks and along the seashore, where the Rock Pipit and the South Georgia Pipit are found, to the tops of high mountains, where the Water Pipit and the Mountain Pipit breed. They range also from the northern tundra, the breeding habitat of the Buff-bellied, Pechora and Red-throated Pipits, to grassland in the subtropics and tropics, the home of the Yellow-breasted, Buffy and Plain-backed Pipits and some of the South American pipits. Northern conifer forests harbour Olive-backed Pipits, and in broadleaf forests there are Forest Wagtails in Asia and Sokoke Pipits in East Africa. In the Afrotropics, rocky hillsides with scattered trees support Striped and Long-billed Pipits, and above 1000 m rocky hills and *kopjes* hold Yellow-tufted Pipits. In open woodland in that continent there are Bush and Woodland Pipits, as well as wintering Tree Pipits, and by rivers, lakes, marshes and other wetlands in the Old World species such as the White-browed, Mekong, African Pied, Yellow and Cape Wagtails are found. Forested mountain streams are inhabited by two specialists, the Grey Wagtail in Eurasia and the Mountain Wagtail in Africa.

Some motacillids exploit suburban developments and urban habitats. White and Japanese Wagtails, for instance, often frequent human settlements and built-up areas, and they and other species flock into towns and cities at dusk to roost on buildings or trees (see General Habits). Parks and gardens often provide ideal foraging habitats for some members of the family. The Cape Wagtail, for example, is one of the most widespread garden birds in southern Africa, where it sometimes becomes tame (see Food and Feeding). Industrial landscapes, such as open-cast coal mines, support a few species, including Meadow and Tawny Pipits.

Despite the wide variety of habitats used by members of the family, at least 70% of all motacillids have a distinct preference for grassland or other open-country environments, such as dunes, heathland and moorland, and both fallow and arable land. All the longclaws and many of the pipits occur on grassland, whether wet or dry and with or without bushes and scattered trees. Grasslands at sea-level support such diverse species as the Malindi Pipit, the South Georgia Pipit and the Pangani Longclaw



The race brasilianus *of* ***Hellmayr's Pipit*** *is a common inhabitant of lowland grassland in Brazil, Uruguay and Argentina. It seems to favour relatively tall grass, as well as rank pastures and agricultural land. In the Andes, the nominate race is usually found in a rather different setting: it thrives in the short-sward grassland of the* puna *zone, and on rocky and shrubby mountainsides with patches of stunted turf. The lowland and Andean forms may, in fact, not be closely related. They are geographically isolated, and the results of recent molecular analysis suggest that a significant genetic gap exists between them.*

[*Anthus hellmayri brasilianus*, Serra da Canastra, Minas Gerais, Brazil. Photo: Edson Endrigo]



A few pipits are almost inextricably associated with trees. The ***Olive-backed Pipit*** *tends to breed at the edge of taiga woodland, and forests of oak, birch, alder and pine. For the winter, it migrates south to tropical climes, where it lives in plantations of mango, cardamum and coffee, and visits various types of semi-open country, as long as trees are available. When disturbed, this species habitually escapes upwards to the safety of a high branch, giving a diagnostic fizzing call-note as it goes. As might be expected, the hind claw of this arboreal pipit is distinctly shorter and more curved than that of its terrestrial relatives.*

[*Anthus hodgsoni*, China. Photo: Göran Ekström]

(*Macronyx aurantiigula*). Montane grassland in Africa is the haunt of the Yellow-breasted Pipit and Sharpe's Longclaw, while the avifauna of the *puna* grasslands of the Andes includes the Short-billed, Correndera and Paramo Pipits. The temperate grasslands of Europe and North America are inhabited by, respectively, the Meadow Pipit and Sprague's Pipit, the ecological counterparts of which in Asia, Australia and New Zealand are Richard's and Paddyfield Pipits and the Australasian Pipit. In South America, the Yellowish, Ochre-breasted, Hellmayr's and Correndera Pipits all occur on grassland, pastures and fields. Some species, such as the Correndera Pipit, tolerate a wide range of altitudes, whereas others are more restricted, at least in the breeding season, to certain altitudinal limits.

Dry, open fields are utilized by many species, especially when on migration. In southern Africa, for example, fallow and arable land is a favoured haunt of Grassveld and Buffy Pipits. Meadow Pipits will nest in such habitats in Europe, and Yellow Wagtails breed in cereal crops and in fields with potatoes and other root crops, albeit at lower densities than they do in their preferred habitat of floodplain grassland. Dry, short grassland is preferred by some *Anthus* species, such as the Buffy and Sprague's Pipits, and moister, taller grassland by others, of which the Red-throated Pipit is an example. On its breeding grounds in southern Canada, Sprague's Pipit shuns non-native vegetation, such as is found in seeded pasture, hayland or cropland, and is almost restricted to native grassland with dead vegetation less than 10 cm high. Non-native pasture has taller vegetation and an increased amount of bare ground, which probably makes it less attractive to this species. Many motacillids avoid more bushy parts of grassland, but grassland with scattered bushes or developing scrub is frequented by species such as the Cape Longclaw and the Golden Pipit in Africa. These birds use the bushes as vantage points or songposts. Even in montane pastures, Water Pipits often employ a tree, bush or rock outcrop as a lookout post.

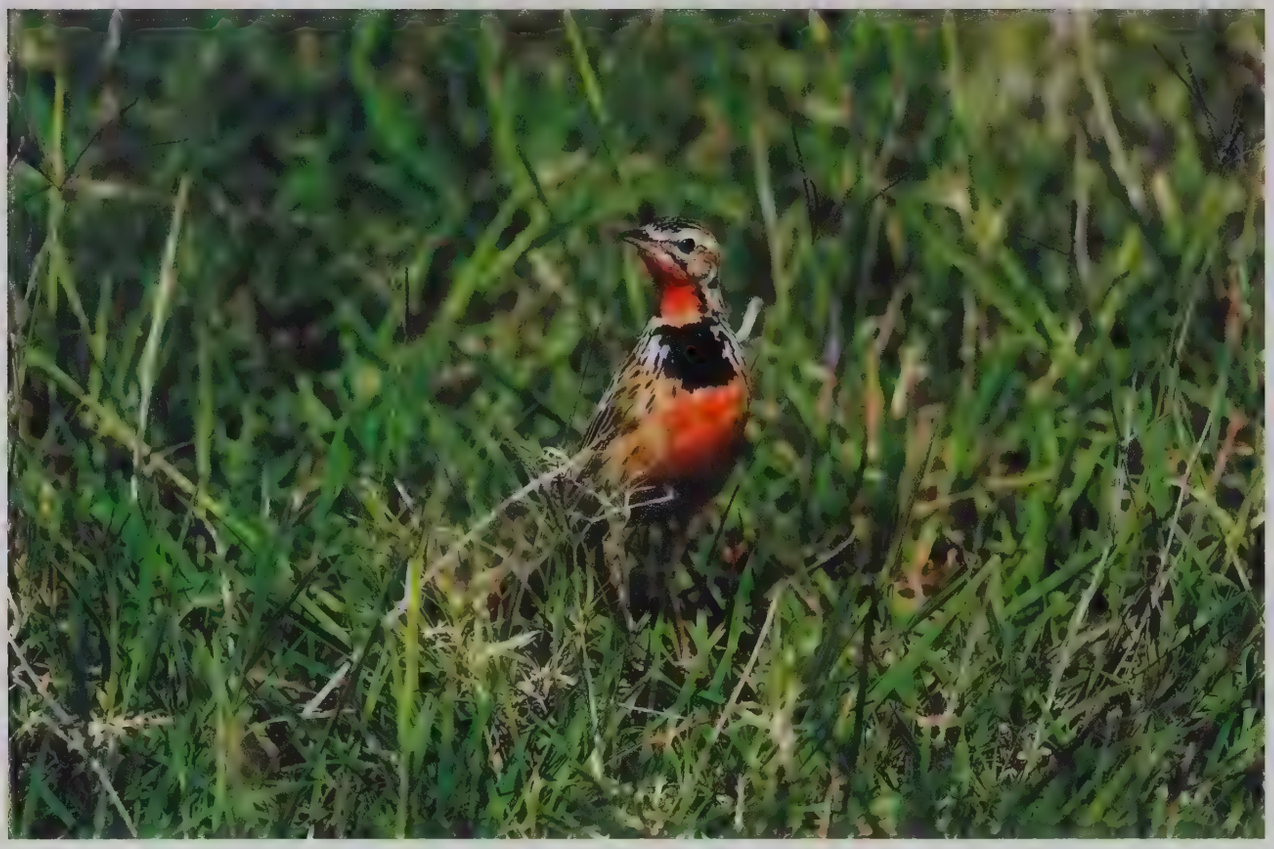
Motacilla wagtails generally prefer wetter grassland than that frequented by pipits. They regularly breed in the floodplains of lowland rivers or along the edges of lakes, streams and rivers, as is typical of the Cape, Yellow and Madagascar Wagtails and the majority of the "black-and-white group" (see Morphological Aspects). Several of the longclaws, notably Fülleborn's and Rosy-breasted Longclaws (*Macronyx ameliae*), also rely on wet or damp grassland, a habitat utilized similarly by Plain-backed Pipits. Willow (*Salix*) mires, sedge (Cyperaceae) marshes and peat bogs attract Red-throated Pipits, and are also common breeding sites for Yellow and Citrine Wagtails in the northern parts of their ranges.

The most specialized of all *Motacilla* species in terms of breeding habitat is the Mekong Wagtail. This recently described species occurs in north-east Cambodia and adjacent parts of Thailand, Laos and Vietnam, where it breeds during the latter part of the low-flow season on the Mekong River and a small numbers of its tributaries. Most records of this species are from rivers more than 100 m wide, and all localities where it has been found are below 100 m in altitude. The Mekong Wagtail requires braided sections of river with swift-flowing water, and with a distinctive mosaic of sandbars and gravel shoals and numerous emergent rocks and bushes, a habitat sometimes referred to as "channel mosaic". Here, it has frequently been observed to forage within the tops of bushes projecting above the water surface. Significantly, it appears to shun exposed areas, such as sandbars and earth banks, as well as higher islands with vegetation resembling that of the adjacent floodplain. Although the wagtail may use exposed areas during the non-breeding season, when water levels are much higher, there are very few records of it for this period of the year.

Forest Wagtails, as already mentioned, are found in broadleaf forests. They breed in a wide variety of such forests, both deciduous and evergreen, and occasionally even in pine (*Pinus*) woodland. This Asian species is migratory, spending the non-breeding season mostly in the south-east of that continent. It is then found in the same types of habitat, but also at the edges of humid forest and in plantations and parkland, and it occasionally roosts in mangroves and reedbeds. Reedbeds are also a common roost-site of Yellow Wagtails during the post-breeding migration.

During the non-breeding season, irrigated areas, especially rice fields, are favoured by a number of motacillids, including Yellow, Citrine, White and Japanese Wagtails, as well as the river-breeding Grey Wagtail. Similarly, farmyards and manure heaps attract various pipits and wagtails, primarily outside the breeding season, as also do sewage pools and settling beds. All of these places, of course, provide a rich source of insect food.

An interesting example of a change in habitat between the breeding and non-breeding periods is provided by the Water Pipit



The genus Macronyx *is endemic to Africa, and wherever its constituent species are found in sympatry they tend to be segregated by habitat. In Kenya, where this photograph was taken, the* ***Rosy-breasted Longclaw*** *is fond of tussocky grassland, preferably in seasonally or permanently flooded areas, and often near swamps, marshes, rivers, lakes, coastal lagoons and other wetlands. This attraction to damp meadows and rushy bogs minimizes overlap and competition with the Yellow-throated Longclaw* (M. croceus), *a species which tends to occupy drier ground, and even bushy areas where grass is thicker and longer.*

[*Macronyx ameliae wintoni*,
Masai Mara National Park, Kenya.
Photo: Günter Ziesler]

in Europe. During the summer, this species nests on alpine slopes and upland plains, generally between 1000 m and 3000 m, in areas with short grass and boulders, and usually near streams or wet patches. After nesting, it moves down into the lowlands and seeks out freshwater areas, including, in particular, flooded meadows and dried-out fish ponds. Some of the central European population migrates north-westwards to Britain, where watercress beds, which depend on a steady flow of pure fresh water, are a likely place for the observer to find this pipit.

Although several species of motacillid may utilize the same habitat, there is usually some partitioning on a finer scale. For example, Water Pipits and Meadow Pipits overlap on mountain pastures in west and central Europe, but Water Pipits favour short grass for foraging, whereas Meadow Pipits forage in longer vegetation. In areas where Citrine and Yellow Wagtails occur together, the former forages in wetter habitats, even wading in water. Similarly, where Richard's Pipit co-occurs with the Tawny Pipit, it prefers more fertile and moister grasslands than its congener, even feeding in marshy meadows alongside Yellow Wagtails. The same partitioning of the habitat can be seen in South America. Short-billed and Correndera Pipits are found together in grassland habitats in the Andes, but the former occurs in more arid country, whereas the Correndera Pipit exploits lusher areas with taller grass. Likewise, the Yellowish Pipit breeds on damp lowlands in Brazil, whereas Hellmayr's Pipit is found on adjacent drier hillsides; these ecological preferences, however, are not obvious outside the breeding season.

Similar examples are evident in Africa, where two or three species of longclaw may live alongside each other, as in parts of Zimbabwe. In such cases, they are usually segregated by finer habitat choices. The Rosy-breasted Longclaw tends to feed in the centre of low-lying areas of wet grassland, or vleis, and the Cape Longclaw on drier, shorter, sparser grassland, whereas the Yellow-throated Longclaw (*Macronyx croceus*) prefers areas where trees and bushes intrude and the grass is thicker and longer. In addition, Yellow-throated Longclaws will use some habitats, such as montane grassland, only in areas where Cape Longclaws are absent. The various subspecies of the Yellow Wagtail also differ slightly in habitat preferences in their wintering areas. Thus, the south-west Asian race *feldegg* often spends the non-breeding season along rivers in Africa, whereas the central European nominate race and the one breeding immediately east of it, *lutea*, prefer grassland in their African winter quarters.

General Habits

Most members of the family are terrestrial, both foraging and nesting on the ground. They take to the air only when flushed or during song and courtship displays, and, of course, when dispersing or on migration. Some species crouch or hide when disturbed, flying only if danger is imminent. Relatively few habitually perch in trees. Among the *Motacilla* wagtails, both the Grey and the Mountain Wagtails, when disturbed, readily fly up to trees along the upland rivers which they frequent. They also use branches as perches from which to launch aerial flycatching sallies out over the river, and they perform display-flights from trees. The aberrant Golden Pipit also frequently perches in trees and bushes, as do Cape Longclaws and Yellow-breasted Pipits, Olive-backed and Tree Pipits, and Woodland, Long-billed, Bush and Striped Pipits. They all fly to trees when disturbed, in addition to which they may sometimes forage in trees, even walking along branches, or use trees as perches during courtship displays. In Africa, termitaria are used by longclaws as vantage points or songposts. The more terrestrial Grassveld, Buffy and Plain-backed Pipits occasionally perch in low trees or bushes in the Afrotropical grasslands, but they usually prefer a termite (Isoptera) mound or a rock as a perch.

A major exception to this general picture is the Forest Wagtail of eastern Asia. Although this species does regularly forage on leaf-covered ground, it is equally likely to seek food in trees. Moreover, it is the only member of the family that habitually nests in trees, sometimes well above the ground, making it a truly arboreal species. Other motacillids are known to build nests in bushes and trees (see Breeding), but none of them does so on a regular basis throughout its range.

Tail-wagging is a characteristic trait of many members of the family. It is, of course, a common, conspicuous and well-known aspect of the behaviour of the wagtails, and the word *Motacilla* itself could be rendered in English as "tail-mover", but many pipits also exhibit tail-wagging when feeding or during displays. Whereas all wagtails of the genus *Motacilla* wag the long tail up

and down, the Forest Wagtail sways the tail and the hind part of the body from side to side in a distinctive, exaggerated motion, normally while perched among the branches of a tree. Despite some early statements that this species, when disturbed, flies up to an overhanging branch, where it sits while wagging its tail slowly up and down and pivoting the hind end from side to side, subsequent observations indicate that the tail is always moved laterally, together with the rear body.

The way in which a pipit moves its tail, and the posture adopted at the time, can be a helpful or important clue to its identification. Some species, such as the Plain-backed and Buffy Pipits, stand very upright, whereas others, among them the Long-tailed Pipit, have a more horizontal stance. Some wag the tail up and down continuously for several minutes at a time, while others raise the hind body and then, slowly and deliberately, depress both it and the tail several times. As an example of these differences in tail-wagging behaviour, the Upland Pipit (*Anthus sylvanus*) flicks its tail quite sharply, in contrast to the Olive-backed Pipit, which gently moves its tail up and down. Generally, the majority of pipits wag the tail rather slowly. The Buff-bellied Pipit bobs its tail up and down or swings it from side to side, nodding its head at the same time. When a Grassveld Pipit is disturbed, it runs, holding the body horizontal, and then pauses, standing erect, before running and pausing again; at each pause, it dips its tail one to three times, but it does not perform the pronounced tail-wagging of, for example, the Tawny Pipit or the Buff-bellied Pipit. The Plain-backed Pipit also gives exaggerated wags of the tail during pauses between walking or running, and the Buffy Pipit, pausing in very upright posture, wags its tail very deliberately as it raises and then lowers the hind part of its body. In contrast, the recently described Long-tailed Pipit moves its tail in the manner of a *Motacilla* wagtail, while adopting a horizontal posture, being rather similar to the Tawny Pipit in this respect. As a final example, Golden Pipits, too, while perched in trees or bushes, wag the tail in typical *Motacilla* fashion.

Although tail-wagging is a widespread trait among the Motacillidae, its function is unclear, and the reasons why wagtails, pipits and some other avian species perform this action may be varied. It has often been suggested that tail-wagging or other body movements made by birds living by fast-flowing water may perhaps render the birds less conspicuous. Tail movements by wagtails and pipits may also serve as signals, for example, to other flock-members, and so help to maintain the unity of foraging flocks. Exaggerated tail-wagging is used as a signal during courtship and other displays, and may serve an important territorial function. Another hypothesis is that tail-wagging is a signal to predators. When a wagtail or pipit lands on the ground, it usually wags its tail immediately. This movement supposedly then attracts any nearby predator, drawing it out of cover while the bird is still alert and able to avoid capture. If no predator is spotted, the motacillid begins to feed; it wags its tail at intervals, in case a predator has arrived nearby. A further hypothesis is that the action may have the effect of disturbing insects. If this is so, tail-wagging could be expected to increase when the bird is foraging in shade, in order to compensate for the poorer visibility caused by reduction in contrasts between dark and light colours. Indeed, this is what happens in the case of an unrelated Australian species, a fantail known as the Willie-wagtail (*Rhipidura leucophrys*); observations demonstrated that individuals of this species, when foraging in the shade, wagged the tail at more than twice the rate of those foraging in the sun. Yet another possibility is suggested by observations of a coastal motacillid in north-west Europe. Rock Pipits, when foraging along the shore, wag the tail seemingly as an intention movement, as when they are about to lunge at a fly.

Some motacillids are resident or make only short-distance movements after breeding. This is particularly so in the case of the two species confined to Atlantic islands, the South Georgia and Berthelot's Pipits, but some others, such as the Afrotropical longclaws and Yellow-breasted Pipit, are also sedentary. All of these species occur in pairs or in small family groups. Many members of the family, however, are partially or entirely migratory, and these often gather into flocks, sometimes large ones, outside the breeding season. They also congregate to roost when on migration or in the non-breeding quarters. At these times, thousands or even tens of thousands of wagtails may assemble at dusk. In Nigeria, for example, 20,000-50,000 Yellow Wagtails were recorded at a winter roost. Other species, including White, Citrine, African Pied, Cape and Forest Wagtails, likewise roost together in large numbers. Grey Wagtail roosts, on the other hand, tend to be small, consisting of fewer than 50 individuals, but larger ones



*Not only does the **Yellow-throated Longclaw** prefer dry grassland away from water, but it is also attracted to recently burnt areas. Shortly after a blaze swept through, this young bird arrived to harvest easy pickings. With the sward burnt down, items such as charred insects and seeds become readily visible, where once they were well concealed, and a variety of open-country birds converge to take advantage of the feast.*

[*Macronyx croceus croceus*, Masai Mara National Park, Kenya. Photo: Morten Strange]





Although some pipits or longclaws are often seen around the margins of grassy wetlands, none have such aquatic lifestyles as the wagtails. The most famous riverine species are the Grey Wagtail (Motacilla cinerea) *of Eurasia and the Mountain Wagtail* (M. clara) *of the African highlands, but many species, perhaps a majority, have a tendency to use river-edge or wetland-edge habitats at least some of the time. The* ***Japanese Wagtail****, for example, is most often found at riversides and lakesides, or near ponds, aquaculture and rice fields. However, this beautiful species, virtually endemic to Japan, is by no means as tied to fresh water as first impressions might suggest. It happily feeds in parkland and pastures far from water, and it frequents the hinterland of sea coasts in winter. The* ***Madagascar Wagtail*** *adopts a similar lifestyle. It spends most of its time in open areas near water, be it fresh, brackish or salty. It is the only motacillid in Madagascar, however, and its niche is relatively broad, allowing it to feed around settlements and in a variety of cleared areas away from water. Wagtails that habitually feed on streams tend to have longer tails than non-aquatic wagtails. It seems likely that the long tail is an adaptation for maintaining balance on rocks, especially when darting the head out for insects: wagtails with shorter tails tend to overbalance when they attempt this technique! Long tails are also related to aerial foraging as they improve manoeuvrability.*

[Above:
Motacilla grandis,
Nisikawa, north central
Honshu, Japan.
Photo: Hirozo Maki.

Below:
Motacilla flaviventris,
Madagascar.
Photo: Roland Seitre]



*The **Citrine Wagtail** is very closely tied to the edge of wetlands in some portions of its range. In Nepal, for example, this species conspicuously adopts the waterside niche while the closely related Yellow Wagtail* (Motacilla flava) *lives in drier and grassier environments. In all regions, Citrine Wagtails often forage around wetlands, picking insect prey from the water's surface, or darting out over the water to snatch flying insects. They are also regularly seen walking on mats of floating vegetation or even wading in shallow water.*

[*Motacilla citreola*, India. Photo: Gertrud & Helmut Denzau]

are occasionally formed, as shown by reports of hundreds roosting under a bridge in west Europe and up to 200 roosting in Poland, while up to 100 were counted at a roost on the Yemen coast in January. All these wagtail species have much in common in their roosting behaviour and choice of roost-sites.

Different species of wagtail frequently roost together. In Asia, for instance, mixed roosts containing Forest, Yellow, Citrine and White Wagtails occur. Sometimes, pipits and other passerines may join the wagtails. In central England, ten Water Pipits and 13 Meadow Pipits were observed at a White Wagtail roost which was also attended by Reed Buntings (*Emberiza schoeniclus*). Red-throated Pipits, which often associate on wet ground with Yellow Wagtails, will also roost communally with them. A particularly interesting observation was made in western Poland, where an August roost on the floodplain of the River Oder contained, at times, over 2000 Yellow Wagtails, nearly 2800 Eurasian Linnets (*Carduelis cannabina*), 200 Grey Wagtails, five Meadow Pipits and a wide range of other species, including Blue Tits (*Parus caeruleus*), Eurasian Goldfinches (*Carduelis carduelis*) and Reed Buntings.

Grey Wagtails frequently spend the night with other members of the family. In the UK, during the winter months, small numbers have been found in White Wagtail roosts at several sites, including a sand quarry. In this region, the White Wagtails, which numbered 125 to 340 individuals, are of the local British and Irish subspecies *yarrellii*, commonly known as the "Pied Wagtail". Elsewhere, the large coastal Grey Wagtail roost in North Yemen, mentioned a couple of paragraphs above, was associated with a gathering of 225-300 White Wagtails. Similarly, Grey Wagtails in India also assembled at sunset to join other wagtail species for roosting. During the winter of 1942/43, in the Lebanese capital of Beirut, some 20-25 Grey Wagtails arrived each night with sparrows (*Passer*), although the two species roosted separately.

Researchers in the UK found that, during the winter months, most *yarrellii* White Wagtails attending a roost in Berkshire foraged by day in areas within 12 km of the roosting site. There was some interchange of individuals between roost-sites within 10 km of each other. In a study of a Yellow Wagtail roost on the Jos Plateau, in Nigeria, individuals that had been caught and colour-marked at the roost were observed over 13 km away from it during the day, but some flew in to the roost in the evening from sites 32 km away. The catchment area for another very large roost of Yellow Wagtails in Nigeria was estimated to be 270 km^2 in November, increasing to 825 km^2 in February. In Germany, Grey Wagtails were found to spend the day within 2-3 km of their roosting sites.

Pre-roost gatherings and aerial displays are a commonly recorded characteristic of White Wagtails. At the well-studied Berkshire roost, just mentioned, such gatherings took place in the open, where the wagtails could readily be seen from the air. The birds started to collect together in their feeding areas an hour or more before sunset, when they preened and fed sporadically, and made short flights; when they left and headed off towards the roost-site, they made characteristic calls. They then gathered in an area near the roosting site, where they stood about, frequently preening, for up to an hour. These pre-roost gathering areas are used from year to year, and are more constant in location than is the roost itself. Similar events have been observed in many other parts of this species' range. Near a roost-site in Switzerland, for example, White Wagtails used the flat roof of a shopping centre as a pre-roost gathering area, before flying to different roosts in trees, mainly conifers. In Egypt, wintering White Wagtails headed towards the roost in small flocks and collected on open ground, before flying to roost in sugar cane (*Saccharum officinarum*). They would circle around and over the roost, calling, before dropping like stones into the tall cane, at first in ones and twos and then in larger numbers. The overhead circling followed by the sudden dive into the roost perhaps serves to confuse aerial predators, which often attend large roosts of this and various other avian species.

Similar pre-roost gathering sites appear not to be a regular feature for other wagtail species. In southern Africa, Cape Wagtails fly in to the roost at dusk in ones and twos or in small groups of ten or so, approaching from all directions; they circle overhead and call, before diving, directly or on a zigzagging path, down into the reeds or trees. Small groups do sometimes collect up into larger parties of 25 or more individuals at nearby sites, and they then fly in to the roost together. Separate flocks of 20 or more Yellow Wagtails have also been observed to come in just before dusk, circling around and dropping down into dense vegetation to roost; late arrivals dropped straight in, without circling.



*The **White Wagtail** uses an enormous variety of habitats, both natural and man-made, and it is found across a vast geographical range. Although it often occurs alongside water, it is liable to be encountered in almost any category of grassland and open country. Its great mobility and adaptability allow it to penetrate, at least occasionally, into the centre of large cities. It happily hunts on tiny scraps of suitable habitat, such as factory carparks, lawns, and the roofs of office blocks. It is highly territorial in summer, and even in winter large numbers of individuals defend patches of ideal habitat, such as a stretch of lowland stream. Other individuals forego a territory and roam the countryside, sneaking into patches defended by others. Most birds forage alone. Whether they are territorial or non-territorial, many non-breeding individuals congregate at night in communal roosts, a characteristic feature of wagtail ecology. These roosts appear in a variety of situations, but one favourite habitat is extensive reedbeds, upon which hundreds, and sometimes thousands, of wagtails converge. Individuals, pairs or small groups usually approach with bounding flight from all points of the compass, call loudly a couple of times, then plummet headlong into the reeds. In the daytime, White Wagtails leave the reedbed to feed in open situations. This individual, so picturesquely captured in a stand of* Phragmites, *has just been disturbed from the shores of a pool and has taken refuge on a handy perch.*

[*Motacilla alba alba*, Hortobágy National Park, Hungary.
Photo: Günter Ziesler]

J. B. Wood found that Yellow Wagtails wintering in Nigeria flew en masse to the roosting site, where they circled and then dived steeply into the vegetation; at dawn, they left the site in waves. At this site, the wagtails that held daytime feeding territories joined the communal roost later and left earlier than did non-territorial flock-feeders.

Roosts can contain the same individuals for several weeks or months during the non-breeding season. At other times, however, there can be a high turnover of attendees, presumably as passage migrants stop for a day or two and then migrate farther. At the Berkshire White Wagtail roost, winter visitors and passage migrants arrived at the end of September, with the main passage occurring during October. Wintering numbers reached a peak in December and early January, and by late March and early April many birds had left. Locally breeding wagtails used the roost during the summer, even during the nesting season.

Wagtails and pipits roost in tall aquatic vegetation, such as reeds (*Phragmites*) and sedges, including papyrus (*Cyperus papyrus*), or in trees or sometimes in or on buildings. Both Water and Red-throated Pipits favour reeds, sedges, bulrushes (*Typha*) and grass, as do Yellow and Cape Wagtails. The last two species will also roost in sugar cane, as well as in trees and shrubs such as palms (Arecaceae), figs (*Ficus*), gums (*Eucalyptus*), pines, planes (*Platanus*), and mangroves growing in shallow water. Grey Wagtails prefer bushes or trees overhanging water, but sometimes sleep in sugar cane or reeds, or away from water in trees or on buildings; individuals may roost singly in crevices in stonework, such as under bridges. In Asia, Citrine and Forest Wagtails commonly roost in sugar cane, reeds or mangroves. Urban areas, being generally warmer during the night-time than are more open areas of countryside, not infrequently attract motacillids for roosting. White, African Pied and Cape Wagtails often roost in trees in town and city centres, as well as on or in buildings such as factories and greenhouses, and under bridges. The African Pied Wagtail has been recorded as roosting on yachts in Uganda and on small boats in Kenya.

Any site selected for the purpose of roosting is often used in successive winters over many years. In Nigeria, however, Wood found that Yellow Wagtails frequently changed their roost-sites, attributing this to the probability that predators had learnt to exploit a regular roost.

The practice of communal roosting has been thought to offer the birds additional protection from predation or, alternatively, to serve as an "information centre" whereby the individuals present can learn of the whereabouts of good food sources. P. Ward and A. Zahavi, in 1973, suggested that mixed-species roosts might occur where good roosting sites were limited or where one species benefited in some way, other than by gaining knowledge about food supplies from the other species. They argued that individual species within mixed roosts could still use these as "information centres", enabling them to gain knowledge about the location of food. They also contended that, when roost-members are apparently able to find adequate food with no difficulty, the roost should be seen as a form of "insurance" against the risk of losing a hitherto good feeding area. Autumn roosts of migrating wagtails and pipits may be of some benefit to newly arrived individuals, by providing them with the opportunity to feed with birds that have been in the vicinity for longer and that know where to find food locally. They may also enable dispersed motacillids to join up with others for the onward flight.

By roosting together, birds may be better protected from predators. This is because, with a large number of birds all in one place, one or more individuals will be alert at any given time and, if alarmed, their calls are likely to alert the others, at least those close by. For wagtails, communal roosting is certainly likely to confer an advantage on dominant birds, those in the middle of the roost. These will be better protected from predators.

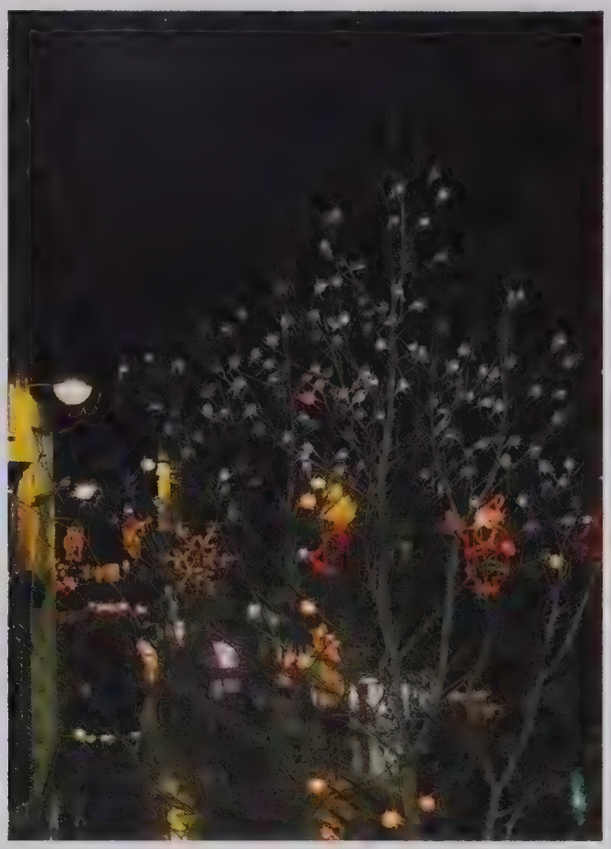
Y. Yom-Tov recorded an interesting disadvantage of being perched in a low position in a communal roost. Individuals on lower perches may have their plumage damaged by droppings from those above. Experimentally, he tested the effect of droppings on the plumage of captive Common Starlings (*Sturnus vulgaris*) and found that the uric acid reduced the water repellency of the feathers, thereby rendering the birds more vulnerable to wetting and chilling.

Heat conservation may be a further advantage of communal roosting. Preferred roost-sites provide good shelter, thus minimizing energy loss. Moreover, dominant individuals in the mid-



*The **Mountain Wagtail** is a crisply patterned species so strictly tied to freshwater waterways that it can be classed as a habitat specialist. It likes exposed rocks and gushing water, regardless of altitude, and it is hardly ever seen away from the banks of fast-flowing streams and rivers in forested areas, although it does sometimes venture into more open habitats if its competitor, the African Pied Wagtail* (Motacilla aguimp), *is absent. When disturbed, the Mountain Wagtail usually flicks a short way along its chosen stream, calling loudly, until it alights on the branch of a tree, wagging its tail in classic wagtail fashion.*

[*Motacilla clara torrentium*, Mt Kenya, Kenya. Photo: Marc Guyt/AGAMI]



dle of a roost could be warmer than those younger or more subordinate birds at the edge. Wagtails perch apart from their neighbours, rather than huddling together as do Common Wrens (*Troglodytes troglodytes*). At a roost containing 200 White Wagtails of the subspecies *yarrellii*, the median inter-neighbour distance was found to be 17 cm, with a minimum distance of 7 cm. This did not change, whatever the weather, and these distances remained the same when the size of the roost changed. It is probable, therefore, that the wagtails gained no benefit from any increase in temperature that could result from huddling within the roost. Wagtails that roost within factories or greenhouses and on buildings in towns and cities will benefit, as the ambient temperature at all these sites, as mentioned above, is warmer than that found in and around trees or bushes out in the country.

Possibly, the roost also fulfils some social need through allowing interactions between individuals of a species. If the weather turns severe, information gained in the roost may prompt birds to fly farther south, and the roost itself will facilitate the formation of migratory flocks. An element of learning, of behaviour, calls or song, may also be involved. In addition, the roost may also have an important function in the process of mate selection in the late winter.

Maintenance of the plumage and comfort behaviour are fairly routine activities among the Motacillidae. Preening is undertaken frequently, and head-scratching is by the indirect method, with the leg brought up and over the wing. Bathing is carried out in shallow water. Sun-bathing is not well documented for the family, but it has been observed occasionally. Grey Wagtails are described as sunning by adopting a crouched posture on rocks or pebbles, and then spreading the wings, cocking the head backwards and slightly raising the tail. Some of the *Anthus* pipits are known to perform anting, by applying the insects directly to the plumage.

Although small-scale communal roosting is found throughout the family, the only motacillids known to form large roosts are members of the ***White Wagtail*** *complex. The British form, known as the "Pied Wagtail", seems particularly fond of roosting in city centres, either in trees or around rooftops. Individuals, sometimes of more than one species, often converge from farmland sites many miles away to reap the benefits of roosting together. The specific nature of these benefits is difficult to be sure of, but it is likely that some combination of favourable microclimate, predator avoidance, and information transfer can explain the phenomenon.*

[*Motacilla alba yarrellii*, Norfolk, England. Photo: Chris Knights/Ardea]

Voice

Although the motacillids are not great songsters, there is considerable variety in their voices. Indeed, in the case of the pipits, the calls or songs, or both, are very often important aids in identification of species. Motacillids often call when they take off or are flushed. They also give contact and alarm calls.

Calls are simple monosyllabic or disyllabic notes, or occasionally trisyllabic utterances. Typically, the take-off and flight calls are variations of sounds that can be transliterated as "teez", "chip", "tsit", "tsip", "phisst", "tseet", "twee", "dweet" or "wheet". The quality of this note is variable. That emitted by Blyth's Pipit (*Anthus godlewskii*) and the Cape Longclaw is harsh, that of the Olive-backed Pipit is hoarse, the call given by Short-





Pipits are not noted to be aggressive birds but disputes do arise over territory boundaries. These photographs seem to capture a disagreement between one ***Hellmayr's Pipit*** *and another regarding the ownership of a coveted fence post. It is common for pipits to sing strongly at one another, or to embark on prolonged song-flight duels, but it is rare for them to come to blows. Most conflicts are resolved by posturing and vocalizing, and when fights do escalate they usually involve little more than a momentary aerial grappling.*

[*Anthus hellmayri dabbenei*, Laguna Rocha, Riviera, Uruguay. Photos: Johannes Ferdinand]



For all their beauty and popularity, wagtails are pugnacious creatures. Contests between adult males can be violent affairs. The most volatile and combative members of the family belong in the Motacilla alba *complex, including the* ***White-browed Wagtail****. Non-breeding individuals battle over foraging patches, and in the breeding season their testosterone level rockets up. They become infuriated by the merest glimpse of their own reflection; they spend minutes on end attacking window panes, shiny hubcaps and mirrors; and when they encounter a real intruder, they are soon wrestling heedlessly on the ground.*

[*Motacilla maderaspatensis*, India. Photo: David Tipling/ Windrush]

tailed and Bush Pipits is nasal, and that of the Forest Wagtail is metallic. The Meadow Pipits's call is soft and thin, whereas the Sokoke Pipit's is loud and high-pitched. The note can be sharp and often explosive, as demonstrated by the Rock, Grassveld and Long-billed Pipits and the Cape Wagtail, or it can be drawn out into a "chrzeep" or "dzeep" sound or, as with the Yellow and Citrine Wagtails and the Red-throated Pipit, be extended into an almost disyllabic "pseeeow" or "pseeeeeu".

Sometimes, the call note is repeated two or three times. The Cape Wagtail, for example, calls "tsee tsee", the Bush Pipit utters a nasal "tseep tseep tsseep", and the Meadow and Rosy Pipits give a thin, squeaky "tsip tsip tsip". Likewise, many wagtails have disyllabic take-off and flight calls, likened to "chizzik", "tschizzick" or "zittick". This can be harsh, as with the White Wagtail, or shrill and loud, as with the African Pied Wagtail's "tu-weee", or metallic and high-pitched, as with the Grey Wagtail. In the Afrotropics, some of the *Macronyx* and *Hemimacronyx* species utter a softer or whistle-like disyllabic call, as typified by the rich rising "youee" or the descending "eeoo" of Sharpe's Longclaw. Alarm notes of motacillids tend to be shrill and loud, but are sometimes softer. The White Wagtail, for instance, utters a harsh "chick" when alarmed, whereas some longclaws give a cat-like "meeow" and the Rosy Pipit a mournful squeak. Several species make sparrow-like chirps when alarmed. These are similar to the "chirrup" calls uttered from the age of five or six days by the nestlings of some motacillids.

For any species, of course, these short vocalizations vary, often according to the individual's activity and the degree of alarm. For example, the monosyllabic "chip" of the Buffy Pipit is sometimes extended into a disyllabic "chipip" or a trisyllabic "chipipip". Tawny Pipits utter a loud "tseeu" call on take-off, a "tseep" in flight and a shrill "sree" when alarmed, as well as a high-pitched "tji tji tji". The common call of the Yellow-breasted Pipit is a whistled "tseeu", but this species utters a rapid and continuous "chick chick chick" when alarmed. In the latter situation, the Yellow-throated Longclaw makes a loud piping "twip pipipipipipipi", the "pi" note being repeated up to nine or so times. Motacillids emit soft contact calls when on the ground or perched, but the vocalizations become louder on take-off, or shrill and repeated when the individual is in a state of high alert. The Mountain Pipit, for example, has a soft "tuchit tuchit" when perched, a louder "chiri" or "psiu" flight call and a "twit twit twit" alarm call.

Additional sounds are occasionally made. At well-studied roosts of *yarrellii* White Wagtails in the UK, low-level crackling noises have been reported. These have been likened to the sound made by the crumpling of a piece of cellophane, and are apparently produced by soft clicking of the mandibles. The sounds are thought to be made by individuals defending sheltered positions within the roost.

The songs of the members of this family are generally simple and often rather monotonous. The song of the Buffy Pipit has been described as a dry and monotonous series of notes, and that of the Yellow Wagtail as a prolonged high-pitched twittering. On the other hand, the Cape Wagtail's song has struck some listeners as being melodious and not unlike that of a canary (*Serinus*), and that of the Paramo Pipit as having a thrush-like quality.

Rather typical of the family are songs consisting of a repeated series of call-like notes. In the case of the Long-billed Pipit, these are delivered in a random and disjointed sequence, whereas the Grassveld Pipit repeats phrases of three to five notes every few seconds. The song of Sharpe's Longclaw is a thin series of whistles, rising in pitch, or repeated "sip" notes, while the loud melodious song of the Striped Pipit is a sequence of whistled phrases, each lasting 2-5 seconds, with a 1-second pause between them. The sweet-sounding song of the Yellow-tufted Pipit is a repetition of disyllabic notes, "whee-tsreeee", the second note trilled. Various motacillid songs end with a wheeze, as that of the Rosy-breasted Longclaw, or with a trill usually falling in pitch, as in the case of the Grey Wagtail and the Meadow Pipit.

The Upland Pipit has a song that is strikingly different from those of its congeners. It consists of two notes, "seetyu seetyu" or "tyusee-tyusee", repeated several times, and is reminiscent of that of a Great Tit (*Parus major*) but slower and less brisk. This species also sings a long-drawn monotonous, whistling "wichee wichee wichee", the notes being repeated up to 15 times; it has been likened to the sound of a saw being sharpened. In contrast, the song of the Olive-backed Pipit has been likened to that of a Common Wren, while that of the nominate race of the Pechora Pipit consists of buzzing lark-like trills or trills resembling those made by a Wood Warbler (*Phylloscopus sibilatrix*).



Sunning behaviour in motacillids has received paltry coverage in the ornithological literature, but this does not mean it is an uncommon event. This ***White Wagtail*** *has been captured in classic sunning posture, and it is likely that all members of the family strike this pose when suitable conditions arise. Sunning is thought to play a role in maintaining feather quality and controlling parasite load. It usually takes place when a bird, induced by the warmth of a sheltered spot, spreads its wings and tail, raises the feathering on its abdomen, and tilts its head away from the sun. As a result, direct sunlight penetrates the largest possible surface area of plumage.*

[*Motacilla alba alba*, Sohar, Oman. Photo: Hanne & Jens Eriksen]

The two other races of this pipit, *menzbieri* and *stejnegeri*, have a weird mechanically whirring, buzzing song, in the case of the latter sometimes likened to the dry rasping jingle of an *Emberiza* bunting or even recalling the drumming of a Common Snipe (*Gallinago gallinago*).

Wagtails and pipits deliver their songs from a perch, such as a fence post, termite mound, rock or tree, or high in the air, or during the descent stage of an aerial display (see Breeding). The Rosy Pipit's song comprises a twittering phrase while the bird is rising into the sky, followed by long series of pleasant "tsuli-tsuli-tsuli" notes as it descends on outstretched quivering wings, these fading as it nears the ground. Above the prairies of North America, Sprague's Pipit sings incessantly while high in the air, its song being variously interpreted as a sweet, thin jingling series, descending in pitch, of repeated "ching-a-ring" or a descending series of musical "tzee" or "tzee-a" notes. In Africa, where the Grassveld Pipit sings in a circular display flight, the related Paddyfield Pipit ascends with a sparrow-like "chirrup", and then gives a disyllabic "diee" series as it hovers, before making a silent descent. It then rises once more. In the grasslands of the Neotropics, the Yellowish Pipit utters short "tsit" calls as it climbs, but pours forth a long slurred song as it glides down. As a final example, the Madagascar Wagtail's melodious song, a trisyllabic, slightly trilled "tree treeoo", usually repeated several times and followed by a melodic phrase, is delivered from the ground, from a raised perch or in flight.

There is some evidence that mimicry is incorporated into motacillid song. T. Farkas found that some longclaws, when alarmed, imitated other birds. Furthermore, C. J. Vernon believed that the songs of the Striped Pipit and the African Pied Wagtail were sufficiently complex to suggest that they may sometimes include imitations.

Food and Feeding

All members of the Motacillidae family feed largely on small invertebrates. The sharp and wide but long and pointed bill of the pipits, longclaws and wagtails is perfectly adapted for picking prey from soft sand or mud, among rocks and pebbles or in short vegetation. A huge array of invertebrates is eaten. Insects predominate in the diet, but a wide variety of other arthropods, ranging from spiders and other arachnids to myriapods, worms, small terrestrial, freshwater or marine molluscs and crustaceans are also consumed. Among insect prey, various fly (Diptera) larvae and adults, small beetles (Coleoptera), crickets and grasshoppers (Orthoptera) and larval and adult moths and butterflies (Lepidoptera) are especially important. Among other important insect prey are hemipterans, including both true bugs (Heteroptera) and cicadas and aphids (Homoptera), mantids (Mantodea), termites, especially winged ones, and ants (Hymenoptera), while aquatic insects, such as mayflies (Ephemeroptera), feature prominently in the diet of riverine species. Larger invertebrates, such as crabs, are sometimes caught, and vertebrate prey occasionally taken include amphibian tadpoles, lizards and fish. Seeds and other vegetable material are eaten by many species, but they form only a small part of the diet. Grit is also ingested, as an aid to digestion.

For many motacillids, there is still rather little information available on the diet other than the fact that small insects and other invertebrates are eaten. The South American species have been little studied, and virtually nothing is known of the diet of some African species such as the Long-legged (*Anthus pallidiventris*), Long-tailed and Mountain Pipits. Relevant observations on Madagascar Wagtails are also few. In contrast, the diets of some motacillids, notably the White, Yellow and Grey Wagtails, have been studied in great detail.

Direct observations of birds actively feeding, or carrying food to a nest, have provided some data on prey species taken, but in most cases these involve mainly larger and, therefore, readily identifiable items. Otherwise, there are three methods for carrying out quantitative analyses of avian diets. The first involves the collecting of a large sample of individual birds and analysing the stomach contents, but this method, because of the potential conservation implications, has become much less acceptable among ornithologists in recent decades. Examination of faeces and the identification of any chitinous material, such as mouthparts, head capsules, leg fragments and wings or wingcases, is a useful second method. Both adult faeces and the faecal sacs of young can be collected for such analysis, and this method does not have any adverse impact on the birds. The third method involves the use of neck collars or ligatures, which are placed around the neck of nestling birds in order to prevent them from swallowing food; the prey can then be collected from the nestlings and analysed. Provided that the collars are used carefully, and for a limited amount of time, this practice poses little danger to the young.

Stomach and faecal analyses are useful techniques for identifying and quantifying prey, but they do not detect such quickly digested items as flies and homopteran bugs or other soft-bodied wingless invertebrates and can, therefore, misrepresent the proportional importance of some prey. If the bird remove the insect's wings, as has been reported for wagtails taking gadflies (Tabanidae), dragonflies and damselflies (Odonata) and butterflies, these insects may then be under-represented in faecal analysis. Careful application of neck collars can be a means of showing exactly what prey are fed to the young. Whatever the method employed, samples must be collected over a sufficient time period to identify the full range of prey and any seasonal changes in the diet. Limited samples can present an erroneous picture.

Analyses of stomach contents have been undertaken for many motacillids, but the samples generally have been rather few, and from limited locations and seasons. Most stomachs contain a wide diversity of prey items. Neck-collar studies, which have also been widely carried out, have demonstrated, for example, that adult Diptera formed 70% of the food items brought to Meadow Pipits nestlings in a study area in England, a further 19% of items being insect larvae. Similarly, in an urban study area in Japan, this method revealed that both White and Japanese Wagtails also fed largely on dipterans: flies, especially craneflies (Tipulidae), formed 85% and 88% of the prey fed to chicks of the two respective species. Spiders accounted for much of the remaining prey identified, although Japanese Wagtails took some mole-crickets (*Gryllotalpa*), which were significant in terms of weight. Away from urban areas, along rivers, mayflies and stoneflies (Plecoptera) were shown to be more important than flies as food for Japanese Wagtails.

The importance of flies and aquatic insects in the nestling diet of Grey Wagtails has been demonstrated by several neck-collar studies. In one such study, carried out by V. D. Sonin and N. F. Anuchina at Lake Baikal, in north-central Asia, the adults fed the nestlings with a range of invertebrate prey, but over 54% of items were, in order of abundance, mayflies, stoneflies, dipteran flies and caddis flies (Trichoptera). Far to the west, in the Tien Shan Mountains, A. F. Kovshar' found that mayflies, stoneflies and caddis flies dominated the diet of nestlings in late June and early July, making up 85% of food items, but they represented only 5·4% in late July, when dipteran flies were most important, accounting for 32·8%. In the Czech Republic, S. Bureš and M. Kral noted that 90% of 944 prey items fed to nestling Grey Wagtails were flies, mayflies, stoneflies and beetles, in equal numbers, with caddis flies and homopterans each comprising just over 3%; almost 69% of all prey items were adult insects. In a second study in the same country, undertaken a few years later by Bureš, a sample of 496 prey items comprised 36% dipterans, 26% stoneflies, 13·5% homopterans and 8·5% caddis flies, with larvae of aquatic insects representing less than 7% of the nestling diet; aquatic larvae were more important earlier in the breeding season, when there were more large larvae in the river, but these disappeared as the season progressed and as adults emerged. In a Swiss study of the chick-feeding rate of Grey Wagtails, L. von Schifferli found that dipterans were the most important prey numerically, at 43% of items, with stoneflies, mayflies and caddis flies also featuring highly in the diet. These insects were all of aquatic origin, but larvae and adults of a variety of terrestrial insects, as well as a few spiders, were also eaten.

In 1985, both faecal analysis and neck collars were employed by S. J. Ormerod and S. J. Tyler, in Wales, in an attempt to determine the relative importance of different prey for adult and young Grey Wagtails in the breeding season. Diets of adults and nestlings were found to be similar, with adult flies the commonest items. These included small bristly flies (Empididae), hoverflies (Syrphidae), winter gnats (Trichoceridae), shore-flies (Ephyridae), craneflies and non-biting midges (Chironomidae). Adults and young consumed very similar proportions of aquatic prey, in each case representing a quarter of the diet, although nestlings ate more caddis larvae and adults more mayfly nymphs. The importance of the aquatic prey, however, is underestimated when assessed in terms of the numbers, rather than the size and weight, of prey items. Caddis larvae and stonefly and mayfly nymphs tend to be larger items than chironomids or other flies. Further studies were undertaken in Wales in 1986 and 1987, at both acidic streams, where aquatic insects, notably mayflies, are reduced, and non-acidic streams in broadleaf woodland, coniferous woodland and moorland. Again, the numerical importance of flies in the diet of both adult and nestling Grey Wagtails was demonstrated. Adult flies contributed 55-64% of items taken by adults and 23-49% of those fed to the young. Nineteen fly families were identified, all having larvae that live in wet, decaying vegetation or in moor-



The preen gland, also known as the uropygial gland, is located at the base of the tail. It produces an exudate of oil, which birds use to maintain their plumage. The gathering of this oil with the bill during preening is a routine procedure found in all birds, demonstrated expertly by this ***Yellow Wagtail****. The importance of this behaviour is self-evident: frequent waterproofing allows plumage to resist heavy rainfall and the occasional accidental drenching. It is perhaps especially important in birds like wagtails, which are not averse to getting wet.*

[*Motacilla flava flava*, Ma'agan Mikhael, Israel. Photo: David M. Cottridge/ Windrush]





Like most other passerines, pipits and wagtails frequently bathe. They dunk their bellies in shallow pools and flutter their wings so that water droplets splash over the body. There is little doubt that the policy of regular bathing pursued by this ***Red-throated Pipit*** *and* ***Yellow Wagtail*** *owes much to the requirement for clean and functional plumage, but it is also possible that bathing functions in thermoregulation. Most motacillids spend their entire lives in the full glare of the sun, away from shade and shelter, and this must mean that they get very hot, at least in tropical or subtropical climes. Presumably, plunging the plumage into cool water must produce the twin benefits of immediate dousing and subsequent evaporation, both of which must lead to a welcome reduction in core temperature.*

[Top: *Anthus cervinus*, Lesbos, Greece. Photo: Richard Brooks/ FLPA

Bottom: *Motacilla flava flava*, Al Ansab, Oman. Photo: Hanne & Jens Eriksen/Nature Picture Library]

land soils. Some differences were apparent between the diets of the two age-classes and between sites in different habitats. The most marked finding was that, at sites in broadleaf woodland, moth caterpillars were frequent in the diet of adults, in which they formed 18% of items by number, but particularly abundant in that of nestlings, in which they made up almost half of all items recorded. At these sites, flies were correspondingly of less importance. In all habitats, spiders were more important in the diet of nestlings than in that of adults. Aquatic prey made a smaller contribution to the adult diet on acidic streams than they did on non-acidic streams. This was due mainly to the greater exploitation of mayflies on non-acidic streams.

The importance of bankside land use was clearly demonstrated during this study. Using a sweep net to catch insects in the riparian zone, the researchers found that prey availability on upland streams was greater where broadleaf woodland bordered the banks than in places where banks were bordered by conifers or moorland. In the same study, water traps also revealed that insects were more numerous along streams bordered by broadleaf trees than on those with conifers, although in this case insect numbers on moorland streams were also high.

C. Marti and C. Breitenmoser-Würsten carried out a dietary study of Grey Wagtails in Switzerland during the breeding season, and their results proved very similar to those of the earlier Swiss study, as well as those found in the Welsh study and in the second of the Czech studies. Flies and stoneflies were universally important, making up 40-50% and 10-20%, respectively, of food items in all studies except that in the Czech Republic, where fewer flies were taken. Mayflies were especially important for nestlings in Switzerland and the Czech Republic, as were caddis larvae in Wales.

One researcher in eastern Europe found that, although the young and the adults had similar diets, that of young birds was initially dominated by soft-skinned larvae of mayflies, stoneflies and caddis flies, and diptera. It gradually progressed to invertebrates with harder chitinous exoskeletons or wings. This bears comparison with the dietary habits of the Tree Pipit. Adult Tree Pipits feed largely on beetles, but they feed fewer beetles to the chicks, instead providing the latter with more grasshoppers, flies, caterpillars and spiders.

Results from a brief dietary study, using faecal analysis, of Mountain Wagtails and wintering Grey Wagtails on rivers in Ethiopia showed that both species preyed mainly on aquatic insects, especially flies of the families Chironomidae and Empididae. Adult flies of these two families constituted, numerically, 53% of prey items taken by Mountain Wagtails and 33% of items taken by Grey Wagtails. Mayfly adults and, especially, nymphs were important to both species, accounting for 26·5% of the former's diet and 34·9% of the latter's. Lepidoptera and beetle adults and larvae made up 11% of items taken by Mountain Wagtails, and beetles 15·3% of those taken by Grey Wagtails. Fly larvae and blackflies (Simuliidae) formed only 4% of the Mountain Wagtail diet, whereas chironomid and simuliid larvae formed 11% of the Grey Wagtail's food. Caddis flies and stoneflies were taken in small numbers by both species. In addition, Mountain Wagtails were also observed to catch large dragonfly nymphs, butterflies and tadpoles, and a Grey Wagtail caught a small orange pierid butterfly of the genus *Pholotis*.

Most motacillids investigated appear to be very catholic in their choice of insect and other arthropod food, and also to be opportunistic. They all take a wide range of prey, the composition of which depends on the abundance of different arthopods, the size of the bird, and the habitat, location, season and weather. Insects are undoubtedly the most important food for all species of pipit, longclaw and wagtail, and certain orders of insects feature most prominently in the diets of many of them. For example, orthopterans and coleopterans are the most important prey for many terrestrial motacillids. They form a major component of the diet of longclaws. Grasshoppers and beetles were found in 69% of 51 Grassveld Pipit stomachs. Buffy Pipits showed similar prey preferences, with beetles found in 76% of those stomachs examined and grasshoppers in 69%; moths and hymenopterans were the next most numerous items. Plain-backed and Buff-bellied Pipits also favoured grasshoppers and beetles, while beetles, grasshoppers and ants were numerically the most important prey items for Tawny Pipits in Moldova, Crimea and Kazakhstan. Adult Tree Pipits consume large



Pipits, wagtails and longclaws are birds of open country, so it comes as no surprise that they are a falcon's favourite snack. Indeed, Meadow Pipits (Anthus pratensis) *form 70-80% of the diet of Merlins* (Falco columbarius) *on some British moorlands. Given the scale of this threat, it is of vital importance that motacillids maintain a watchful vigilance for raptors. All this goes some way to explaining why a* ***White Wagtail****, of the race sometimes split as the "Amur Wagtail", is watching the skies with such interest through its beady eye. Admittedly, a cynic might suggest that it is actually the other eye that is peering downwards at an even smaller victim!*

[*Motacilla alba leucopsis*, Long Valley, Hong Kong. Photo: Martin Hale]





Pipits are not the most awe-inspiring of songsters, but they make up for their lack of melody and repertoire with gusto and sheer persistence. Like most of its genus, the ***Tawny Pipit*** *sings either in flight or from a perch. In both cases, the song is a monotonously simple, constantly repeated phrase, a rolling "tsirluii" or similar variant, each statement lasting less than a second, and followed by a few seconds of silence. This simple format is typical of larger pipits, while smaller species often give a more complex rendition. The* ***Tree Pipit****, for example, tends to have a much longer and more complex song, lasting 8 seconds, followed by a much longer pause. The song itself is a series of trills and repetitive notes, with the most distinctive and far-carrying section (often the only one heard) being a terminal sequence of long slurred notes, sounding like "chea chea chea". This distinctive and formulaic outpouring is often accompanied by a parachuting song flight. During this flight, and unlike the Meadow Pipit* (Anthus pratensis) *of nearby fields, it dangles its legs during descent. Another straightforward distinction between these species is useful when the distinctive songs are out of earshot: Tree Pipits almost invariably land back in a tree, whereas Meadow Pipits usually drop all the way to the ground.*

[Above:
Anthus campestris campestris,
Igea, Spain.
Photo: Eduardo Ayala.

Below: *Anthus trivialis trivialis*,
Kizilçahamam, Turkey.
Photo: Hanne & Jens Eriksen]



*The **Rosy-breasted Longclaw** is typical of its genus in producing most of its territorial songs from an exposed perch. It sings a simple repetitive loud, metallic phrase, "wee-tjihwee-tjih", or else a series of squeaky whistles ending in a drawn-out wheezy note: "pink-pink-pink-zheenk". These sounds are designed to carry far across the open country of the African savanna. At times, the song may alternatively be given during a brief, fluttering display flight.*

[*Macronyx ameliae wintoni*, Masai Mara National Park, Kenya. Photo: Muriel Nicolotti/Bios]

numbers of beetles, especially weevils (Curculionidae), carabids, scarabaeids and elaterids, whereas they feed their chicks with fewer beetles but more grasshoppers, flies and caterpillars; grasshoppers made up 63% of the nestling diet in one study. Beetles formed 14%, 22·4% and 31·2% of prey items taken by Meadow Pipits in Wales, Norway and Germany, respectively.

Dipterans and adult or larval moths and butterflies are also common prey for many motacillids. Flies and their larvae are taken in huge numbers, notably by smaller species such as the Meadow Pipit, as well as the Grey Wagtail. In three study areas in Britain, Norway and Germany, dipterans formed, respectively, 49%, 18% and 23·4% of the food items taken by Meadow Pipits. Caterpillars are readily eaten by most motacillids, but adult butterflies and moths are more difficult to catch unless they are resting in vegetation, as in cool or wet weather, or are newly emerged. Wagtails are more adept at capturing butterflies than are other motacillids. As has been observed in Ethiopia, when a Grey or Mountain Wagtail seizes a butterfly, it often removes the insect's wings before eating it or feeding it to its young. Other species, such as the African Pied Wagtail, do the same. On the Okavango River, in northern Botswana, these wagtails discarded the wings of various butterflies, depositing them on sand by the river. T. B. Larsen identified the wings as belonging to four species of white butterfly of the family Pieridae, the members of which are supposedly distasteful to birds, one species of lycaenid, two nymphalids, including the large strong-flying *Charaxes phaeus*, and a species of hesperid.

Worms appear to be eaten only rarely, although they may be overlooked in stomach and faecal analyses. Meadow Pipits and wagtails that forage at sewage works, especially in the non-breeding season, take many small red worms of the species *Lumbricus rubellus*. Annelid worms are included in the diet of African Pied Wagtails and polychaete worms in that of Rock Pipits.

Aquatic insects, both larvae and winged adults, are major items in the diets of all riverine species. Mayflies, caddis flies, stoneflies, and chironomids and other dipterans, many of aquatic origin, have all been identified as the most important prey for Grey Wagtails in the breeding season in studies in Wales, Switzerland and the Czech Republic. Motacillids living by rivers, lakes, marshes or other wetlands sometimes prey on damselflies and dragonflies, even relatively big species such as the southern hawker (*Aeshna cyanea*). These are large, energy-rich food items for a wagtail, but offset against this are the energetic costs incurred in catching and dealing with such prey. The bird must first immobilize the insect, and then break up or manoeuvre it to enable the food to be swallowed. Any motacillid that catches a large dragonfly or damselfly, or other large prey such as a grasshopper, usually beats the insect repeatedly on the ground or a rock in order to kill it. It may then dismember the prey by hammering at it with the bill, or it may remove the wings. Grey Wagtails, when they caught damselflies of the two species *Agrion splendens* and *A. virgo*, were observed to remove all four wings of each insect before presenting the food to nestlings or juveniles. Dragonflies emerging from nymphs are easily captured, and a mass emergence provides a useful, if temporary, source of food.

Other than spiders, which feature fairly commonly in motacillid diets, a number of arachnids are eaten by the members of the family. Ticks (Acarina) are possibly eaten by Cape Wagtails, for example, and scorpions (Scorpiones) have been recorded as prey of Long-billed Pipits.

Crustaceans and marine molluscs represent important food for coastal species. During the winter months, when grassland on its subantarctic island is covered with snow, the South Georgia Pipit relies on small marine invertebrates along the shore and around tidal pools. The diet of Rock Pipits living on the coasts of north-west Europe includes small isopod crustaceans such as sea slaters (*Ligia*), amphipods such as sandhoppers (Talitridae), and small crabs. Cape Wagtails have been watched as they caught fiddler crabs at low tide on a South African estuary; the wagtails were seen to beat each crab against a stone until its appendages were shed, thereby gaining access to the claws, legs and carapace. Similarly, African Pied Wagtails sometimes prey on small ghost crabs on the Kenyan coast, and Australasian Pipits have been observed to feed on crabs in New Zealand.

While freshwater and terrestrial molluscs are eaten by many motacillids, marine molluscs, such as dog-whelks (*Nucella*) and,

*Most wagtails and pipits call frequently, especially in flight, with simple notes of the style "swit", "chirp" or "chirrup". These flight calls are one of their most characteristic features, and often betray their presence as they fly high over a prairie or a city centre, where they would not otherwise have been noticed. Unlike pipits, however, wagtails sing rather infrequently, although when they do they have a surprisingly sweet song. The **African Pied Wagtail** is typical in producing a sustained garbled series of whistling and piping notes, involving lots of different note types, and, according to some listeners, much mimicry.*

[*Motacilla aguimp vidua*, Kruger National Park, South Africa. Photo: Johannes Ferdinand]





*Like all its relatives, the **Striped Pipit** undertakes most of its foraging on the ground. It subsists on a diet largely comprising insects and their larvae, all of which it catches by busily walking to and fro and pouncing on food items detected by sight. Its bill is ideally suited to the task of snatching at mobile prey, being long, sharp and pincer-like. Unlike most pipits, this species often forages among and over rocks; indeed throughout much of its range its distribution seems rather tied to the presence of rocky habitat.*

[*Anthus lineiventris stygium*, Marondera, Zimbabwe. Photo: Peter J. Ginn]

particularly, small periwinkles (*Littorina*), form a very significant part of the diet of Rock Pipits in Europe, notably in the winter months. So, too, do isopods of the genus *Idotea* and, in the late summer, amphipod hoppers (Talitridae). In the Netherlands, groups of wintering Rock Pipits fed almost exclusively on the mollusc *Asiminea grayana*, while the winter diet in Norway was mostly of crustaceans. Cape Wagtails foraging among seaweed-covered rocks along the southern coast of South Africa may also take small crustaceans or molluscs, but kelp flies (Coelopidae) are a favoured prey.

Vertebrates are comparatively rarely taken by motacillids. Amphibian tadpoles are eaten by Mountain and Grey Wagtails, and probably by other riverine and wetland species, and small frogs are eaten by Rosy-breasted Longclaws. Fish have been reported as prey for a number of species, ranging from Rock and Water Pipits to White, African Pied and Grey Wagtails. One Rock Pipit was seen to carry several rocklings, probably of the species *Gaidropsarus vulgaris*, which were 2-2·5 cm long, and a sandeel (Ammodytidae) of 5-6 cm; it seems likely, however, that the bird scavenged the fish from the entrance to an Atlantic Puffin (*Fratercula arctica*) burrow, where the food had either been discarded by a puffin or been dropped by one when harassed by gulls (*Larus*). One observer watched a Water Pipit as it caught a fish through a crack in ice, and Grey Wagtails have often been seen to catch fish fry and small minnows (*Phoxinus*), as well as sticklebacks (Gasterosteidae). In south-east England, a White Wagtail also caught perch (*Perca fluviatilis*) fry 3·5 cm long on two consecutive days; it flew off with the fish for its young, on one occasion carrying three fish crossways in its bill. In another instance, the staple diet of young Grey Wagtails bred in captivity was small fish; the female wagtail fed her chicks with the provided minnows, fish fry and a few sticklebacks, ignoring a supply of maggots.

When a wagtail or pipit catches a fish, it repeatedly beats it, in the manner of a kingfisher (Alcedinidae), before swallowing the fish head first. Sometimes, the spines on a stickleback can cause problems. For example, a Grey Wagtail, having caught a small stickleback at a garden pond, first beat it repeatedly on the concrete edge of the pond. It then tried to swallow the prey head first but had great difficulty, perhaps because the fish had managed to raise its spines, and for several minutes the wagtail was in apparent distress, opening and closing its bill, as it attempted to swallow the fish.

Surprisingly, lizards have apparently been reported as prey only for the Madagascar Wagtail, once, and for the Tawny Pipit. In the latter case, the remains of an unidentified lizard were found in a stomach from Kazakhstan, and there is a record of an individual taking a sand lizard (*Lacerta agilis*). Observations suggest that Cape Wagtails possibly capture and eat small chameleons (*Chamaeleo*) on occasion.

Seeds, berries and grit have been found in the stomachs of many pipits and wagtails. Seeds were, for example, found to have been ingested by Berthelot's Pipit and various longclaws, and were present in 12% of 51 stomachs of Grassveld Pipits examined. Meadow Pipits take seeds from a wide range of plants, including the grasses *Poa* and *Alopecurus*, rushes (Juncaceae), sedges, heaths (Ericaceae), crowberry (*Empetrum*), the families Cruciferae and Rosaceae, docks (*Rumex*), goosefoots (*Chenopodium*), flax (*Linum*), eyebright (*Euphrasia*), violets (*Viola*) and figworts (*Scrophularia*). Tree Pipits in Russia had consumed fruits of three species of *Vaccinium* and of elder (*Sambucus*), as well as seeds of violets, Labiatae, chickweed wintergreen (*Trientalis*) and cow-wheat (*Melampyrum*), and of birch (*Betula*) and pine (*Pinus*); aspen (*Populus tremula*) buds and spruce (*Picea*) needles were also taken. Similarly, seeds from a variety of families were found in 9% of 57 stomachs of Australasian Pipits. Clover seeds (Leguminosae) were most numerous, followed by seeds from grasses, and those of the families Compositae, Plantaginaceae, Cyperaceae, Polygonaceae, Labiatae, Cruciferae, Caryophyllaceae, Ranunculaceae and Rubiaceae.

At least a dozen other pipits are known to feed at times on seeds or berries. The New Guinea Pipit (*Anthus gutturalis*), for example, supplements its insect diet with seeds, particularly those of grasses, along with berries and green herbaceous matter. Further, the Paddyfield Pipit has been recorded as eating grass blades, as well as other vegetable matter, in India, and the Water Pipit consumes algae, in addition to other plant material. Among the wagtails, the White-browed Wagtail is reported as eating seeds occasionally.

Vegetable material may be more important at times when insects are scarce, as during the winter months. Seeds were noted in the stomachs of Tawny Pipits mainly at this time. Yellow Wagtails



Lepidopteran larvae constitute one of the principal sources of food of several pipits, including the ***Red-throated Pipit****. In one study, over a quarter of the summer diet of this species was made up of caterpillars. This juicy intake is supplemented by a range of other invertebrate items, including large numbers of beetles and spiders, and smaller quantities of centipedes, molluscs and annelid worms. Although its plumage is relatively modest, this species is the most brightly coloured member of the genus* Anthus.

[*Anthus cervinus*, Mai Po, Hong Kong. Photo: Martin Hale]

eat berries of the saltbush (*Salvadora persica*) and other plant material in their African non-breeding quarters, and White Wagtails sometimes take oat grain in India. The nectar of *Erythrina* flowers is a food source for wintering Tree Pipits in both regions.

Grit is ingested by some motacillids. Of a sample of 304 Meadow Pipits, for example, 131 had grit or small stones in the stomach, most of those with grit being young birds; one individual had as many as 18 stones in its stomach. Grit has been found also in Grassveld, Buffy, Olive-backed and Rosy Pipits, and quartz grains are usually present in the stomachs of New Guinea Pipits. One Grey Wagtail had swallowed ten small stones. It is widely believed that grit is usually taken by birds as a means of helping to break up food. As many motacillids seem not to ingest such material, however, this may not always be its function. It is possible that the grit supplies minerals. Interestingly, feathers have been discovered in a small percentage of stomachs of Buffy Pipits examined in Zimbabwe, and have also been found in those of Grassveld Pipits.

Some members of the family indulge in scavenging or are attracted to artificial food sources. White Wagtails, African Pied Wagtails and Meadow Pipits readily take advantage of crumbs, suet and other household scraps, and African Pied Wagtail have been recorded as feeding on discarded meat scraps. Meadow Pipits have even been seen to take breadcrumbs to their young. During the winter months, Yellow Wagtails and Meadow Pipits often forage for scraps on refuse tips and both are also attracted to supplies of mealworms (*Tenebrio molitor*). In southern Africa, Cape Wagtails frequently visit gardens, where they have been observed to eat raw meat, fat, suet, cheese, hard-boiled egg, mealie meal, cake and bread; this species sometimes becomes tame enough to enter houses and peck at morsels of food on the floor. There are reports of White Wagtails scavenging the remains of dead fish and pecking at the corpse of a gull, and one individual of this species in Norway attempted to feed from strips of meat hung out to dry. Some of the more bizarre reports, from England, involve a Grey Wagtail that entered a fishing-tackle shop in the city of Liverpool and took maggots (dipteran larvae) from trays, and another that visited the polar bear (*Ursus maritimus*) enclosure at Chester Zoo and fed on flies attracted to meat. Others of this species have been watched as they picked insects from piles of feral pigeon droppings and from sacks of grain.

As motacillids are able to capitalize on whatever is temporarily abundant in any habitat, diet inevitably changes throughout the year as different insects emerge and reach peak numbers. Although termites form an important component of the diet of most motacillids in Africa, these insects are available for a limited time. The birds usually prey on the winged termites, or alates, but these emerge only after rain. Changes in diet of the Meadow Pipit occur through the breeding season, as has been demonstrated in studies in Snowdonia, in Wales. Here, the pipits exploited a range of prey species, but flies, especially craneflies, were of particular importance, accounting for 43% of the food intake in April, 74% in May and 47% in June, and declining thereafter. The highest percentage of beetles in the diet was reached in July, and that of hymenopterans and hemipterans in August, while spiders and moth caterpillars were favoured in March; these months coincided with the periods when each of these respective invertebrate groups was available in the highest numbers. Another study of Meadow Pipits, in the English Pennines, revealed interesting differences between the food brought to early broods and that delivered to late broods. The adults supplied first broods mainly with craneflies, which made up 85% of items, with mayflies representing 11%, other adult flies 3%, and fly larvae and stoneflies each 0·5%. Later in the season, when the birds were feeding second broods, craneflies dropped to 41%, whereas mayflies increased to 30% and adult flies and moths formed, respectively, 11·5% and 7·4% of the nestling diet.

Changes in the diet of Red-throated Pipits during the breeding season have also been noted. In north-west Finland, spiders and tipulid larvae formed a large component of the prey in late May to early June, tipulids and mosquitoes (Culicidae) figured prominently in mid-June, while larval and adult hymenopterans, lepidopterans and coleopterans were eaten later in the season. Similarly, in a study of breeding Tawny Pipits, the diet of the chicks was found to change during the course of the fledging period. Newly hatched chicks were fed mostly with grasshoppers, which accounted for 30% of items, and larval and adult moths, which made up 21%, with smaller numbers of spiders and beetles; at 3-6 days they were given a larger proportion of grasshoppers, 58%, while spiders increased to 19% and beetles to 17%; chicks older than 7 days received mainly grasshoppers, which formed 62% of their food. Differential availability

of prey species may be the cause of these dietary shifts. Alternatively, it is possible that the adults select different prey as the young mature.

Of course, details of diet will also vary according to the habitat. For example, wintering Yellow Wagtails that fed around cattle in West Africa preyed mainly on bugs, beetles and flies. Those foraging at cowpats ate beetles, whereas those feeding in lush grass consumed bugs and ants and those along streams exploited the aquatic larvae of flies and dragonflies. After rain, all wagtails fed on winged termites and homopterans.

The two main foraging strategies of all wagtails, pipits and longclaws involve picking prey from the ground or vegetation, and flycatching by plucking insects from the air while in flight. Other strategies, such as hovering, are also used, as are variants of the two primary methods. In Nigeria, for instance, eight distinct foraging techniques of Yellow Wagtails were recognized. The long, strong legs and claws of most motacillids are adaptations for walking on the ground, and all of the species commonly forage in this manner, picking prey from the surface of the ground, from rocks or shoals in rivers, from mud or the water surface, or from vegetation. Pecking rates are very high. Various studies have shown that Pied, Mountain and Grey Wagtails and Rock Pipits take 15-20 food items, and occasionally more, per minute. Rock Pipits have been recorded as taking 33 small periwinkles per minute and 35 larvae of chironomid midges per minute. Although they usually catch readily observed prey, pipits and wagtails will also turn over leaf litter to find food items. Wading into shallow water to pick aquatic invertebrates is a foraging strategy used by most wagtails, and by those pipits and longclaws that favour wetland habitats. Citrine Wagtails will even immerse the head in order to pick up insect larvae. Some members of the family, such as Grassveld Pipits, break up dung to find beetle larvae and other prey, and longclaws use their strong feet and claws to scratch open termite burrows.

Yellow Wagtails are well known for associating with grazing cattle or game, especially in their non-breeding grounds in Africa, where Cape Longclaws are also found in the same situation. The birds feed around the feet of the mammals and benefit from the insects flushed from the grass by the animals' movements. Such behaviour is also common among Tawny, Richard's and Plain-backed Pipits. White Wagtails sometimes take insects from the heads of cattle and deer, and in Germany one was seen to pick for insects while perched on the back of a pig. Associations with humans have also been reported. For example, a Rock Pipit was observed as it followed a man in a tractor who was collecting pebbles on a beach; the pipit picked up sandhoppers and other arthropods that were exposed by the tractor's activity. Similarly, Cape Longclaws will follow a plough and snatch prey items turned over by it. White Wagtails regularly follow machines, even lawnmowers, to take advantage of disturbed or injured insects. In the Azores, the resident Grey Wagtails were drawn to sites on the coast where whalers were cutting up whales, which, in turn, attracted numerous flies.

Several motacillids, such as Tree, Olive-backed and Woodland Pipits, and Forest Wagtails, sometimes forage in trees, where they walk along branches and pick insects from the foliage or other vegetation. Tree Pipits, for example, were observed leaf-gleaning in Portugal and in Africa. Surprisingly, even Rock Pipits have at times been observed to feed in trees.

Picking is used for rather inactive terrestrial prey. When the prey species is more active, however, the bird may dart or run forwards, a strategy sometimes referred to as "darting" or "run-picking", as it pursues and seizes the victim. Another technique involves reaching up or even jumping into the air to snap up flying prey, or flying out from a perch to do so. In South Africa, C. J. Skead observed a Cape Wagtail that fed by standing and facing into a light breeze and snapping up kelp flies as they drifted past.

Aerial flycatching is an important strategy for some wagtails, notably the long-tailed Grey and Mountain Wagtails, which, during the breeding season, inhabit mountain rivers and streams in Eurasia and in Africa, respectively. These two species commonly fly out from a branch or other perch and catch insects over the water. Flycatching is prevalent in warm, sunny weather, when insects are on the wing. On cooler or wetter days, picking and run-picking are the foraging methods adopted. In Europe, for example, flycatching by Grey Wagtails is much less common than picking during the winter months. Although all wagtail species will forage by flycatching, this technique is correlated with tail length, and is practised more frequently by the longer-tailed species than it is by the shorter-tailed ones. This is evident, for example, in western Europe, where Grey Wagtails adopt



*The **Rock Pipit** is the only species of motacillid restricted to Europe. The bird seen here is foraging in its classic tideline niche, surrounded by drifts of wrack and stems of kelp. An in-depth study in Cornwall, south-west England, determined that the winter diet of this bird consisted largely of molluscs such as periwinkles* (Littorina), *chironomid larvae, kelp fly larvae, and various isopod crustaceans such as sea slaters, sandhoppers and crabs. The Rock Pipit is even known to catch and eat small fish, for example sandeels* (Ammodytes), *which it beats against a rock then swallows head-first.*

[*Anthus petrosus petrosus*, Ouessant Island, France. Photo: Rafael Armada]



In a detailed study of foraging habits in the ***Australasian Pipit*** *the gizzards of 57 birds were examined. Of these, the vast majority (80%) had consumed almost exclusively invertebrates (at least 90% by dry-weight of contents). This individual has captured a large orthopteran, a favourite prey-item according to the aforementioned research: grasshoppers or crickets of some description were present in 18% of the gizzards studied. The most popular items, however, were beetles, hymenoptera (mostly ants) and dipteran flies; these were present in 77%, 67% and 63% of gizzards, respectively. In addition, small numbers of molluscs, including an aquatic snail, and crustacean, including small crabs, were noted in the diet. The remainder of consumed food was usually made up of seeds taken from a wide variety of plants.*

[*Anthus novaeseelandiae*, Goomboorian, Gympie, Queensland, Australia. Photo: ANT/NHPA]



The range of invertebrates recorded in the diet of the ***Tree Pipit*** *is truly impressive, spanning from spiders, beetles and earwigs to lacewings, termites, millipedes and grasshoppers. It is also known to eat snails, and the vegetable portion of its diet includes fruit and buds, seeds and grains, and even nectar of* Erythrina *flowers on its wintering grounds. For a bird with such a fine bill it is therefore something of a generalist. Despite this variable food supply, one item exerts more influence on the life-cycle than any other: the caterpillar. The Tree Pipit is a migratory bird, returning to temperate heathlands and woodland edges in the spring, and timing the onset of breeding to coincide with the flush of caterpillars and other soft-bodied insects in these habitats. Under normal circumstances, a Tree Pipit will swallow caterpillars one at a time, but when there is a hungry brood to feed, a whole beakful is required.*

[*Anthus trivialis trivialis*, Capel Cynon, Llandysul, Wales. Photo: Melvin Grey/NHPA]



*In general, longclaws feed in a similar fashion to pipits, and target similar prey. The **Cape Longclaw** usually picks food from the ground, but it has been seen performing repeated aerial sallies after flying prey, usually alate termites swarming upwards, after rain. Unlike pipits and wagtails, it even uses its robust legs to scratch at termite mounds, opening tunnels and extracting prey items from within. Orthopterans and coleopterans are its favourite food, and indeed they seem to make up around two-thirds of the diet of most large terrestrial grassland motacillids.*

[*Macronyx capensis*, South Africa. Photo: David Hosking/ FLPA]

flycatching as a foraging strategy much more frequently than do the comparatively short-tailed Yellow Wagtails, while White Wagtails are intermediate in this respect.

Pipits and longclaws are mainly terrestrial feeders and have a more restricted range of foraging techniques than do the wagtails. Nevertheless, they do occasionally fly up into the air for a short distance in order to grab a flying insect. One notable record, in England, was of a flock of 50 Meadow Pipits all of which were flycatching in sunny weather at a sewage farm in Surrey. When winged termites are emerging, however, as in the Afrotropics, all motacillids will try to catch these, either in the air or on the ground, and almost invariably accompanied by a wide variety of other avian species.

Hovering demands much expenditure of energy, and it is not a strategy commonly used by members of this family. Individuals occasionally hover briefly in order to snatch an insect from tall vegetation or rocks, but there are several records of more persistent hovering. In one case, a female Grey Wagtail in Ireland was observed as it collected insects from tree trunks. The bird hovered about 1 m above the ground in front of one tree, moving around it while still hovering, and every few seconds moving closer and picking insects from the bark. It repeated this at another tree, before carrying off the insects to its nestlings. Similar persistent hovering was noted for a White Wagtail, which hovered 10 cm above the ground while it snapped up small winged insects just above a patch of tall grass. Such bouts lasted for half a minute at a time. Yellow Wagtails occasionally hover over grass or around cattle in order to pick off insects.

Foraging strategies vary from one species to another, and the strategy adopted by any species will depend very much on the habitat and on the availability of potential prey. For example, in open grassland or at the muddy edges of pools where there is much terrestrial prey, picking is the most frequent strategy. By rivers where there are at times many winged insects, flycatching can be important. A study in the UK showed that, when Yellow Wagtails were feeding at shallow pools, picking was the method used almost exclusively; when feeding around cow pats, on the other hand, picking was still the main method used, but darting and flycatching were also important, together representing over 16% of observations. An intriguing observation was made in New Guinea, where wintering Yellow Wagtails were seen to spin around in tight circles, but it is not known if this is a feeding tactic.

The season of the year and the ambient temperature, because they affect the availability of winged insects, also determine the method of foraging. During the winter months, when many insects have larval or nymphal stages, or during periods when small insects are grounded because of wet and cold weather, motacillids pick prey items from the ground. When temperatures rise and, for example, small midges become active, run-picking and jumping are employed more. Hovering or vegetation-gleaning may be adopted when a mass emergence of damselflies takes place from nymphs that have crawled up vegetation on a riverbank. In warm sunny weather, as in the northern spring and summer, when numerous mayflies and caddis flies are on the wing, it becomes more profitable for Grey Wagtails to hunt these by using aerial flycatching from a perch. Most motacillids are very adaptable and can quickly switch from one foraging strategy to another, more profitable one.

Foraging locations can also change according to season and weather. In the Czech Republic, it was found that the foraging location of Grey Wagtails changed both with weather conditions and with the height of the water in the river. In dull weather, the wagtails exploited mainly the area around the river edge, picking prey from above and just below the water's surface. They also foraged by picking in riparian vegetation. When water levels rose after a storm, and at times of low insect activity, the wagtails temporarily exploited such places as piles of flood debris, dead branches, wet ground and manure. This ability to switch to different prey and quickly to change foraging strategy and locations is exhibited by many other members of the family, the Water Pipit being just one example. In Africa, many pipits and longclaws often appear very quickly at recently burnt ground, where prey is presumably more visible. Grassveld and Bush Pipits and Cape Longclaws forage on grassland within an hour of its being burnt or on the following day. Rock Pipits, too, change their foraging locations between seasons and in accordance with temperatures. A study of this species in south-west England revealed that, in the summer, the Rock Pipits fed in vegetation above the cliffs, where insects were more active, whereas in the winter they foraged along the shore; moreover, they were also found on the shore



*The **White Wagtail** has the habit of walking in water in pursuit of aquatic larvae and nymphs. This individual has snatched just such an item from the surface of a puddle, but wagtails hunting in wetlands are by no means restricted to insect prey. The British race of this species was once watched catching the fry of a perch* (Perca fluviatilis) *to feed to its offspring. Indeed, on one visit it managed to carry three of these fry crossways in its bill, as if auditioning to be a puffin* (Fratercula)*!*

[*Motacilla alba leucopsis*, Long Valley, Hong Kong. Photo: Martin Hale]

on cool summer mornings and, conversely, they moved to the cliff tops to forage inland on mild winter days.

Seasonal changes in foraging location are well demonstrated by the Grey Wagtail. In the breeding season, this well-studied species shows a preference for feeding by upland rivers in the vicinity of riffles, or where broadleaf woodland borders the riverbanks. The insect communities in riffles, areas where fast-flowing shallow water runs over rocks or pebbles, are dominated by chironomid midges, blackflies, mayflies and caddis flies. Riffles are, therefore, rich feeding areas. Likewise, insects falling from trees into rivers provide abundant and often large prey, such as caterpillars. In the winter months, Grey Wagtails forage in a wider variety of habitats, and often away from upland rivers and streams. They then visit farmyards and dung heaps or slurry pits, ponds, sewage works, watercress beds, gardens and parks in towns, and lowland rivers. The visits made to Liverpool city centre by a maggot-eating Grey Wagtail, mentioned above, took place in the winter months, when insects are scarce.

Several other species, notably long-distance or altitudinal migrants, also switch habitats in the winter. Water Pipits, for example, descend from mountain pastures to lowland habitats, including watercress beds, and Meadow Pipits move from upland moorland to lowland pastures, coastal habitats and sewage works.

Even individuals of the same species, foraging in the same location, may exploit different niches. In Nigeria, wintering Yellow Wagtails were found to use four types of foraging niche. Most of them foraged in association with cattle, some 80% of the local population using this niche during the dry season. Fewer than 20% set up territories along streams, the males being territorial through the dry season. About 10% of the wagtails foraged in cultivated areas. Other habitats in grassland were utilized after rain, or wetter areas of it exploited intermittently. In the winter months, some White Wagtails may display territorial behaviour and defend small piles of food. If food is more evenly spaced, then they feed in flocks.

Where two or more motacillids share a habitat, differences in foraging behaviour, including both technique and location, as well as differences in choice of prey, may help to segregate them. The species' size and the length and width of its bill also influence the size of prey taken. The long tail of the Grey and Mountain Wagtails enables these species to balance on rocks in torrential streams and to reach over and catch prey on the rocks at or below the water surface; White Wagtails tend to overbalance if they try this technique. In Japan, studies of White and Japanese Wagtails on a river during the winter showed that the two species had similar feeding techniques, spending most time in picking on the ground. Compared with Japanese Wagtails, however, White Wagtails did more flycatching and foraged in drier areas, often well away from the river. A Swiss study revealed that Grey Wagtails spent 50% of their foraging time within the river corridor, and a further 18% and 13%, respectively, on paths and in meadows. White Wagtails using the same area also foraged along the river, but they fed predominantly in meadows and on paths, and also in sedges. In a further example, from a study undertaken near Oxford, in England, Yellow Wagtails relied heavily on picking, as opposed to run-picking and flycatching, whereas White Wagtails in the same habitat used the picking technique less frequently and both run-picking and flycatching more so.

In parts of Africa, migrant territorial Yellow Wagtails are potentially in competition with Plain-backed and Red-throated Pipits. The Plain-backed Pipits are larger and heavier, but rather few in number, and their impact therefore is probably small, although an individual does displace any Yellow Wagtail that it encounters. The smaller-bodied and smaller-billed Red-throated Pipit gives way to Yellow Wagtails, but it occurs in large numbers in the same habitat. It has been suggested that both pipits have a more limited range of feeding techniques compared with Yellow Wagtails. The pipits peck and fly close to the ground, and so they probably have a more restricted diet than does the more versatile Yellow Wagtail.

Pipits, longclaws and wagtails are sometimes robbed of their food by larger species of bird. In the Afrotropics, for example, there is a record of a Fork-tailed Drongo (*Dicrurus adsimilis*) diving at a Cape Longclaw in an attempt to steal its food, and it is reported that Fiscal Shrikes (*Lanius collaris*) frequently kleptoparasitize these longclaws both in rank grassland and in burnt or mown grassland. On the other hand, wagtails may occasionally kleptoparasitize other birds. In Britain, a White Wagtail of the local race *yarrellii* was observed as it harassed a Northern House Martin (*Delichon urbicum*), so much so that the martin presented the wagtail with a foodball, expelled from its own mouth.

It seems probable that the majority of motacillids obtain sufficient water from the normal diet that they do not need to drink. In very arid areas in Botswana, however, both the Grassveld Pipit and the Buffy Pipit have been observed to drink at a small pool.

Breeding

Although a few species have been studied in detail, rather little is known of the breeding habits of many motacillids, especially those in South America and in Africa. Data are virtually or entirely lacking for such species as the Long-legged Pipit and the newly described Long-tailed Pipit. For those motacillids for which sufficient information is available, it seems that the courtship displays and the type of nest built vary only little among the species.

Monogamy is the standard breeding system among the pipits, longclaws and wagtails, but a small proportion of individuals of some species may be polygynous or polyandrous. In a study of the Water Pipit, K. Bollmann found that, of 278 social mating groups, 86% were monogamous; of the remainder, 9% referred to bachelors, 3% to polygyny and 2% to polyandry. He concluded that age was the most reliable criterion for mate choice and that monogamy can be expected to be the dominant system, especially when both parents are required to incubate the eggs and to feed and rear the young. Polygyny occurs rarely among Meadow and Tree Pipits, but a 32% incidence of polygyny was found among Rock Pipits and a 6·7% incidence among Tawny Pipits. It is possible that, as more detailed studies of the mating systems of other species of motacillid are carried out, polygyny or polyandry may be found to be widespread, if occasional, among the members of this family.

Timing of breeding is correlated with periods of peak insect activity and vegetation cover. Across the northern and central parts of the Northern Hemisphere, motacillids invariably breed in the spring. In the Afrotropics, many breed during or just after rains, when there is good ground cover to conceal nests and an abundant supply of insect food. A few species, such as the Cape Wagtail in southern Africa, may breed at any time of the year and more or less continuously throughout it. African Pied Wagtails breed for six months of the year in Malawi, starting before the rains and continuing through them, with peaks of laying in March and October. In Zimbabwe they breed in all months except May and January, but breeding activity reaches a peak from August to October, before the rains.

For a given species, the timing of breeding may vary from year to year, with egg-laying starting earlier in mild springs and later in cold weather. In a study of the British subspecies *yarrellii* of the White Wagtail, it was shown that April temperatures affected the timing of laying. On average, a 1°C rise in mean April temperatures led to a 7% increase in the proportion of clutches started in April; a temperature increase of 1°C brought forward the mean first-egg date by about two days. Moreover, there is some evidence that Grey Wagtails in Wales have gradually been laying earlier over the period from the 1980s to the late 1990s, with more clutches now being started in March or early April than was previously the case.

In the Palearctic Region, breeding occurs earlier, and continues for longer, in the south and west of a species' range, and takes place later at high latitudes farther north. Meadow Pipits, for example, nest from early April until August in central and western Europe, whereas in Swedish Lapland they lay only from mid-June until early July. Likewise, Citrine Wagtails in southern Russia lay from late April, whereas in the north of the country laying starts in mid-June. Similarly, Red-throated Pipits begin egg-laying at the end of May in the south of their range, but not until mid-June or even July in the north. A mass of information has been gathered on the breeding behaviour of Grey Wagtails, enabling a fairy comprehensive picture to be presented. The breeding season of this species begins a month earlier in southern Europe than in Sweden, while Grey Wagtails in Ireland breed earlier than those in Britain. Further, laying normally begins later at higher elevations. In the Swiss Alps, Grey Wagtails laid on average 12·7 days later for each 100-m increase in altitude. The birds had to wait until the snow had melted before returning to their high-altitude territories. The lowest-lying territories in the Alps were occupied in mid-March, those between 1100 m and 1200 m by mid-April and the highest ones, those up to 1300 m, not until the middle of May. Grey Wagtails in Germany laid two days later for each 50-m increase in altitude. Meadow and Berthelot's Pipits are just two examples of other species that lay later at higher elevations.

All motacillids for which sufficient information is available establish breeding territories. Although the Citrine Wagtail may



*The **Cape Wagtail** spends most of its time in classic wagtail fashion, darting around pastures, beaches, lawns and cultivation, and very often beside water, in fact virtually anywhere where there are small insects to be snatched from the ground or surrounding air. In some regions of South Africa it has become so tame that it enters houses and feeds on the kitchen floor for crumbs. Along with several other wagtails it will make short aerial sallies from higher perches, or longer fluttering pursuits of airborne prey in the manner of flycatching birds. In this instance, it has caught a damselfly. With insects of this type, wagtails normally knock off the wings before swallowing the body.*

[*Motacilla capensis capensis*, South Africa. Photo: HPH Photography/ Bruce Coleman]



Wagtails living on fast-running streams tend to forage by picking at the water or rocks for insects. They run about quickly, or walk, wagging their tails conspicuously, and they will also fly up a short distance to catch insects in flight. This ***Grey Wagtail*** *reveals its adroit foraging technique, and its penchant for aquatic larvae, by snatching one from rushing water. In fact, so keen is this species on wriggly prey, especially in winter, that one bird entered a fishing-tackle shop in Liverpool and collected maggots from a tray. In summer, adult dipteran flies were found to form an important part of the diet of this species in Wales, contributing 55-64% of items taken by adults. Similar results were obtained at other European sites.*

[*Motacilla cinerea cinerea*, Osona, Catalonia, Spain. Photo: David Vilasís]

nest semi-colonially, individual pairs are still strongly territorial. Territories of open-country species are roughly circular, but those of coastal and riverine species are linear. The territory of a Meadow Pipit includes the extremes of its foraging area around the nest, but within this it has a core area that it uses, and within this core area it has a normal living area.

Breeding African Pied Wagtails were found to have territory sizes of about 100 ha, but this is very large compared with the sizes recorded for many other motacillids. In the Austrian Alps, Water Pipits occur at densities of 0·8-1·8 territories per 10 ha, with 3·6 territories/10 ha recorded along the timber-line. Breeding densities of Tree and Meadow Pipits can reach 60 or 70 pairs/km^2, and occasionally more, in favoured habitats. Figures of 100 pairs/km^2 and 126 pairs/km^2 have been recorded for Tree Pipits in a German vineyard and on Swiss traditional farmland, respectively, and even higher estimates have been reported for Meadow Pipits, including 300 pairs/km^2 on water meadows in the former USSR and a staggering 964 pairs/km^2 on short grassland in Germany. Elsewhere, 1 km^2 of short tussocky grassland on the Kinangop Plateau, in Kenya, can hold up to 40 adult Sharpe's Longclaws, corresponding to 20 pairs, the mean home range of a pair being only 0·5 ha. Cape Wagtails are very common throughout much of their range, especially in southern South Africa, and farther north, at Sandwich Harbour, in Namibia, a few hundred pairs were concentrated in a small area around freshwater pools.

Riverine wagtails, as already stated, have linear territories. In Britain, there can be 20-40 pairs of Grey Wagtails along 10 km of upland river, and on rich wooded upland streams with steep gradients the distance between pairs can be no more than 200-300 m. In Germany and Switzerland, mean densities per kilometre of river of, respectively, 0·94-1·74 pairs and 1·26 pairs were recorded. In the Swiss Alps, however, the figure was 2·8 pairs on streams at the highest altitudes, where White-breasted Dippers (*Cinclus cinclus*) were absent. Elsewhere in Europe, observers have recorded territory lengths for Grey Wagtail pairs of: 250-450 m, occasionally more than 600 m, in the Czech Republic; 900 m in Denmark; and 520-775 m in different parts of Switzerland. In Germany, some Grey Wagtails had territories extending up to 2600 m, and on modified and polluted streams very low densities of just 0·01-0·05 pairs/km were found. In Japan, territory length is 300-500 m. Mountain Wagtails in Ethiopia and South Africa generally breed at densities of 10-25 pairs/10 km, and territory length can be as little as 400 m.

Among the very few truly coastal species, the Rock Pipit is the only one for which adequate information is available. Along the shores of north-west Europe, there can be densities of 3-5 pairs of Rock Pipits for every kilometre of suitable coastline.

Some wagtails are very aggressive when breeding, defending the territory not only from conspecifics but also from other species. White Wagtails, for example, will chase off Grey Wagtails or Japanese Wagtails that are nesting nearby, and Grey Wagtails sometimes pursue dippers. White Wagtails in Britain have also been recorded as chasing Common Ringed Plovers (*Charadrius hiaticula*) from the breeding territory, and African Pied Wagtails sometimes drive off Common Sandpipers (*Actitis hypoleucos*), although the latter are only non-breeding visitors to that continent.

Many motacillids have a courtship display-flight in which the male flies into the air and then descends, while singing, with vibrating raised wings and tail. The nature of this display-flight and the accompanying song are useful aids in the identification of pipits. Sprague's Pipit in North America has one of the most spectacular aerial flights, reaching 150 m or more above the ground. Some other species, such as the Yellowish and Ochre-breasted Pipits in South America, ascend to no more than 10-25 m. Another Neotropical species, the Correndera Pipit, rises to 40 m, and then hovers, or glides down almost to the ground, before climbing again, singing as it hovers or descends. Others, such as the Malindi Pipit in East Africa, normally sing from a perch, a small tree, a fence post or a termite mound, but some may fly out or down from the tree, singing as they descend. The Grey Wagtail has a wonderful parachuting display-flight: from a tree or overhead wire, the male descends, with the wings lowered and spread, the tail depressed and the yellow rump feathers conspicuously puffed up, singing all the while until it reaches the ground. The Tree and Olive-backed Pipits perform a similar parachute display, beginning from a perch in a tree. In contrast, the Short-tailed Pipit displays on the ground, with rapidly flicked wings, or flies a few metres above the ground in wide circles while giving nasal calls and buzzing wing-snaps.

Greeting displays are simple. Typically, the male, with his wings outspread and quivering, approaches the female. When the male



*This **Yellow Wagtail** is demonstrating a widespread habit of many pipits, longclaws and wagtails. When foraging, they often associate with grazing livestock, reaping the benefit of increased foraging success. Their hit-rate is likely to be higher for two good reasons. First, insects are attracted to livestock and commoner in their vicinity. Second, large mammals tend to disturb cryptic insects when they walk, making them easier for wagtails to spot. In this case the "beaters" are sheep, but more often than not they are cattle, and in the winter quarters it might just as well be herds of wild ungulates.*

[*Motacilla flava flava*, Lesbos, Greece. Photo: David Tipling/ Windrush]

White Wagtail arrives in the pair's territory, the female greets him by holding her tail and head raised at an angle of 45 degrees. She sometimes adopts a cringing posture, and quivers her wings in solicitation. Aggressive displays, often with the body plumage puffed up and the tail raised, are directed towards intruders.

Displays continue during the breeding cycle, the male displaying to the female at change-overs during the incubation stage. An interesting observation at the nest of a pair of Madagascar Wagtails may serve as an example. When the male delivered food to the brooding female, the latter left the nest and perched beside her mate; he proceeded to give a display during which he cocked his tail almost vertically and fluttered his closed wings rapidly, and then spread the wings slightly while shaking the body and singing.

All pipits and longclaws and most species of wagtail almost invariably build their nests on the ground, often in a hollow or



*While most food is taken from the ground, or in short aerial sallies, a variable proportion is taken from foliage. This **Yellow Wagtail** is probably searching for caterpillars and the like, hidden in the leaves of a flowering shrub. As well as insects, bushes sometimes provide a few berries or other plant matter, such as tiny buds. The plumage of this particular bird suggests a complex genealogical history. With its black head and bicoloured supercilium, it appears to be somewhat intermediate between "*superciliaris*" (itself an intergrade between* feldegg *and* flava*) and "*xanthophrys*" (an intergrade between* feldegg *and* lutea*). In many cases, the direct parentage of Yellow Wagtails cannot be deciphered.*

[*Motacilla flava*, Lesbos, Greece. Photo: Richard Brooks/ FLPA]



Wagtails, such as the ***Yellow Wagtail****, are capable of capturing highly manoeuvrable aerial prey. In most cases they are caught during "run-picks", which equates to a darting run towards a sitting insect, followed by an attempt to snatch it with the bill. If the insect is slow, it may be caught before it tries to escape. More usually, it takes to the air and the wagtail is forced to follow suit. A brief but agile fluttering sally into the air usually suffices, and if the insect is not caught in the first metre or so, the wagtail rarely prolongs its pursuit. Only slow-flying insects, such as alate termites and certain moths, are habitually chased in level flight.*

[*Motacilla flava iberiae*, Cantalpino, Salamanca, Spain. Photo: Francisco Martín Martín]



Field studies in temperate latitudes suggest that motacillids rarely drink, but in semi-arid tropical regions this rule does not hold. Moreover, wagtails and pipits often visit oases, saltpans and sewage farms in North Africa and the Middle East during migration periods. After a long, tiring flight, this ***Red-throated Pipit*** *is thirsty. It drinks in the manner common to all passerines, holding a draught of liquid in the bill, then letting it trickle down the throat by tilting the head.*

[*Anthus cervinus*. Photo: G. K. Brown/Ardea]

other depression, such as a footprint. The hollow may be excavated by the female, as in the case of Tree Pipits, or by the male, as occurs among Red-throated Pipits. The nest itself is generally built in or under vegetation, or close to a tussock, or under a rock. In a study in Germany, it was found that Meadow Pipits preferred sloping ground to flat ground, with 81% of nests being on slopes and ditchbanks; over 95% of nests were in depressions and more than 92% under sheltering vegetation. Nests of some species, such as Yellow Wagtails and Richard's and Red-throated Pipits, are sometimes at the end of short runs or tunnels through grass.

Few motacillids nest on or in trees, but the Forest Wagtail is a notable exception. This aberrant Asian wagtail always builds its nests on branches in trees, making a neat cup, the outside of which is covered with lichens. The nest is therefore well camouflaged against the lichen-covered branches. Trees are sometimes used, normally on an irregular basis, by a small number of other species. Grey Wagtails occasionally nest in trees in Europe, as, for example, in Wales, where pairs have built in the epicormic growth of lime trees (*Tilia*) and, less often, in forks of trees or on stumps, upturned tree roots being a more frequent site. In the Azores, however, tree nests are commonplace among the Grey Wagtails of the local subspecies *patriciae*. Yellow Wagtails have been known to build in willow stumps and in the forked branches of a thorn hedge, and Cape Wagtails often nest in bushes and sometimes in trees. As long ago as the 1960s, Winterbottom referred to 51 records of Cape Wagtail nests placed in or under bushes and 16 in trees in the Western Cape of South Africa, and twelve nests were found in trees in the north-east of that country. In areas liable to flooding, the Yellow-throated Longclaw may build its nest up to 15 cm above the ground on a tussock, with an approach ramp, and one pair was recorded as nesting 60 cm above the ground in an acacia bush (*Acacia*).

Crevices in banks and cliffs are used by Rock and Water Pipits and by Grey and Mountain Wagtails, and holes or ledges in buildings, walls and in or under bridges are common nest-sites for Grey, Mountain, White, African Pied and Cape Wagtails. Indeed, many Grey Wagtail nests are associated with artificial structures. For example, in Wales, where this species has received intensive study, more than 75% of nests were in or under bridges, in walls, or associated with buildings, weirs, dams or flood-protection works; on some Welsh rivers, almost all nests located were in such situations. Likewise, 80% of this species' nests in the Swiss Alps were in or on buildings, dams, walls, bridges and nestboxes, and on mountain rivers in the Czech Republic 81% of nest-sites were below bridges or associated with walls of weirs, with a further 11·4% in buildings. In Ireland, too, as many as 97% of nests were in or on artificial structures, mainly bridges. The White Wagtail displays a similar, if less developed, liking for artificial structures. Thus, half of the nest record cards for the British subspecies *yarrellii* referred to sites associated with buildings or other structures. These nests were usually in holes or crevices or on ledges of walls, bridges, locks or buildings, and most were up to 1·5 m from the ground, with 24% between 1·5 m and 3 m and the highest at 15·2 m. Only 9% were on the ground, compared with 96% of Yellow Wagtail nests.

Wagtails will often make use of the nest of another species. Grey Wagtails in Wales, for instance, frequently constructed their nest within or on top of an old domed nest of a White-throated Dipper, and also used the riverbank burrows of Collared Sand Martins (*Riparia riparia*), and almost 8% of 220 Grey Wagtail nests in Ireland were in or on dipper nests. Similarly, White Wagtails will also exploit nests of other species, notably those of Eurasian Blackbirds (*Turdus merula*), and they are known to use the holes of kingfishers, Collared Sand Martins and Common Redstarts (*Phoenicurus phoenicurus*) as breeding sites.

The typical motacillid nest is a deep grass cup lined with finer material, and usually concealed in vegetation, often at the base of a tussock, or hidden in a crevice. Dry grass is the favoured material, with varying amounts of moss, rootlets and leaves added. The nest of the Paddyfield Pipit may be partially domed, and that of the White-browed Wagtail can be quite a substantial structure. The Forest Wagtail, the only member of the family that regularly nests in trees, constructs a compact, firm cup of twigs, leaves, fine grasses and rootlets, all held together with moss and cobwebs, and draped with lichen to match its surroundings. The lining is of horsehair, wool, fur or moss roots.

From the limited information available, it appears that the precise site for the nest is chosen by the female, as has been found to be the case with both the Meadow Pipit and the Yellow Wagtail.

Nothing is known about the roles played by the sexes of the Mekong Wagtail in nest-building. For all other wagtails, however, it appears that both sexes take part in the collecting of nest mate-

rial and the building of the nest. The amount of work contributed by each sex varies from one species to another. In the case of the Yellow Wagtail, it is mainly the female that carries out the work, and it is reported that the nest of the Citrine Wagtail is built by the female. The female Forest Wagtail is accompanied by her mate in the nest-construction process, but she builds the nest entirely on her own, with no assistance from the male. Nevertheless, variation is evident among different pairs of a species. The male White Wagtail may build the whole nest on his own or he may build part of it; often, he starts the nest and the female finishes it. Various studies of the Grey Wagtail have revealed that both sexes collect grass and moss, and both incorporate this material into the nest. At one site in Wales, the female carried 46 beakfuls of material to the nest in one hour, compared with the male's 17 beakfuls.

Among the pipits, the male often accompanies the female as she builds, or he brings material to her and she incorporates this into the nest. Thus, the female Berthelot's Pipit builds the nest. In the case of the Red-throated Pipit, the male starts the nest, creating a hollow in moss, but the female then carries out the building work, using material brought in by both herself and her mate and, in the latter stages, by her mate alone. Similarly, the male Water Pipit collects material but it is the female that constructs the nest. Few data exist for longclaws, but observations indicate that the females of the Rosy-breasted and Grimwood's Longclaws build, with the males in attendance.

When a second brood is to be raised, the pair either will simply renovate and reline the nest or will build a new one as soon as young from the first brood fledge. Reuse of nest-sites is probably rare among ground-nesting species, but Grey Wagtails frequently reuse nests in walls or under bridges. One nest in the New Forest, in southern England, was used for three consecutive broods in one season. The Cape Wagtail, too, sometimes reuses its nest for a second brood, and there is one record of the same nest being used six times.

The eggs of most motacillids are generally buffy or creamy, sometimes greenish, with dark brown or reddish-brown mottles or speckling. Clutch size ranges from three to seven eggs, but is usually 4-6 in temperate regions. It is lower in the tropics, where a clutch of 2-3 eggs is normal. Bird species in the Northern Hemisphere often lay larger clutches at higher latitudes, where the longer days in summer enable them to forage for longer periods and, consequently, to raise larger broods. In North America, for example, Buff-bellied Pipits breeding at latitudes between 35° and 45° N have a mean clutch size of 4·7 eggs, whereas the figure for those at 65°-75° N is 5·5. Similarly, the mean clutch size of Meadow Pipits in Europe ranged from 4·6 eggs in Germany to 5·4 in south Norway and 5·7 in north Norway, and that of Grey Wagtails was about 5 in Wales, 5·2 in Scotland, about 5·3 in Germany, the Czech Republic and Switzerland, 5·5 in Denmark and 5·8 in Sweden. Grey Wagtails in Ireland laid smaller clutches than those in England and Wales.

For the Yellow Wagtail, various studies demonstrated an increase in clutch size by one egg for each 19° of latitude throughout Europe. At any given latitude, however, larger clutches were laid in western Europe than in eastern Europe. There was evidence for a reversed latitudinal cline also in eastern Asia, where clutch size is smaller at higher latitudes and smaller than at equivalent latitudes in Europe. C. P. Bell postulated that Yellow Wagtail populations that spend the non-breeding season in East Africa and South-east Asia laid smaller clutches than did those wintering in West Africa and India. He thought that this was because higher winter mortality among the latter populations could reduce breeding density, thereby leading to less competition for resources and allowing the production of larger clutches. Within Britain, one observer found little evidence for an effect of latitude or altitude on clutch size of Meadow Pipits, although another researcher found that average clutch size decreased with altitude, from 4·5 eggs near sea-level to less than 4·1 eggs above 333 m. Clutch size is also influenced by the availability of food before the start of laying.

Clutch sizes sometimes decline through the season, as has been found in some studies of White Wagtails. More commonly, however, they increase until the early or middle part of the summer, and decrease thereafter. Five is the most frequent clutch size for first-brood Tree Pipits, whereas four is the most frequent size of second clutches. In Wales, Grey Wagtail clutches laid in May were larger than those in April or June. Some observers have noted that second clutches of this species are larger than first clutches, which is not at odds with the Welsh results, but in the Czech Republic a steady decline in clutch size occurred as the season progressed. Differences in food availability through the season at different localities may help to explain these contrasting results.



Like the larks (Alaudidae), many pipits, wagtails and longclaws perform flight displays. This shared tendency is presumably an adaptation to open-country environments where prominent perches are in short supply. Some pipits attain great heights during song flights, and may sing continuously for up to an hour in flight. The display of the ***Red-throated Pipit*** *is typical of the smaller* Anthus *species: it rises obliquely, on fluttering wings, till it reaches a height of about 20 m, then it parachutes down with wings uplifted, singing loudly, until it plummets the last few metres to earth, whereupon it falls silent. A variant involves a more level fluttering song flight, sometimes over a distance of some 50 m, before the bird drops down.*

[*Anthus cervinus*, Lapland, Finland. Photo: Tomi Muukkonen]



*The "true" wagtails regularly enact distinctive displays. In the **African Pied Wagtail**, one individual often bends forward, cocking the tail almost vertically and shuffling the wings. Another individual may stand tall, with tail held low and bill tilted skywards. The general pattern of displays seems relatively constant across the genus. Their function, however, is unclear; they may work as an appeasement display between rivals, or a pre-copulatory ritual, and they sometimes occur between pair-members as a greeting near the nest.*

[*Motacilla aguimp*, Kruger National Park, South Africa. Photos: Patricio Robles Gil/ Sierra Madre]

Very occasionally, nests have been found to contain an exceptionally large number of eggs, but this is probably the result of two females laying in the same nest. This was the case with a Grey Wagtail nest that held eleven eggs.

Among those species for which data are available, laying takes place early in the morning, at daily intervals. Incubation begins with the last egg in the case of the Tawny Pipit and the Yellow and Grey Wagtails. Water Pipits and sometimes Meadow Pipits, however, start to incubate when the penultimate egg is laid. With Olive-backed and Red-throated Pipits, incubation may start after the second or third egg; hatching is then asynchronous, spread over two days. In addition, a Grey Wagtail has sometimes been seen to roost on the nest before the clutch is complete, and there is one record of this species starting to incubate before the full clutch had been laid.

The incubation period is usually 11-14 days, occasionally a day or two longer. It may be shorter as the season progresses. For all species of wagtail that have been studied, both the male and the female incubate the eggs, although in many cases the female takes the larger share, may sit for longer periods and usually incubates at night. Observations made on the Grey Wagtail reveal that the eggs are only rarely left unattended; each sex sits for bouts of 20-90 minutes, the female often for the longer periods. Female Yellow Wagtails incubate for 67% of the time and males only 17%, the nest being unattended during the rest of the time. Change-overs at the nest are unobtrusive. The sitting bird slips off quietly, calling only when some distance away. Its mate then approaches, carefully and slowly, frequently halting to look around, and then flies quietly to the nest.

Observations at nests of the Forest Wagtail indicate that incubation is by the female alone. Among pipits, too, incubation is reputedly carried out by the female in the case of the Buff-bellied, Sprague's, Red-throated, Tree and Water Pipits. The male brings food to his incubating partner. In observations of breeding Water Pipits, the female has been found to incubate for an average of 45 minutes per hour, and to spend the rest in perching or foraging away from the nest. In severe weather she spends less time away from the nest, but when food became scarce the females had to spend more time in foraging and less in incubating. There are few data on the roles of the sexes among longclaws, but it is reported that the females of the Yellow-throated and Rosy-breasted Longclaws undertake all or most of the incubation.

Once the eggs have hatched, the chicks are closely brooded by both parents. The female usually takes a larger share in the brooding of small young, and it appears that she alone broods at night. The female's stints also tend to be longer than those of the male. In all motacillids studied, both parents feed the chicks and both also remove faecal sacs. In the early stages, the sacs are removed directly from the young chicks and then swallowed. Later, they are taken from the edge of the nest and dropped some distance away; riverine species often drop the sacs into the water near the nest. The nestling period, from the time of hatching to the time when the young leave the nest, is generally 11-14 days, but sometimes, as in the case of the Mountain Wagtail, up to 16 or 17 days. Calculation of an exact period is complicated by the fact that some chicks of ground-nesting species may leave the nest prematurely if they are disturbed.

Normally, for almost all motacillid species studied, both sexes accompany the juveniles for two or more weeks, and sometimes up to eight weeks. It has been reported that, at least occasionally, the female Cape Wagtail alone cares for the juveniles, for 20-25 days. When a second brood is to be attempted, and the female lays again soon after the first brood has left the nest, one of the adults then cares for the fledged young while the other is incubating. Among those species in which only the female incubates, the male will look after the needs of the juveniles while his partner incubates the next clutch. The parents will often tolerate the nearby presence of their offspring for nearly nine weeks, although final broods of the season are tolerated for longer periods than are earlier ones. Once they reach independence, the siblings of a brood often remain together as a group for months after fledging, even migrating together.

Species nesting at high latitudes or at high elevations, where the breeding season is short, are single-brooded. Elsewhere, they usually rear two and occasionally three broods in a season. In tropical and subtropical regions, some motacillids, such as the African Pied and Cape Wagtails, may breed almost continuously through the year. Cape Wagtails can raise four to six broods in a single season, and one pair had eight nests and laid 24 or 25 eggs between September 1947 and August 1948, while another laid 50 eggs in 15 clutches over 48 months, rearing 29 fledglings. Intervals between broods vary greatly, and can be up to three weeks, but generally a few days to one or two weeks may elapse between the fledging of one brood and the laying of the next clutch. White Wagtails in Britain were found to have an average interval of 12 days between the two events. In one case, when a Grey Wagtail pair produced three successful broods, there was only one day between the fledging of the second brood and the commencement of the third.

Occasionally, the presence of helpers at the nest has been recorded. In one instance, a Cape Wagtail, possibly a youngster from an earlier brood, took turns with the breeding adults in the



All motacillids are essentially monogamous and territorial. They build a shallow cup of coarse dry grass, lined with rootlets, fibre and hair. This structure is usually placed in a depression, often concealed under a tussock, a rock or the edge of a small shrub. This ***Grassveld Pipit*** *is probably a female, given that males of most motacillids contribute very little to the actual nest building. They do tend to accompany the female throughout this period, although this has little to do with companionship and assistance, and a lot to do with mate-guarding and the evolutionary influence of sperm competition.*

[*Anthus cinnamomeus rufuloides*,
Tala Game Reserve,
KwaZulu-Natal,
South Aftica.
Photo: HPH Photography/
Photo Access]

incubation of the eggs. Similarly, a juvenile Madagascar Wagtail assisted its parents in the rearing of a second brood; as soon as the second clutch hatched, the juvenile joined its parents in feeding the nestlings. There is also a record of nestling Meadow Pipits being fed by a juvenile Meadow Pipit that was unrelated to the adult nest-owners.

When adults are feeding their young, they are sometimes stimulated to feed chicks of other species. There are several records of Grey Wagtails feeding dipper chicks. One such case involved a pair of these wagtails that fed both its own nestlings and those in a nearby White-throated Dipper nest over an eight-day period; the calls and begging behaviour of the dipper nestlings may have elicited this response. Likewise, a Tree Pipit was observed to feed Eurasian Skylark (*Alauda arvensis*) chicks in a nest close to its own. Conversely, a Wood Warbler has been seen to feed a young Tree Pipit. There are also documented cases of White Wagtails provisioning the fledged young of Common Redstarts and of a Yellow Wagtail feeding a juvenile Crested Lark (*Galerida cristata*). On the other hand, other species, such as the Eurasian Blackbird, sometimes "foster" wagtail young.

If a predator or intruder approaches an occupied nest or recently fledged young, the adult may perform a distraction display. The usual nature of this is that the adult drops down from the nest or flies out from it, and flutters to the ground, where it runs or flutters low, while calling, in an attempt to lead the intruder away from the nest. When this is successful, the bird then flies away. Sometimes, as it flutters, it drags a wing along the ground, as if injured. Such injury-feigning has commonly been recorded for the Meadow, Tree and Paddyfield Pipits, the Grey, Yellow and Cape Wagtails and most of the longclaws. The Rosy-breasted Longclaw will perform a distraction display even when the potential danger is 100 m from the nest. It makes low flights, with the legs dangling, perches on bushes while calling, and flies again. Distraction displays are given in response to the presence of dogs and snakes, as well as to humans.

Hatching success among pipits and wagtails in Europe ranges from 64% to as high as 90%. Various studies have found that, of those eggs that hatch, 71-88% usually produce fledged young, giving an overall success rate of 51-60%. In individual cases, this latter rate may sometimes be higher, up to 67% or more, and sometimes lower. In studies in Britain, for example, 42% of Grey Wagtail eggs produced fledged young, compared with figures of 53% for White Wagtails and 51% for Yellow Wagtails. In Ireland, however, almost 56% of Grey Wagtail eggs produced fledged young, while breeding success in two areas of Germany was, respectively, 53%, with 3·4 young fledged per pair per year, and 63%, with 3·3 young per pair per nest, this last figure being very high. Grey Wagtails in Denmark produced an average of three young per pair per year. In south Sweden and the Netherlands, Tawny Pipits appear to fit in well with this general pattern, successfully hatching about 80-89% of their eggs and rearing 60-74% of the chicks.

Studies of the Red-throated Pipit in different breeding areas revealed great variation in the species' hatching and fledging rates. Hatching success was 68·5% in Finland but 83·4% in the Yamal Peninsula, on the north-west Russian coast, while fledging success was only 62·9% at the Finnish sites but as high as 91·8% in the Yamal Peninsula. At the opposite extreme of this species' range, in the Chukotsk Penisula, in far north-eastern Russia, another study showed an overall success rate of 60·6%.

In one study of Tree Pipits, it was estimated that a mean of 2·4 young fledged per clutch, with pairs producing an average of 3·6 young in a season. In Britain, the average productivity of Tree Pipit pairs has been found to be 3·35 young, compared with figures of 2·2 for Meadow Pipits and 2·5 for Rock Pipits. In tropical and subtropical regions, where longevity may be much higher than in northern climes, and where the clutch is smaller, breeding success is often considerably lower. In South Africa, for example, S. E. Piper found that only 28% of eggs of Mountain Wagtails at sites on the Palmiet River, in KwaZulu-Natal, produced fledged young, giving an average annual productivity per pair of only 1·7-1·9 young. On the other hand, the annual adult survival rate was 95%, very much higher than that found for the Grey Wagtail in Europe, where only just over half of adults survive to the following year. Relatively few other data are available from Africa: from 16 clutches, totalling 55 eggs, a pair of African Pied Wagtails in Kenya reared 39 fledglings; and, as already mentioned, over a two-year period a Cape Wagtail laid 50 eggs, which produced a total of 29 fledglings.

Nest failure can occur at any stage of the nesting cycle. White Wagtails breeding in Britain are more prone to failure at the egg stage, and in south-west Ireland more Grey Wagtail nests failed



*The **Woodland Pipit** is a poorly known species that was formerly treated as a race of Long-billed Pipit* (Anthus similis). *The two are morphologically similar and have similar songs. The main difference is ecological, this form preferring tall but open miombo-type woodland and its widespread relative preferring rocky and shrubby hillsides. Very few details are known about the breeding of the Woodland Pipit: the nest is a grass cup and the clutch normally consists of 2-3 eggs, but that is virtually the extent of published knowledge. This photo suggests that the nest can be tucked away under a tussock and almost overarched by a roof of grasses.*

[*Anthus nyassae frondicolus*, Marondera, Zimbabwe. Photo: Peter J. Ginn]

at the egg-laying and incubation stages than did so later. Conversely, more Yellow Wagtails were lost during the nestling stage. Predation of Yellow Wagtails was found to increase during the later part of the fledging period, presumably because the young are noisier and the adults make more frequent visits to the nest. Breeding success in general seems to be higher later in the season, possibly because cover is denser, prey is more abundant and predators have a wider availability of prey. Conversely, later nests of Japanese Wagtails were found to suffer more from predation than earlier ones.

One reason for nest failure is inclement weather. Cold spells and snow early in the season can cause chilling of eggs or chicks when these are left unattended. In addition, high water levels following heavy rain often lead to the flooding of nests and the drowning of chicks of riverine species. Heavy rain can also have an adverse effect on ground-nesting species. The trampling of ground nests by domestic stock and game is a significant cause of nest failure among many species, such as the Yellow Wagtail in Europe and the Grassveld Pipit in Africa. Further, agricultural operations such as ploughing, the spraying of herbicide or the cutting of silage will affect all those species nesting on arable land or pastures. Brood parasites and predators also take a toll.

Cuckoos (Cuculidae) and cowbirds (*Molothrus*) are brood parasites of many species of pipit and wagtail, but not, so far as is known, of longclaws. Two cuckoo species, the Red-chested Cuckoo (*Cuculus solitarius*) of Africa and the widespread Common Cuckoo (*C. canorus*), concentrate on nests of motacillids. The Red-chested Cuckoo has two main host species, one of which is the Cape Wagtail. The Common Cuckoo has a number of hosts, but at elevations above 140 m it favours Meadow Pipit nests, while Tree Pipits and White Wagtails are also frequent hosts at lower altitudes. In Britain, up to 2% of Meadow Pipit nests and 4·5% of White Wagtail nests are parasitized by this cuckoo. Although Tree Pipits are parasitized infrequently in Britain, they appear to be more common hosts elsewhere in Europe, as in Poland and Russia, where in one study cuckoos accounted for as many as 7·5% of nest failures. Rock and Tawny Pipits are rarely or occasionally hosts to the Common Cuckoo, and this is also the case with Grey and Yellow Wagtails. For example, of 1946 clutches of this cuckoo in Britain, only three came from a Grey Wagtail nest, and just one of more than 200 nests found in Wales contained a cuckoo chick. Locally, the incidence of parasitism may be higher. In one area of the Netherlands, 6·2% of Yellow Wagtail nests were parasitized.

Outside Europe, the Common Cuckoo lays its eggs in the nests of such species as the Red-throated, Richard's and Paddyfield Pipits and the Citrine Wagtail. In north-east India, the renowned ornithologist and oologist E. C. Stuart Baker found that 7% of pipit nests were parasitized by the south Asian subspecies of this cuckoo. Another cuculid, the Himalayan Cuckoo (*Cuculus saturatus*), is known to parasitize Rosy Pipits in south-eastern Asia. In Africa, several species of cuckoo may lay their eggs in a pipit or wagtail nest. M. K. Rowan reported that Cape Wagtail nests were parasitized by two species, the Red-chested Cuckoo and the Diederik Cuckoo (*Chrysococcyx caprius*). In southern Africa, where there are three well-established "gentes" of the Diederik Cuckoo that parasitize the three commonest ploceids, each gens lays distinctive eggs; R. A. C. Jensen and C. J. Vernon thought that Cape Wagtails might be shown to be parasitized by a further well-defined gens. The nests of African Pied Wagtails, too, are parasitized by those same two species, as well as by a third, the Jacobin Cuckoo (*Clamator jacobinus*), and there is a record of a pair of African Pied Wagtails in Somalia fostering a young Klaas's Cuckoo (*Chrysococcyx klaas*). One Mountain Wagtail nest near Pietermaritzburg, in KwaZulu-Natal, was found to contain a Red-chested Cuckoo nestling, and this wagtail has also been recorded as a host of the Red-chested Cuckoo in East Africa. Finally, in North America, Sprague's Pipit sometimes acts as host to Brown-headed Cowbirds (*Molothrus ater*).

Predation, by a wide range of mammals, other birds and reptiles, is a significant cause of nest failure among motacillids. Indeed, predation accounted for 34% of failures of Tree Pipits in one study area and almost 50% of nest losses of White Wagtails. The commonest predators include rats, mustelids, foxes (*Vulpes*), corvids, small raptors and snakes, as well as domestic and wild felids. Brown rats (*Rattus norvegicus*) and other rodents are frequent predators of eggs and nestlings of most species. On South Georgia, the presence of rats on the main island may explain why the only local breeding pipit nests mainly on offshore islets. Rats are common along waterways in many regions, and in parts of Europe rats and feral American minks (*Mustela vison*), which



*The "black-and-white wagtails" and the "riverine wagtails" tend not to nest on level grassy ground. This **Grey Wagtail**, for example, has built its home in a classic site, a ledge on a damp rock face. This species commonly nests on ledges, at various heights above ground, and always close to water. The proliferation of man-made structures, such as bridges, stone walls and buildings, has allowed it to thrive where natural rock-faces are absent. In some regions the majority of Grey Wagtail nests are associated with artificial structures. The nest itself is a bulky platform topped with a cup of coarse material, lined with finer fibres, such as grasses, rootlets and hair.*

[*Motacilla cinerea cinerea*, Mangfalltal, Germany. Photo: Günter Ziesler]

are now widespread on European rivers, are believed to be the major predators of Grey Wagtails and several other river-breeding species.

Mustelids, snakes and corvids are serious predators of many bird species, including the Motacillidae. Nests of Japanese Wagtails, for example, are preyed on by *Elaphe* snakes, Siberian weasels (*Mustela sibirica*) and two species of crow (*Corvus*), as well as by brown rats, Asian field voles (*Microtus montebelli*), feral and domestic cats and Bull-headed Shrikes (*Lanius bucephalus*). In one study of Water Pipits in Europe, 39% of nests were preyed on by stoats (*Mustela erminea*) and snakes, whereas in another study of these pipits, in the Alps, long-tailed weasels (*Mustela frenata*) and deer mice (*Pesomyscus maniculatus*) were responsible for heavy losses of both eggs and nestlings. Mustelids, including both weasels and martens (*Martes*), along with corvids, Western Marsh-harriers (*Circus aeruginosus*) and Eurasian Buzzards (*Buteo buteo*), have been identified as predators of Tawny Pipits, up to 40% of the young of which are lost soon after fledging in Sweden and the Netherlands. In the Afrotropics, African monitor lizards (*Varanus niloticus*), snakes and small ground predators all commonly take the eggs or chicks of African motacillids, as well as preying on juveniles and breeding adults.

Various birds of prey, especially sparrowhawks (*Accipiter*), small falcons (*Falco*), harriers and buzzards, may all take nestlings and juveniles, as well as adults. Across the northern parts of Europe, Merlins (*Falco columbarius*) often specialize on Meadow Pipits, which form up to 70-80% of the falcon's diet on moorland and 40-50% of its diet around farmland in lower areas. In a study in north-east England, Meadow Pipits made up 48% of all birds taken by Merlins. This small raptor captures more juvenile pipits as the season progresses. In South Africa, an Amur Falcon (*Falco amurensis*) was watched as it devoured a Cape Longclaw, but it was not certain whether the small raptor had killed the longclaw or found it dead. In southern Africa, the remains of Cape Wagtails have been found several times in pellets of Common Barn-owls (*Tyto alba*), but it seems very unlikely that this or any other other motacillid features significantly in the diet of owls.

Otherwise, domestic pets, particularly cats but also dogs, account for many bird deaths. In South Africa, for example, a dog killed a Cape Wagtail that had been ringed nearly 3 years previously.

There are few records of parasites, such as lice (Mallophaga), fleas (Siphonaptera) or ticks, on motacillids, but blood-sucking larvae of the muscoid fly *Passeromyia heterocheta* and lice have been found on Cape Wagtail chicks. Blowflies (Calliphoridae) occasionally contribute to nestling mortality. Adult wagtails, especially White, Grey and Cape Wagtails, frequently suffer from a bacterial infection known as "bumble foot", resulting in swollen tarsi and feet, the infected birds often losing toes; the African Pied Wagtail also suffers from foot diseases. A trematode (*Tanaisia gratiosa*) was also found in a Grey Wagtail in China, and a trypanosome has been discovered in Welsh Grey Wagtails.

Rather few data are available on the longevity of most motacillids. There are records of Mountain and Cape Wagtails in Africa reaching, respectively, 10 and 11 years of age, with adult survival rate of the former sometimes as high as 95%. In Eurasia, motacillids are perhaps less long-lived, with most adults living for only two to three years. Exceptionally, Grey Wagtails and Yellow Wagtails have reached the respective ages of 6 years and 8·5 years. Importantly, juvenile survival is often low. In a study in north-west France, for example, juvenile mortality among Rock Pipits was found to be over 68%, the majority of the fledglings not surviving for more than four weeks.

Among the better-studied motacillids, including several of the wagtails, individuals breed for the first time when in their second year. This probably applies to the majority of the family, at least in the temperate parts of the range, but little is known about many of the tropical species.

Movements

Some members of the Motacillidae are highly sedentary, others make altitudinal or short-distance movements at the end of the breeding season, and some are regular long-distance migrants. For example, the South Georgia Pipit spends its whole life on South Georgia and associated islands. Those Grey Wagtails and Berthelot's Pipits living on the eastern Atlantic islands of the Canaries, Madeira and the Azores are also sedentary, as are some



*Some **Grey Wagtail** nests are hidden amongst vegetation but others, like this one, are very open and readily visible. In ideal habitat, 20-40 pairs of this species might pack along a 10-km stretch of river, with nests appearing on riverside rock faces every few hundred metres. The allocation of roles to sexes during the breeding cycle is relatively egalitarian in this species. Unlike many pipits, the construction phase is not the sole responsibility of females: some males carry nesting material and incorporate it into the structure, though they tend to visit the nest at a lower rate than their partners. Both sexes also contribute to incubation, though again females contribute slightly more than males. Males also provision the nestlings, as this photograph shows. Moreover, both male and female are liable to feign injury when they are disturbed near the nest. Interestingly, European studies have shown that the diet of young birds changes as they grow. At first, adults bring them soft-skinned larvae of mayflies, stoneflies, caddis-flies and diptera, but when their offspring have grown a little stronger, they bring late-instar invertebrates with tougher chitinous exoskeletons. General prey size increases through the nestling period too. Age-related shifts in diet are predicted by common sense, and are often suspected in the field, but few studies have proven them to be the case. The idea that they may be enforced by shifts in prey availability is disproved by the fact that the same general sequence is followed in consecutive broods.*

[*Motacilla cinerea cinerea*, Lancashire, England. Photo: Martin B. Withers/ FLPA]

Neotropical and Afrotropical species, notably the longclaws. At the other extreme, many of the species nesting in the Arctic tundra or taiga zones, such as the Red-throated, Pechora and Olive-backed Pipits, and in grasslands of the Palearctic Region, move thousands of kilometres southwards after breeding, spending the northern winter in Africa and the southern parts of Asia.

Several species are sedentary in parts of their range, but are partially or entirely migratory in other parts. For example, Grey Wagtails nesting in southern Europe and Morocco are largely sedentary, whereas those in Britain are partial migrants. Many leave Scotland and northern England after breeding and head south and south-west for the winter months, while others in southern Britain, as well as in Ireland, may be sedentary, at least in some years. All Grey Wagtails breeding in Scandinavia and east Europe are migrants, moving south or south-west to escape the long harsh winters. Other motacillids, such as Water Pipits which breed in mountainous regions, may undertake altitudinal movements, moving down from nesting areas to the lowlands for the winter months and ascending again as the snow melts in the spring. Similarly, Grey Wagtails in the Alps, the Elburz Mountains of Iran and the High Atlas Mountains of Morocco descend to lowland areas in the autumn, and Meadow Pipits likewise move from the uplands to the lowlands for the winter, some migrating farther south. The Water Pipit is of further interest in that some of the population breeding in the mountains of central Europe regularly make post-breeding movements in a westerly or north-westerly direction, spending the months of October to March in central and southern Britain (see also Habitat).

Long-distance migrants breeding in the western Palearctic move almost entirely to Africa. Eastern Palearctic motacillids mirror their western counterparts, travelling well to the south in the autumn. Eastern populations of the Citrine Wagtail, for instance, fly south to as far as Indonesia and New Guinea. Blyth's Pipit, breeding in Mongolia and surrounding regions, winters mainly in the Indian Subcontinent, while Richard's Pipit also winters there, as well as south and east to Indonesia, the Philippines and New Guinea. The Forest Wagtail, although breeding farther south in eastern Asia, is also wholly migratory, spending the non-breeding season primarily in South-east Asia and the Greater Sundas.

In the Nearctic, both the Buff-bellied and Sprague's Pipits are migratory. After breeding, they head south to the southern parts of the USA and to Mexico. Some Buff-bellied Pipits remain during the winter as far north as the Canadian border in the west and New Jersey in the east, but almost all Sprague's Pipits, a scarcer species, spend the non-breeding period in Mexico. Reflecting their origins (see Systematics), the small populations of Yellow and White Wagtails and Red-throated Pipits nesting in Alaska migrate back to the Old World, where they winter in eastern Asia south of Siberia. A few individuals of these species are occasionally recorded on the western seaboard of the USA.

Afrotropical motacillids are mainly sedentary, but some, such as the Cape Wagtail in South Africa, are partial migrants. The Golden Pipit is thought perhaps to make longer movements, as vagrants have been found far to the south of the normal range, and also to the north, in Oman. In addition, southern populations of the Grassveld Pipit, those breeding in Namibia, Botswana and South Africa, migrate to the east and north in the non-breeding season. Similarly, Mountain Pipits leave the Drakensberg Mountains, in the Eastern Cape, in March and return in October, hav-



*The **Forest Wagtail** is the most arboreal member of the family. It spends much of its time feeding on the ground underneath leafy canopies and, unlike all other motacillids, it habitually nests in trees. The nest itself is also unique; it is a small compact cup of leaves, twigs, fine grasses, and rootlets, bound together with moss and cobwebs. The outer layer is often interwoven with lichen or other natural material to provide camouflage. The usual nest-site is some 2-7 m above the ground, either balanced on a horizontal branch or lodged in an upright fork, often in quite open situations.*

[*Dendronanthus indicus*, Bikin River, Ussuriland, Russian Far East. Photo: Yuri Shibnev]



*In pipits, like the **Rock Pipit**, all incubation is undertaken by the female. Even after the eggs have hatched, she continues to brood and the male brings her food. Only when the chicks are a few days older do both parents share the role of provisioning. Female pipits are canny customers and their nests are difficult to find. They rarely land directly beside the clutch, and they often run some distance before flushing. Their circumspection makes sense in the light of the high predation pressure faced by most ground-nesting birds.*

[*Anthus petrosus littoralis*, Sweden. Photo: Victor Hasselblad/ VIREO]

ing probably spent the intervening months in areas north to north-west Zambia and southern DRCongo, and presumed migrants of this species occur also in Namibia, Botswana and Northern Cape Province. As in Europe and Asia, altitudinal movements are performed by some populations breeding at higher elevations, particularly by such species as the Short-tailed and Yellow-breasted Pipits and the Cape Longclaw in southern Africa. In several cases, motacillids may move away from very dry areas seasonally, as typified by the Golden Pipit and Sharpe's and Pangani Longclaws. Interestingly, some populations of the Short-tailed Pipit are present during or near the rains at latitudes between 4° S and 16° S mainly from September to March, and in central Africa from May to August, but this latter period coincides with the dry season in north-east Rwanda. Observations suggest that some movements in the Afrotropics, such as those made by certain populations of African Pied Wagtails and Plain-backed and Buffy Pipits, are probably nomadic or opportunistic.

Most motacillids migrate in flocks, in which family groups sometimes remain together. Wagtails and pipits have been described variously as either nocturnal migrants or diurnal migrants, but most migrate both by day and by night. In America, Sprague's Pipit is thought to migrate only by day, as its characteristic call has never been heard during the night. In Britain, flocks of Grey Wagtails are commonly seen in the daytime during the autumn, particularly in early September, off the south coast of Wales and south-east England, with some individuals heading out to sea. Peak movements occur mainly at the onset of anticyclonic conditions. A smaller spring passage is also evident. Small flocks of this species regularly cross the Mediterranean Sea at the Strait of Gibraltar, or fly across the Bosporus, in north-west Turkey. One observer at the latter station counted 285 Grey Wagtails as they passed eastwards by day between mid-August and late October, with passage reaching a peak at the end of September and early October. For birds moving down into north-east and eastern Africa, the Nile Valley and the Red Sea coasts are major flyways, but many others do migrate across the Sahara Desert.

Wagtails also migrate at night, as some appear at the lights of lighthouses. Through the Sahara and the deserts of the Middle East the Grey Wagtail is mainly a nocturnal migrant, but it stops off at oases during the night or during the day. Consideration of energetics suggests that Yellow Wagtails migrate non-stop over the Sahara, rather than making a series of short flights with resting stops, although adverse conditions can force them to make stopovers. Premigratory fattening in trans-Saharan migrants is well documented. It has been shown that Yellow Wagtails put on 30-40% of the body weight in fat before setting out on the return spring migration from north-east Nigeria to cross the Sahara Desert. The initial desert crossing is covered at a faster pace when compared with the later stages of the journey. The wagtails generally use the most direct routes between the breeding and non-breeding areas.

Yellow Wagtails time their departure from their African wintering quarters in accordance with the onset of spring in their breeding areas, rather than in response to rainfall in Africa. It has been suggested that moult, fattening and emigration are probably endogenously controlled, but competition from resident African birds may also be an important factor affecting the timing of migration.

Fidelity to a home area, or *Ortstreue*, is a widespread phenomenon among passerines. It can refer either to the previous breeding area or to a wintering area, or to both. A high degree of site-fidelity is exhibited by adult Meadow Pipits with regard to their breeding territories. While adults are site-faithful, returning constantly to the same breeding and non-breeding locations, younger birds are less faithful to the natal site. Although young Meadow Pipits usually return to an area near to the site where they were reared, they do sometimes move to localities up to 100 km away. In Malta, Grey Wagtails returned year after year to the same wintering area, one individual for four successive winters. There are many similar examples.

Few migrants among the Motacillidae reach Australia, although the Yellow, Citrine and Grey Wagtails occur there rarely. In western Europe, however, several eastern pipits are fairly regular vagrants in small numbers. These include the Olive-backed and Pechora Pipits and, more recently, Blyth's Pipit. Moreover, Richard's Pipit is a regular visitor in many European countries, and up to about 50 are recorded annually in Britain and Ireland. A small wintering population of these species is also present in the Middle East.

Relationship with Man

African Pied Wagtails, at least in part of their range, and both White and Japanese Wagtails have a close relationship with man,



*In the **Long-billed Pipit**, incubation lasts 13-14 days, and fledging another 13-14 days. The female works alone during the first phase, but both sexes contribute in tandem for the second, as seen here. The habitat shown is typical for this species, which often nests in the shelter of a tussock or rock on boulder-strewn slopes covered in xerophytic vegetation. Morphologically, the Long-billed Pipit is difficult to separate from the Grassveld Pipit* (Anthus cinnamomeus), *but the latter differs in display, voice and habitat, preferring grassy plains and meadows to rocky slopes.*

[*Anthus similis primarius*, Doornrivier, near Worcester, Western Cape, South Africa. Photo: J. J. Brooks/ Photo Access]

occurring in towns and villages, using buildings as nesting and roosting sites, and open lawns, roofs and other open spaces as foraging areas. For the large part, these birds are welcomed close to habitations. Trees planted in towns are popular roost-sites, as also are crops. Even boats and motor vehicles may be used as nest-sites, and so well liked are the wagtails that owners will give up using the vehicle while the birds complete their nesting; sometimes, the incubating wagtail will even tolerate car journeys.

On slow-moving rivers, the construction of weirs and mill-races and the building of canals and locks has enabled Grey Wagtails to spread into more lowland areas. Likewise, in the Canaries and the Azores, Grey Wagtails frequent wells and villages. In the Azores, any child caught harming a wagtail was punished, as the bird was linked to a religious belief.

In South Africa, the Cape Wagtail is regarded as a special, almost sacred bird, in close alliance with ancestral spirits. It is therefore not harassed. Any harm caused to a wagtail was thought to render the human responsible cattle-less. The wagtail was also believed to know and understand cattle; when feeding among them, it was said to be keeping a check on the number and condition of the stock. Few such beliefs exist in Europe, but wagtails are welcomed close to houses and are generally held in affection. The name applied to a wagtail in France, *bergeronette*, means "shepherdess" or "little maid"; thus, *Bergeronette des ruisseaux*, or the "shepherdess of the streams", clearly implies a fondness for the Grey Wagtail.

Few members of the family can be considered to be in any way a nuisance to man. They are, for the most part, small and unobtrusive birds, and it is difficult to imagine that any of the pipits could have any serious adverse impact on human interests. Wagtails often live in towns and villages, where they are generally left unmolested. Certain wagtail species, however, can at times cause problems. White Wagtails, on occasions when they gather to roost in commercial greenhouses in Europe, have been regarded as pests because of the damage that they do to crops. Similarly, large gatherings of roosting wagtails in trees in urban areas can occasionally become something of a nuisance to humans, because of the droppings deposited on the pavement below. On a minor scale, they can also cause local problems to householders, as when, for example, male Grey Wagtails repeatedly attack their reflections in windows. Many species also make a habit of regularly attacking car mirrors, attempting to drive away what they perceive as an intruder. This behaviour is widespread among White, Grey and Cape Wagtails.

Crops, especially irrigated crops such as rice, are much used by foraging motacillids, in particular by Yellow, Citrine and Grey Wagtails in Nepal and elsewhere. Further, Yellow Wagtails often nest in such crops as potatoes and cereals, this being a regular habit in some areas, as, for example, in the Lincolnshire fenlands of eastern England. These primarily insectivorous birds may be beneficial to the farmers in removing invertebrate pests.

Few motacillids are commonly kept in captivity, although some aviculturists do breed Grey Wagtails. One example of a fish-eating family of captive Grey Wagtails was mentioned earlier (see Food and Feeding).

Status and Conservation

As most pipits, wagtails and longclaws are open-country species, many of them have undoubtedly benefited from man's actions in clearing forests and woodland for agriculture. The New Guinea Pipit, for example, readily colonizes newly cleared areas, and the Yellowish Pipit in Brazil will move on to reclaimed land and fill-slopes with little vegetation. Arable and fallow fields and grasslands attract an array of pipits in Eurasia and Africa, and cattle attract large flocks of Yellow Wagtails during passage and in the non-breeding season. In some instances, overgrazing and regular burning may be inimical, but many pipits are drawn to recently burnt ground.

Few motacillids can be considered endangered, but some have very restricted ranges and, as such, are vulnerable to habitat changes. In 1994, only the Ochre-breasted Pipit of South America and the Yellow-breasted and Sokoke Pipits of Africa were listed as globally threatened, with a further six motacillids considered Near-threatened. In the most recent "official" publication on the conservation status of the world's avian species, however, five motacillids are classed as globally threatened, two of these being Endangered and three Vulnerable. The two Endangered species are both African: the Sokoke Pipit, found in a few coastal forests in East Africa, and Sharpe's Longclaw, lo-



*When a female **Grey Wagtail** approaches her nest, carrying an insect for her brood, she flies silently. This photograph captures the elegant lines of her body, the elongated tail and tertials to match. It cannot show, however, the fact that the flight of wagtails is one of their most distinctive features. All members of* Motacilla *fly strongly but with an exaggerated undulation; a burst of rapid wingbeats, followed by a curving dive, and so on. The larger pipits also bound in flight, but less dramatically. With her unique pattern of plumage and flight, a Grey Wagtail disappearing downstream is usually distinctive, especially coupled with the loud metallic "tchik" call, which is used freely away from the nest.*

[*Motacilla cinerea cinerea*, Navalmoral de la Sierra, Avila, Spain. Photo: Juan Manuel Hernández López]

cally distributed in montane grassland in the Kenyan Highlands. One of the three Vulnerable species is also African, the Yellow-breasted Pipit being confined to upland grasslands of South Africa and Lesotho. The other two are Sprague's Pipit, which breeds on prairie grasslands in North America, and the Ochre-breasted Pipit, restricted to *campos* grassland in eastern South America. A further four species are now placed in the Near-threatened category, because of their restricted ranges and apparent population declines or pressures on their grassland habitat. These are the Abyssinian Longclaw (*Macronyx flavicollis*) and the Nilgiri (*Anthus nilghiriensis*), South Georgia and Malindi Pipits. Finally, an additional two African species, the Long-tailed Pipit and Grimwood's Longclaw, are placed in the category of Data-deficient.

In South America, the Chaco Pipit, as well as the Ochre-breasted Pipit, was formerly considered to be under threat or



*The breeding system of longclaws seems extremely similar to that of other motacillids: incubation and nest-building is conducted mostly or solely by the female; nestlings and fledglings are tended by both parents for anything up to nine weeks after hatching. Here, we see proof of biparental care in the **Yellow-throated Longclaw**: the adult male is bringing a large insect for his brood. The chicks themselves, about a week old, have sprouted a dense mat of juvenile plumage, have lost many of their initial down feathers, and are no longer blind.*

[*Macronyx croceus vulturnus*, Marondera, Zimbabwe. Photo: Peter J. Ginn]



*Few motacillids breed at higher latitudes than the **Pechora Pipit**. It nests in shrub tundra and the broad, boggy valleys of Siberia, and its breeding season is thus delayed until the summer melt is in full swing. It lays clutches containing 4-5 eggs in late June or July; the short Arctic summer sometimes allows just enough time for two consecutive broods. In optimum habitat, breeding pairs are so tightly clustered that they have been considered to form loose colonies. The breeding range freezes over in winter and the Pechora Pipit is forced to migrate; the wintering grounds are poorly known, with most non-breeding records coming from eastern Indonesia.*

[*Anthus gustavi*, Russia. Photo: Yuri Artukhin/FLPA]

declining and, therefore, of high conservation priority. Further fieldwork by H. E. Casañas and colleagues, however, has shown that the Chaco Pipit is fairly common to common in its breeding area, in central Argentina. It migrates northwards up to Paraguay and northern Argentina, where it has been found in the provinces of Formosa, Chaco, Corrientes and Misiones. The Ochre-breasted Pipit has been downgraded from Endangered to Vulnerable, since recent surveys have found the species to be more common and widespread than was previously believed. Nevertheless, it is still threatened, especially in Brazil, where dramatic declines have occurred.

Grasslands are crucial to many motacillids, in particular the two *Hemimacronyx* species, namely the Yellow-breasted Pipit and Sharpe's Longclaw. More than 58% of the South African grassland biome was, however, irreversibly transformed between 1984 and 1990. The planting of alien trees on grasslands not only causes direct loss of habitat, but also fragments pockets of remaining grassland. Loss of grassland to afforestation is considered the main threat to the Yellow-breasted Pipit. It has been estimated that 50% of the species' population may be lost through commercial afforestation of grasslands if no conservation action is taken. In Lesotho, Yellow-breasted Pipits are rare and are known only from Sehlabethebe National Park, where several hundred have been recorded. The overly frequent burning of grasslands and overgrazing and trampling by small livestock, especially in Lesotho and the eastern parts of Eastern Cape Province, are also threats. Even though conservation of grassland is essential for its survival, less than 5% of this habitat is formally protected in South Africa.

Appropriate management of remaining grasslands is vital for species such as the Yellow-breasted Pipit and Sharpe's Longclaw. Grassland management practices on the Wakkerstoom high-altitude grasslands of South Africa have been shown to affect the nesting success of Yellow-breasted Pipits, through influencing the cover, height and density of vegetation. Nests in plots with low-intensity grazing and biannual burning had the highest success, and those in heavily grazed, annually burnt plots the lowest success, but nest density was highest in lightly grazed, annually burnt plots. Nest survival over the whole nesting period was lowest in heavily grazed, annually burnt plots, intermediate on lightly grazed, annually burnt plots, but highest in lightly grazed biannually burnt plots. In summary, the burning regime and the grazing intensity influence the amount, density and height of vegetation, nests being more successful with more vegetation cover, taller vegetation, higher vegetation density and lower heterogeneity. There is, therefore, a need to maintain low-intensity pastoral farming and to encourage appropriate management of grasslands.

The world population of the Yellow-breasted Pipit was estimated at 1500-5000 individuals in 1992, but the figure was increased to between 2500 and 6500 individuals in 2000. The species' habitat is highly fragmented, and further fragmentation would certainly be detrimental. Approximately 10% of the population is located within protected areas, mostly in the Natal Drakensberg National Park. The proposed grassland biosphere reserve in the area of Wakkerstroom is believed to hold up to 30% of the global population.

Sharpe's Longclaw, confined to Kenya, is also dependent on sympathetic grazing regimes. Its range is already small and fragmented, and there is concern about the continuing rate of habitat degradation and population decline. The species is found mainly on the Kinangop Plateau, Mau Narok and Uasin Gishu grasslands, and it has been recorded also on the eastern slopes of Mount Elgon, the grasslands of Nandi District and the northern drier slopes of Mount Kenya, but there are no recent records from the Aberdares. It is still locally common, as illustrated by the fact that a density of 40 birds/km^2 was recorded in 1996 on the Kinangop Plateau, but it requires tussocks and short grass. Land-use changes, especially cultivation, tree-planting and the removal of tussock species by ploughing, pose a serious threat to this restricted-range motacillid. The increasing human population results in smaller landholdings and higher stocking rates, rendering the grassland unsuitable for the longclaws.

Grassland management is critical for some other species, too, notably the globally threatened Sprague's and Ochre-breasted Pipits and Near-threatened species such as the Malindi Pipit. Sprague's Pipit was placed in the Vulnerable category because it has undergone a rapid population decline on its breed-

ing grounds in the North American prairies. Since 1970, its numbers have decreased by 4·7% annually. In the USA, the rate of decline reached a peak of 52% in a ten-year period in the 1960s and 1970s, but has fallen somewhat since then; in Canada, however, it has increased since 1975, to 8% per year. The main threat to the species is loss of prairie habitat, usually through conversion to seeded pasture, hayfields and cropland, and intensive grazing. The pipit shows a positive association with cover of standing dead vegetation less than 10 cm in height; the taller vegetation and the increased amount of bare ground found in non-native pasture probably make this less attractive to Sprague's Pipit. Since 1900, about 75% of the Canadian prairies have been converted for more intensive agriculture. Other threats include loss of, and degradation of, both breeding and wintering habitats. Overgrazing and burning can have an adverse impact on the habitat, and hay-cutting destroys nests; furthermore, burning damages the habitat in the first year, although, since it reduces the number of woody plants, it generally has positive impacts in later years. Sprague's Pipits need well-drained open grasslands with sparse to intermediate grass density and a moderate depth of litter. Encroachment into grasslands by shrubs and trees in the breeding and non-breeding areas may also be a local problem. In its wintering quarters in Mexico, Sprague's Pipit is under threat owing to fragmentation of grasslands through encroachment of woody vegetation, and widespread overgrazing. The illegal poisoning of prairie dogs (*Cynomys ludovicianus*) and the resultant degradation of their "towns" is also making some grassland inimical to species such as Sprague's Pipit. Although most of the prairie habitat is unprotected, large areas are in military reserves and national parks and on Prairie Farm Rehabilitation lands.

The habitat of the Ochre-breasted Pipit in Brazil has been heavily modified or altered, mostly since 1950. By 1992, some two-thirds of the *cerrado* region were no longer suitable for this species, having been subject to intensive grazing, invasion by other grasses, annual burning, or conversion to crops such as soybeans, eucalypts (*Eucalyptus*) and others. This pipit requires dry grassland or short grass in lightly grazed areas; it cannot tolerate annual burning. In Argentina and Paraguay, too, habitat modification, especially the conversion of natural grassland to eucalypt forest, is a significant threat. Flooding of habitats caused by the creation of new dams, such as that at Yacyretá, in Paraguay, is also of concern.

In an earlier South African publication, the Mountain, Yellow-tufted, Short-tailed and Yellow-breasted Pipits and the Rosy-breasted Longclaw were red-listed, as they were considered threatened or near-threatened. The Mountain Pipit, however, was removed from the *Eskom Red Data Book*, published in 2000, since current data suggest that it is not under any threat. The Long-tailed Pipit may be at risk, but so little is known about its population size and its movements that it is currently placed in the conservation category of Data-deficient.

In Europe, only one of 13 species of motacillid was considered regionally at risk by W. J. M. Hagemeijer and M. J. Blair, all others having a favourable conservation status and secure populations. The one species that had suffered marked declines since the mid-1960s, and was considered vulnerable, was the Tawny Pipit. It now occurs only in small isolated breeding sites in central Europe, although it is more common on inland sand dunes, clearings and open-cast mines on sandy soils. The reason for the decline was thought to be habitat loss caused by agricultural intensification, afforestation and scrub encroachment of open areas. The Tawny Pipit's strongholds in Europe are in Spain, Italy and Ukraine. Agricultural intensification of former low-intensity farming or steppe areas may well lead to further declines. In north-east Ukraine, however, Tawny Pipits appear to tolerate overgrazing, erosion, quarrying and the early stages of afforestation. In this area the species has two main breeding habitats, one of which is chalk grassland and the other sand dunes in river valleys. Transect counts in chalk grassland revealed that Tawny Pipit abundance was related mainly to two habitat parameters, namely the mean height of vegetation and vegetation cover. The pipits prefer short vegetation and sparse cover with areas of bare ground. Furthermore, there appears to be a negative correlation between the abundance of the Tawny Pipit and that of the Tree Pipit in places where the two overlap.

Because of its restricted distribution and sedentary nature, Berthelot's Pipit could appear to be at risk. Nevertheless, although it is confined to the Madeiras, the Selvagens and the Canaries, in the east Atlantic, it is a common bird on these islands. Historical reports indicate that it was always very numerous throughout its range. One ornithologist, when revisiting



*A brood of five is a common phenomenon in the **White Wagtail**. Given that so many hungry mouths compete to receive food from two overworked adults, it is not surprising that a signalling system has arisen. The gape of nestling wagtails is bright red, as it is in most passerines. The available evidence suggests that the tone of red is related to blood supply, and this in turn is related to hunger, such that the gape reddens the longer a chick goes unfed. Coupled with loud begging calls, the red gape of nestlings is a signal to (and target for) the visiting adults. In some species, such as longclaws, the red signal is accentuated with sharply contrasting white markings called guide spots.*

[*Motacilla alba alba*, Los Alcornocales Natural Park, Cádiz, Spain. Photo: Víctor M. Guimerá]



*These **Grey Wagtail** nestlings are very close to fledging, suggesting that they are about 11-13 days old. Once they leave the nest they will be tended by both parents for at least two weeks, unless the female quickly lays a second clutch, in which case the male will take sole responsibility for feeding the first brood. Repeat broods are usually laid 1-2 weeks after fledging, but some females begin their second clutch just one day after their first brood has fledged. On rare occasions, a youngster from the first brood will help its parents feed the second. In the temperate zone, both productivity and breeding success are surprisingly high in Grey Wagtails.*

[*Motacilla cinerea cinerea*, Biscay, Spain. Photo: José Luis Gómez de Francisco]

Gran Canaria in 1963, thought that the pipit had become less common there when compared with his impressions gained in 1908-1920. He attributed this perceived decline to the spread of artesian wells and tomato cultivation, with consequent widespread use of pesticides. Currently, the species is still common in suitable habitat on Madeira and in the Canaries, where, in 1990, ten breeding pairs were found in 2·7 ha on Lanzarote. Recent estimates are of 15,000-20,000 individuals in the Canaries, probably 50 breeding pairs on Selvagen Grande, and 500-1000 breeding pairs on Madeira. The population is considered stable and is not at present threatened, but future developments could impinge on its habitats.

Yellow Wagtails in Britain suffered a contraction of range between the 1960s and the early 1990s. Local declines were noted both there and in a dozen other countries in Europe, but elsewhere in the continent populations are stable or, as in Sweden



*In all motacillids studied thus far, both parents provide the nestlings with food and both remove faecal sacs. In the early stages, when nestlings are young and faecal material is small and soft, the sacs are removed and swallowed immediately. Later, when the sacs are bulkier and tougher, they are carried from the nest and dumped. Here we see that a nestling **Yellow-throated Longclaw** has just excreted faecal material, which the adult is about to dispose of elsewhere. By keeping the nest and its environs free of droppings, the parents maximize hygiene and minimize the likelihood of attracting the attention of predators.*

[*Macronyx croceus vulturnus*, Marondera, Zimbabwe. Photo: Peter J. Ginn]



Few land-use changes disrupt grassland ecology quite as much as afforestation, and indeed this is one of the major threats to India's only endemic motacillid, the ***Nilgiri Pipit****. The natural grasslands that once covered the slopes of the Nilgiri Hills, in the Western Ghats, are increasingly planted with* Eucalyptus, Acacia *and tea. The resultant habitat is unsuitable for this bird and its inclusion in the Near-threatened category is based on the consequent contraction of its effective range and numbers. Grassland frequently tends to be overlooked as a conservation issue, and it is vital that it be incorporated into networks of protected areas, in all relevant zones.*

[*Anthus nilghiriensis*, Eravikulam National Park, Kerala, India. Photo: Tim Loseby]

and Slovenia, increasing. In Britain, surveys on waterways suggested a decline in abundance of as much as 81%, and data from nest record cards indicated that the average brood size of this wagtail fell from 4·85 to 4·4 eggs over the 30-year period up to the year 2000. This decrease in brood size may partly explain the decline in numbers, but habitat changes may also be implicated. Agricultural intensification, involving heavy use of pesticides and loss of natural vegetation, leads to fewer insects and other invertebrates, and has been linked, as noted above, to declines in Tawny Pipit numbers in Europe. Despite this, high wagtail densities occur on intensively farmed arable land in the Netherlands. Yellow Wagtails and other wet-grassland or wetland-edge species are at risk, too, from the drainage or other loss of natural wetlands, although this has been partly offset by the creation of artificial sites, such as small farm dams, drinking-water reservoirs and sewage ponds.

Other wagtails, pipits and longclaws dependent on wet grassland in Eurasia, Africa or the Americas would clearly suffer if these habitats were lost or damaged, as through drainage and intensive crop production. In Zambia, for instance, drainage of dambos may be a local threat to Fülleborn's Longclaw. Similarly, wetland drainage is believed to be the reason for the contraction in range of Rosy-breasted Longclaws in South Africa.

Afforestation of open areas will, of course, have an adverse effect on grassland species. This has happened in India, where the planting of eucalypts, other trees or tea bushes on mountain grassland in the Kerala Hills has led to a reversal in the fortunes of the Nilgiri Pipit, which is now considered Near-theatened. Other species can suffer from the conversion of native woodland to conifer or gum plantations. In north-west Europe, for example, the planting of conifers on *Calluna* moorland causes declines in the numbers of Meadow Pipits. Planting may, however, benefit certain arboreal species such as the Tree Pipit, at least in the short term. Tree Pipits readily colonize new conifer plantations, but they usually abandon these after four or five years as the trees mature and the canopy closes; even so, they do use older plantations and the forest edges in some areas of north-west Europe. Coppicing of broadleaf woodland can also create temporarily suitable habitat for this species. Conversely, it seems probable that some forest-dwelling motacillids are adversely affected by deforestation. Nevertheless, there is no evidence that Forest Wagtails, which are dependent on trees in Asia, have undergone any decline.

Loss of riparian trees may have an impact on Grey and Mountain Wagtails through changing the nature of watercourses and, at the same time, affecting food supply. Ironically, Tree Pipits on their non-breeding grounds in Africa may have benefited from "low-key" forest clearance for crops. This small-scale clearance often leaves scattered trees, providing ideal habitat for this species.



Around 1·5 million years ago the ancestor of today's Correndera Pipit (Anthus correndera) *arrived on South Georgia. During subsequent millennia, evolution has given rise to a new endemic form, the* ***South Georgia Pipit****. Unfortunately, it is now classified as Near-threatened. Its population has crashed due to predation by brown rats* (Rattus norvegicus), *an introduced pest that tends to thrive on oceanic islands by devouring large numbers of eggs and nestlings. As a result, only 3000-4000 South Georgia Pipits survive, most of them confined to some 20 rat-free offshore islands.*

[*Anthus antarcticus*, Gold Harbour, South Georgia. Photo: Greg Lasley/VIREO]



*The **Abyssinian Longclaw** was once thought to be a common bird on the high plateaux and open grassland of Ethiopia. During recent surveys, however, it was found to be locally distributed and generally scarce, and its status has consequently been modified to Near-threatened. It seems likely to be under pressure from a growing human population, with the associated expansion of agriculture and increase in grazing pressure. Given the shortage of accurate information regarding its population and distribution further surveys are urgently required.*

[*Macronyx flavicollis*, Dinsho, Ethiopia. Photo: Dick Forsman]

One globally Endangered forest species that has undoubtedly suffered from habitat loss is the Sokoke Pipit. This localized motacillid has suffered greatly from human encroachment into the Kenyan and Tanzanian coastal forests. It is currently known to survive only in seven localities. The Arabuko-Sokoke Forest Reserve, in Kenya, is its main stronghold. The Tanzanian population is very low, the species being very rare at all known sites. Indeed, the Moa population is probably extinct, as none was found during a 1992 survey at Kilulu Hill, where only 2 km^2 of forest remain. Nor were any seen in Kazimzumbwi Forest Reserve, on the Pugu Hills, in 1990, but, as one was seen in October 1994, a few individuals may survive there; this reserve is separated from Pugu Forest by only a narrow strip of cleared land up to 1 km in width. In September 1989, two individuals were caught in the Kiono Forest Reserve, in north-east Tanzania. These were the first Sokoke Pipits recorded in the country since 1938, and their capture then increased the known localities of the species in East Africa to four. Two months later, two Sokoke Pipits were observed in Vikindu Forest Reserve, 17 km south of Dar es Salaam, and another was seen in Kiono Forest in March 1990. Although rare at both reserves, the species is the target of conservation efforts there. It has since been located also at Dondwe Forest Reserve, near Vikindu, and at Dar es Salaam.

Many coastal forests in East Africa have disappeared or become degraded through logging and encroachment for crops, grazing and firewood. Some forests in the Pugu Hills were cleared at the end of the 1970s, to make way for a brick factory and a kaolin mine, and only 10 km^2 of the original 22-km^2 Pugu Forest Reserve remained at the start of the 1980s. In the species' stronghold, in the Arabuko-Sokoke Forest, it occurs at densities of up to one pair per 2 ha in *Afzelia*-dominated forest, but at lower densities in thickets within degraded areas and in other wooded habitats. In 1979, it was estimated that the forest held 3000-5000 pairs of Sokoke Pipits; in 1984, the population was believed to be at least 2000 pairs. Recent studies in the *Brachystegia* areas of the forest revealed a density of 2·8 birds/ha in undisturbed forest, much higher than the 0·9/ha recorded in logged-over forest. Some 13,000 pipits were estimated to occur in the *Brachystegia* component, far more than had hitherto been thought, but the authors concluded that the existence of the Sokoke Pipit is probably compatible only with very limited forest exploitation.

Although an area of 400 km^2 of Arabuko-Sokoke may appear to be protected by its status of a forest reserve, logging and replanting with exotic species is not illegal. Some 43 km^2 are fully protected as a nature reserve, but legal regulations are often ignored. Encroachment by people and livestock also contributes to the further degradation of the habitat. Lack of funds for forest officers has been an added problem. There have been pressures to clear part of the Arabuko-Sokoke Forest for cultivation, but a presidential statement in 1998 reaffirmed the conservation status of the forest.



*Over the last century the grasslands of Brazil, Paraguay and Argentina have been heavily modified, and much of the original area is now no longer suitable for the **Ochre-breasted Pipit**. This species requires relatively dry natural grassland, and prefers a mosaic of burnt areas and short turf. This habitat has declined in extent and quality due to excessive grazing, burning and afforestation, and because it has been converted to crops such as soybeans and sugar cane. These changes in land use have caused a major decline in the range and population of this pipit, and it is now classed as Vulnerable.*

[*Anthus nattereri*, Serra da Canastra, Minas Gerais, Brazil. Photo: Edson Endrigo]

Sprague's Pipit *is the only member of the family with a breeding range restricted to North America. Unfortunately, it has declined rapidly owing to the conversion of native prairie to intensively farmed cropland: 70% of Canadian prairie has been lost since 1900, and the figures are not much prettier in the USA. Grassland in the wintering range is becoming increasingly fragmented, overgrown and overgrazed. Although a few populations are protected in military reservations and national parks, the species is Vulnerable to extinction and a concerted cross-boundary effort is required to safeguard its future.*

[*Anthus spragueii*, Kidder County, North Dakota, USA. Photo: Brian E. Small]

Pollution of rivers might be expected to have an adverse impact on the Grey and Mountain Wagtails, which obtain their prey partly from watercourses. In the UK, however, little evidence was found for any adverse effect of acidification on Grey Wagtails; in contrast to dippers, the catholic diet of the wagtails, coupled with opportunism, enables them to survive on acidic or otherwise polluted streams and rivers. S. J. Peris and co-workers also found that Grey Wagtails were poor bio-indicators of the chemical quality of Mediterranean watercourses.

Modification of rivers through dam-building, canalization and over-abstraction of water results in the loss of such habitat features as riffles, exposed rocks and overhanging trees, which, in turn, leads to large-scale losses of natural food resources. Wagtails that breed and feed in the riparian corridor are likely to suffer as a consequence. On the other hand, motacillids such as the White and African Pied Wagtails may actually benefit from the construction of reservoirs, as these provide a longer shoreline than that of the original watercourse. The latter species, however, appears to have declined in Egypt. Until the early twentieth century, it was regularly reported in small numbers along the River Nile northwards to the first cataract, near Aswan, where it was regarded as common, but the only recent report from Aswan was of a single individual in March 1980; there have been several recent records in the autumn, winter and spring from between Aswan and Wadi Halfa, in Sudan, and the species is probably a rare breeding resident along the shores of Lake Nasser. Several other motacillids, including the newly discovered Mekong Wagtail and the White-browed Wagtail, inhabit those lowland stretches where the river is braided and where there are numerous shingle shoals and sandbanks. Were these stretches of river to be submerged under new reservoirs, then populations of these species would suffer locally.

Another type of threat, more insidious, is the aerial spraying of chemicals. In Africa, Fenthion is used as a means of controlling Red-billed Queleas (*Quelea quelea*) when they are at roost in reedbeds and trees by water. Such habitats are used also by roosting White, Cape, Yellow and African Pied Wagtails. Tens of millions of queleas are killed each year by chemicals or by fuel explosions at roosts, but the effects of thee control methods on non-target species are very poorly documented. Crop-spraying, too, is a potential danger. One incident in southern Somalia involved the death of twelve Yellow Wagtails after a banana plantation was sprayed.



The damage that can be caused by the uncontrolled use of pesticides is well documented in the literature. In a further case, the potentially disastrous effect on Berthelot's Pipit of the use of rodenticide to protect nesting seabirds on Salvagen Grande was, fortunately, minimized by the undertaking of comprehensive pre-application studies.

Finally, one can only speculate about the impacts of climate change on the environment and on wildlife of all kinds. If drier conditions prevail farther north in Europe, for instance, then Mediterranean species such as the Tawny Pipit may extend or shift their ranges to the more northerly parts of that continent. Loss of tundra habitat as a result of ice melt, on the other hand, would have a serious impact on Red-throated and Pechora Pipits, perhaps even putting their very survival at risk. Conversely, milder winters in Europe would result in higher survival of such species as the Grey and White Wagtails, which sometimes suffer heavy losses in severe winters, as happened in 1962/63. Recent research suggests that Sprague's Pipit is one of the North American grassland species potentially most vulnerable to global warming. Models predict that this globally threatened pipit could possibly be extirpated from most of its current range in the USA and southern Canada. Similarly, global warming may have a negative impact on alpine breeding populations of the Buff-bellied Pipit in the Nearctic Region.

Sharpe's Longclaw *is endemic to Kenya, where it inhabits montane regions and Rift Valley escarpments. It requires damp grassland with short and tussocky turf, habitat characteristics favoured by low-intensity pastoral farming. It remains locally common on the Kinangop Plateau, and possibly elsewhere, but no population receives official protection, and fewer than 10,000 birds are thought to survive. Its numbers are being driven ever lower by detrimental land uses, foremost amongst which are afforestation, the expansion of agriculture, and the intensification of livestock grazing. These threats combine to place this taxon in the Endangered category.*

[*Hemimacronyx sharpei*, Kenya. Photo: Roland Seitre]



General Bibliography

Alström & Mild (2003), Alström & Ödeen (2002), Arctander *et al.* (1996), Badyaev & Hendricks (2001), Barker *et al.* (2001), Bennett & Peirce (1990), Bibby (1987), Bourne (2002), Christidis & Boles (1994), Clancey (1985a, 1990a), Cooper (1985), Davies (1977, 1985), Feldman & Feldman (1978), Flousek (1986), Foggo *et al.* (1997), Fraser (2003), Friedmann (1946), Glue & Morgan (1972), Grindley *et al.* (1973), Hall (1961), Herman & Holinsky (1970), Hopcroft (1995), Hua *et al.* (1978), Irwin (1960), Knox (1988), Lack (1963), Leonovich *et al.* (1997), Maclean & Maclean (1993), Møller (1986), Nakamura *et al.* (1984), Nevill (1984b), Newton *et al.* (1978), Oatley (1988), Ödeen & Alström (2001), Ormerod & Tyler (1991), Ossiannilsson (1978), Pierce & Mead (1978), Rose (1982), Sangster, Hazevoet *et al.* (1999), Sangster, Knox *et al.* (2002), Seel (1973), Seel & Walton (1974), Sibley (1970), Sibley & Ahlquist (1981, 1985b, 1990), Sibley & Monroe (1990), Simms (1992), Smith (1968b), Stuart Baker (1942), Tree (1963a), Tyler & Ormerod (1991, 1994), Vaurie (1954a, 1959), Voelker (1999a, 1999b, 2002), Voelker & Edwards (1998), Ward & Zahavi (1973), Winterbottom (1959a, 1959b, 1961, 1964), Wyllie (1981).

PLATE 70


inches 4
cm 10
ssp australis
ssp exiguus
ssp novaeseelandiae
ssp rogersi
ssp aucklandicus
1
ssp steindachneri
ssp chathamensis
ssp richardi
ssp sinensis
2
ssp centralasiae
ssp rufulus
3
ssp waitei
ssp bocagei
ssp cinnamomeus
4
ssp itombwensis
ssp grotei
ssp lynesi
ssp camaroonensis
ssp lacuum
ssp lichenya
5
6

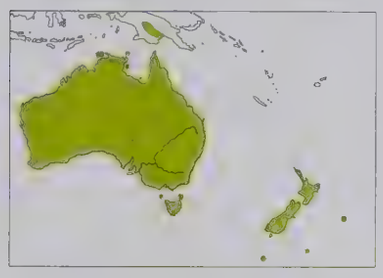
Genus *ANTHUS* Bechstein, 1805

1. Australasian Pipit

Anthus novaeseelandiae

French: Pipit austral **German**: Australspornpieper **Spanish**: Bisbita Neozelandés
Other common names: Common/New Zealand Pipit; Australian Pipit (Australian and New Guinea races)

Taxonomy. *Alauda novae Seelandiae* J. F. Gmelin, 1789, Queen Charlotte's Sound, South Island, New Zealand.
May form a superspecies with *A. richardi*, *A. rufulus* and *A. cinnamomeus*, and all were formerly treated as conspecific; recent DNA studies, however, do not support a close relationship between them. New Guinea and Australian races often considered to represent a separate species; also, recent evidence suggests that some populations on offshore islands may merit subspecific or even specific status. Described race *subaustralis* (from WC Western Australia) merged with *australis*; likewise, *reischeki* and *taupoensis* (both North Island, New Zealand) synonymized with nominate. Nine subspecies recognized.
Subspecies and Distribution.
A. n. exiguus Greenway, 1935 - EC New Guinea.
A. n. rogersi Mathews, 1913 - coastal NW Australia E to Cape York Peninsula.
A. n. bilbali Mathews, 1912 - SW Western Australia and SC South Australia.
A. n. australis Vieillot, 1818 - WC, C, E & SE Australia.
A. n. bistriatus (Swainson, 1838) - Tasmania, and islands in Bass Strait (King I, Flinders I).
A. n. novaeseelandiae (J. F. Gmelin, 1789) - New Zealand.
A. n. chathamensis Lorenz-Liburnau, 1902 - Chatham Is.
A. n. aucklandicus G. R. Gray, 1862 - Auckland Is.
A. n. steindachneri Reischek, 1889 - Antipodes Is.



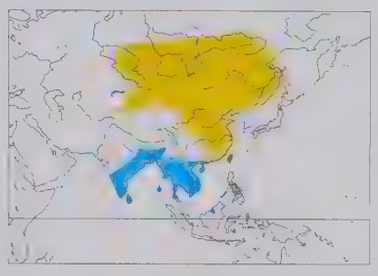
Descriptive notes. 17-18 cm. Large, well-built, slender-billed pipit with streaked underparts. Nominate race has narrow white supercilium, dark eyestripe faint in front of eye, broad and prominent behind eye, narrow dark moustachial and malar stripes, whitish submoustachial stripe; ear-coverts pale brown or fawn; fulvous-brown above, feathers with blackish centres and buff-cinnamon margins, giving streaked and mottled appearance, rump almost plain; remiges dark brown, edged fulvous, greater wing-coverts and inner secondaries broadly margined fulvous-white; tail brown, T5 with white outer web and distal half of inner web, T6 mostly white; white throat and foreneck; neck side and breast fulvous-white, mottled dark brown, abdomen, flanks and undertail-coverts white, flanks lightly streaked dark; iris dark brown; bill pale to dark brown, or horn, lower mandible with pinkish or horn base; legs pale pinkish-brown to yellowish-brown. Sexes alike. Juvenile resembles adult. Race *chathamensis* differs from nominate in having buffer feather edging and underparts; *aucklandicus* is more fulvous above and below, with almost no white on underparts, has bill stouter, supercilium obscure; *steindachneri* is more fulvous than previous, dark brown with light brown feather edging above, outer half of T5 and T6 cream, throat and breast cream with few brown streaks, abdomen light pinkish-brown; *rogersi* is small, with proportionately long tarsus, cold medium dun-brown above, remiges edged brownish-cream, breast heavily spotted blackish, spots may extend to upper belly; *exiguus* is similar to last, but with deeper and duller black markings; *bilbali* is large, with proportionately short tarsus, dull tawny-brown above, remiges edged brownish-cream with russet cast, inner rectrices edged tawny above, breast and belly deep cream, heavy breast streaking sometimes extending to upper belly and flanks; *australis* is medium to large, with proportionately short tarsus, dull tawny to sandy brown above, remiges edged brownish-cream, moderate to sparse streaking on breast rarely extending to flanks and upper belly; *bistriatus* is large, with proportionately long tarsus, deep tawny-brown above, remiges edged brownish-cream with russet cast, inner rectrices dusky with tawny edges, breast and belly cream, breast streaking rarely extending to belly and flanks. Voice. Song, in flight, a short descending trill or a quavering, trilled "tiz-wee-ir". Plaintive sharp "chirp" or "chirrup" call; also rendered as brisk splintered "pith" or rasping drawn-out "zwee" or "tsweeer".
Habitat. Any open, short grassland, as well as roadsides, coastal dunes and clearings in forest; often on man-modified grasslands, e.g. airstrips, gardens and playing fields. Quickly colonizes newly cleared areas.
Food and Feeding. Insects, small crabs and other invertebrate prey, and grass seeds. In 80% of 57 gizzards in one study, invertebrates comprised 90% or more of food by volume: c. 77% contained beetles (Coleoptera), 67% Hymenoptera (mostly ants), 63% flies (Diptera), 39% insect larvae, 25% insect pupae, 25% spiders (Araneae), 18% orthopterans, 14% lepidopterans and 12% bugs (Hemiptera); one feather louse (Mallophaga), one aquatic snail (Mollusca) and one isopod (Crustacea) also found. Also many seeds, of following plant families (in order of importance): clovers (Leguminosae), grasses (Gramineae), Compositae, Plantaginaceae, Cyperaceae, Polygonaceae, Labiatae, Cruciferae, Caryophyllaceae, Ranunculaceae, Rubiaceae. Forages on ground, picking food items from surface. In flocks of up to c. 60 in non-breeding season.
Breeding. Mainly Aug-Dec, but recorded in all months; may have 2-3 clutches per year. Sings in undulating display-flight. Nest a deep grass cup, lined with softer grass, built in sheltered depression, often on bank or slope. Clutch 2-5 eggs; incubation by female, male keeping watch, period c. 13 days; young fledge after c. 14 days.
Movements. Largely sedentary or locally nomadic, but some redistribution occurs between the summer and winter months. In Australia, only a non-breeding visitor in Kimberley area of N Western Australia. Flocks of up to 100 individuals recorded outside breeding season, suggesting local movements.
Status and Conservation. Not globally threatened. Generally common to very common. Very common in grasslands in W & SE Australia, where densities of 0·07-0·22 birds/ha recorded; particularly abundant on high plains of the Great Dividing Range; rather sparse through C & N Australia. Very common in Tasmania and in New Zealand. Has benefited generally from clearance of land for agriculture. In some parts of range may be considered locally as a nuisance; reported to damage vegetables in Australia.
Bibliography. Bailey & Sorensen (1962), Beauchamp (1995, 1998, 2002), Beehler *et al.* (1986), Blackburn (1968), Blakers *et al.* (1984), Britton (1984), Chambers (2000), Chan (2001), Christidis & Boles (1994), Clancey (1978c, 1984a, 1986a, 1990a), Coates (1990, 2001), Crawford (1972), Diamond (1972), Falla *et al.* (1981), Foggo (1984), Foggo *et al.* (1997), Frith (1969), Garrick (1981), Hall (1961), Hamel (1972), Heather & Robertson (1997), Holdaway (1988), Lindsay *et al.* (1959), Macdonald (1988), Merton (1970), Moeed (1975), Morcombe (2000), Nilsson *et al.* (1994), Oliver (1955), Pizzey & Doyle (1980), Prigogine (1982), Rand & Gilliard (1967), Robertson (1985), Schmid (1993), Schodde & Mason (1999), Simpson & Day (1998), Stidolph (1974), Stronach (1990b), Warham & Bell (1979), Watts (1999), Wilkins (1972).

2. Richard's Pipit

Anthus richardi

French: Pipit de Richard **German**: Spornpieper **Spanish**: Bisbita de Richard

Taxonomy. *Anthus Richardi* Vieillot, 1818, France.
May form a superspecies with *A. novaeseelandiae*, *A. rufulus* and *A. cinnamomeus*, and all were formerly treated as conspecific; recent DNA studies, however, do not support a close relationship between them. Race *ussuriensis* considered by some authors to be synonymous with *sinensis*. Five subspecies recognized.
Subspecies and Distribution.
A. r. richardi Vieillot, 1818 - breeds SW Siberia and NE Kazakhstan E to L Baikal; winters mainly SW Asia, some farther W.
A. r. dauricus H. C. Johansen, 1952 - breeds Transbaikalia and Yakutia E to Sea of Okhotsk and S to N Mongolia, Manchuria and NE China (NW Heilong-Jiang); winters S Asia.
A. r. centralasiae (Kistiakovsky, 1928) - breeds E Kazakhstan (Zaysan Basin, E Tien Shan) E to W & S Mongolia, S to N China (Xinjiang, Qinghai, Gansu, probably also Nei Mongol); winters S Asia.
A. r. ussuriensis H. C. Johansen, 1952 - breeds SE Russia (lower Amur area, Ussuriland) S to E China (S to Sichuan and R Yangtze), probably also Korea; winters SE Asia.
A. r. sinensis (Bonaparte, 1850) - SE China S of R Yangtze.



Descriptive notes. 17-18 cm; 21-40 g. Large pipit with long, stout legs, long toes, very long hind claw. Nominate race has long creamy to buff supercilium tapering at rear, pale cream-buff eyering and lores, occasionally darkish loral stripe; prominent dark malar stripe and patch, pale buff-brown patch on rear cheek; above, buff-brown to dun-brown, streaked blackish, lower back and rump less streaked; primaries, secondaries and primary coverts dark brown with narrow white edges, tertials and secondary wing-coverts tipped and edged rufous or buff, greater coverts paler with broad sandy-buff edges and tips, median coverts blackish-centred with broad buffish-white margins, lesser coverts sandy brown; tail blackish-brown, edges of T1 tinged rufous with broad buff-brown edging, T5 and T6 with outer web and much of distal inner web white; upper throat white, lower throat, breast and flanks deep buff, belly white, band of fine blackish streaks across breast and upper flanks; underwing-coverts and axillaries creamy buff to buff-grey; iris dark brown; upper mandible dark grey, lower mandible pale pink, sometimes yellowish; legs and toes pale pink or yellowish-pink, hind claw (14-22 mm) longer than hind toe. Sexes alike. Juvenile has unmarked pale lores, pale feather edges on upperparts giving scaly effect, two indistinct pale wingbars, is more sharply streaked below; pale edgings lost by first winter. Race *centralasiae* is paler than nominate, has less contrasting streaks on upperparts, yellower underparts; *dauricus* is similar to previous, but has less stout legs and shorter hind claw than nominate; *ussuriensis* is darker, greyer, and with darker streaks than last, is rather small, with relatively longer hind claw; *sinensis* is smallest, with relatively short tail and hind claw, breast and flanks more deeply tinged rufous, fainter streaks on mantle than previous. Voice. Song, usually in flight, "chewee-chewee-chewee" with much individual variation, 3-12 notes. Call a loud, harsh explosive "r-rump" or "schreep".
Habitat. Any open country, steppe grassland, paddyfields, stubble fields and cultivations, edges of reservoirs and marshy areas. Usually below 1800 m; in Himalayas, recorded on passage to 6300 m on Mt Everest.
Food and Feeding. Mainly adult and larval insects, notably beetles (Coleoptera) and grasshoppers (Orthoptera). Of 48 samples obtained in studies using neck-collars, 93·7% contained grasshoppers, 8% beetles, 6% hymenopterans, 6% spiders (Araneae). Of 149 items in further samples, 24% were caterpillars (Lepidoptera), 19·5% flies (Diptera), 16% beetles, 15% hymenopteran adults and larvae, 12% dragonflies (Odonata), 5% spiders, just over 1% each stoneflies (Plecoptera) and worms (Annelida), and less than 1% lacewings (Neuroptera) and homopteran bugs. In winter in Europe, a butterfly, an ichneumon wasp (Hymenoptera), a ladybird (Coccinellidae) and seed mix were eaten. Forages on the ground, picking terrestrial invertebrates. May associate with grazing livestock.
Breeding. Mainly Apr-Jul. Sings in descending display-flight. Nest a large cup of coarse grass and roots, lined with finer material such as grasses and hair, built on ground among grass tufts, often in a depression. Clutch 3-4 eggs, usually 3 in S of range; incubation and brood-feeding by both sexes, periods not documented.
Movements. Long-distance migrant; winters mostly in S parts of Asia E to Philippines and W New Guinea, and S to Sundas. Race *sinensis* probably remains mostly within SE China. Nominate race migrates mainly to Indian Subcontinent, but regular winterer also in S Europe (Atlantic coast, Mediterranean region), NW Africa and Middle East; peak numbers in latter regions in Dec-Feb, e.g. flocks of up to 29 in Spain, 33 in Italy (Sardinia) and 15 in Morocco; in Israel also regular passage migrant, with up to 420 recorded in autumn (mid-Sept to Dec), fewer in spring, suggesting that some migrate to E Africa. Observations in W Africa (Mali and around L Chad) also suggest possible wintering in that region. In addition, nominate race recorded as vagrant in most countries of W Europe, well to W of main breeding and wintering range. Some migrants of E races may reach N Australia.
Status and Conservation. Not globally threatened. Common throughout most of range; no evidence for any decline.

On following pages: 3. Paddyfield Pipit (*Anthus rufulus*); 4. Grassveld Pipit (*Anthus cinnamomeus*); 5. Mountain Pipit (*Anthus hoeschi*); 6. Jackson's Pipit (*Anthus latistriatus*).

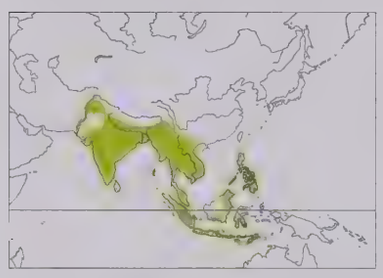
Bibliography. Alba (1981), Ali (1969), Ali & Ripley (1998), Ali *et al.* (1996), Carey *et al.* (2001), Clancey (1984a, 1986a, 1990a), Copete & Armada (2001), Cramp (1988), Deignan (1945), Delacour & Jabouille (1940), Dementiev *et al.* (1970), Duckworth & Hedges (1998), Duckworth *et al.* (1998), Dulau (1997), Eames & Ericson (1996), Eames *et al.* (2001), Étchécopar & Hüe (1964, 1983b), Frémont (2004), Grimmett *et al.* (1998), Grussu & Biondi (2004), Hall (1961), Hall & Moreau (1970), Handrinos & Akriotis (1997), Henry (1998), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Jennings (1995), Jordi & Lustenberger (1998), Livanov (1987), López, C. (1997, 1998), Ma Ming *et al.* (2000), Mauersberger *et al.* (1982), Maumary & Baudraz (2000), Melville (1996), Meyer de Schauensee (1984), Nation *et al.* (1997), Paz (1987), Pilcher *et al.* (1990), Preiswerk *et al.* (2001), Prigogine (1982), Rands *et al.* (1987), Ripley (1982), Roberts (1992), Robson (2000), Rogacheva (1992), Sangster *et al.* (1999), Smythies (1986, 1999), Snow & Perrins (1998), Stepanyan (1990, 1995), Stephan (1994), Thévenot *et al.* (2003), Verroken & Verroken (1993), Yang Guisheng & Xing Lianlian (2000), Zou Fasheng *et al.* (2000).

3. Paddyfield Pipit

Anthus rufulus

French: Pipit rousset **German**: Orientspornpieper **Spanish**: Bisbita Oriental
Other common names: Indian/Oriental Pipit

Taxonomy. *Anthus rufulus* Vieillot, 1818, Bengal, India.
May form a superspecies with *A. novaeseelandiae*, *A. richardi* and *A. cinnamomeus*, and all were formerly treated as conspecific; recent DNA studies, however, do not support a close relationship between them. Race *albidus* possibly indistinguishable from *medius*; also, birds from Lombok and Sumbawa (W Lesser Sundas) somewhat intermediate between former race and *malayensis*. N Sulawesi population of uncertain racial identity, tentatively included in *albidus*. Six subspecies recognized.
Subspecies and Distribution.
A. r. waitei Whistler, 1936 - NW Indian Subcontinent.
A. r. rufulus Vieillot, 1818 - most of Indian Subcontinent (except NW, N and extreme SW) E to S China, S to S Thailand and Indochina.
A. r. malayensis Eyton, 1839 - extreme SW India (Nilgiri Hills), Sri Lanka, Malay Peninsula, Sumatra, Java, N & SE Borneo and S Indochina.
A. r. lugubris (Walden, 1875) - Philippines; possibly also N Borneo.
A. r. albidus Stresemann, 1912 - Sulawesi, Bali and W Lesser Sundas (Lombok, Sumbawa, Komodo, Padar, Rinca, Flores, Sumba).
A. r. medius Wallace, 1864 - E Lesser Sundas (Sawu, Roti, Timor, Kisar, Leti, Moa, Sermata).



Descriptive notes. 15-16 cm; 17·4-22·7 g. Nominate race has long creamy to buff supercilium tapering at rear, pale lores (occasionally darkish loral stripe), dark submoustachial stripe, prominent dark malar stripe and patch; above, greyish-brown, streaked blackish, less streaked on back and rump; primaries, secondaries and primary coverts dark brown with narrow white edges, tertials and secondary wing-coverts tipped and edged rufous, greater coverts paler with broad sandy-buff edges and tips, median coverts with blackish centres and broad buff-white tips (forming wingbar), lesser coverts sandy brown; tail blackish-brown, edges of T1 tinged rufous, T5 and T6 with outer web and much of distal inner web white; upper throat white, lower throat, breast and flanks deep buff, belly white, band of fine blackish streaks across breast; underwing-coverts and axillaries creamy buff; iris dark brown; upper mandible dark grey, lower mandible pale pink, sometimes yellowish; legs pale pink or yellowish-pink, long hind claw (10-14 mm). Differs from very similar *A. richardi* in shorter legs, generally paler, greyer and less heavily streaked plumage, median coverts with dark centres more square-cut (less pointed) and margins paler and narrower. Sexes alike. Juvenile has unmarked pale lores, pale tawny feather edges on upperparts giving scaly effect, two indistinct pale wingbars, is more sharply streaked below; pale edgings lost by first winter. Race *waitei* is paler grey and less heavily streaked than nominate; *malayensis* is darkest, most heavily streaked; *albidus* is small, greyish above, whitish below; *medius* is like last but more buffy above, more ochraceous and less white below; *lugubris* has upperparts light buffy brown, streaked dark brown, underparts buffy white. Voice. Song, in flight, includes a wheezy trill or series of feeble "tseep" notes, on average higher-pitched and faster than those of *A. richardi*, with series of 5-20 "clink" notes during descent. Call a harsh explosive "chwist", or thin high-pitched "pipit" or "tseep tseep" or "chep", often repeated; alarm call at nest a feeble "tsip tsip tsip".
Habitat. Open country, short grassland, paddyfields, stubble fields and cultivations, also airfields, roadsides, wetland edges, savanna woodland. To 1000 m, exceptionally to 3000 m, in Pakistan and NW India (race *waitei*); *malayensis* occurs to 2100 m in Sri Lanka and to 1500 m in Sumatra, and in SW India (Nilgiri Hills) is largely replaced by *A. nilghiriensis* above 1800 m (some overlap). From sea-level to 2400 m in Wallacea.
Food and Feeding. Mainly adult and larval insects. Stomach contents included weevils (Curculionidae), ants (Hymenoptera), termites (Isoptera), bugs (Hemiptera), also spiders (Araneae); also weed seeds and vegetable matter. Forages on the ground, picking terrestrial invertebrates. Singly or in pairs, occasionally small groups.
Breeding. Mar-Jul, occasionally to Sept, in N Indian Subcontinent; mostly in Nov-Jun dry season elsewhere, in Sri Lanka Jan-Jul (peak Apr/May); lays in Apr-Jun in Sumatra, and breeds in Apr-Jun on Lombok, Sumbawa and Flores; birds with enlarged gonads in Oct in S Sulawesi; normally single-brooded. In song flight ascends in series of curves, before diving to the ground. Nest built by female as male keeps guard (*malayensis*), or by both sexes (nominate), a typical cup of grass and roots, lined with finer material, placed on ground among grass tufts, and often in depression (e.g. cattle footprint); may be partly domed, and have tunnel entrance 30-60 cm long. Clutch 3-4 eggs, usually 3 in S; incubation and brood-feeding by both sexes, incubation and fledging periods not documented; injury-feigning display reported. Nests parasitized by Common Cuckoo (*Cuculus canorus*).
Movements. Resident; some local and altitudinal movements. A summer visitor in the Himalayan foothills (race *waitei*).
Status and Conservation. Not globally threatened. Common throughout most of range; generally uncommon, locally more common, in Wallacea. No evidence for any decline in any region.

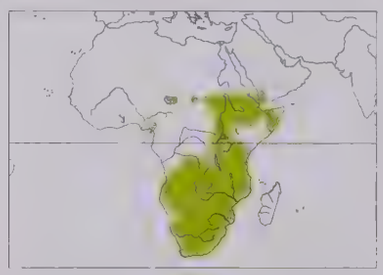
Bibliography. Ali (1969, 1996), Ali & Ripley (1998), Ali *et al.* (1996), Alström & Mild (2003), Andrew & Holmes (1990), Barua & Sharma (1999), Bruce (1987), Clancey (1984a, 1986a, 1990a), Coates & Bishop (1997), Danielsen *et al.* (1994), Deignan (1945), Delacour & Jabouille (1940), Duckworth *et al.* (1999), Eames & Ericson (1996), Eames & Robson (1992), Eames *et al.* (2001), Escott & Holmes (1980), Evans, Dutson & Brooks (1993), Evans, Magsalay *et al.* (1993), Glenister (1971), Grimmett *et al.* (1998), Hall (1961), Hellebrekers & Hoogerwerf (1967), Henry (1998), Inskipp & Inskipp (1991), Javed & Rahmani (1998), Jeyarajasingam & Pearson (1999), Johnstone & Jepson (1996), Johnstone *et al.* (1996), Jones *et al.* (1994), Kennedy *et al.* (2000), MacKinnon (1988), MacKinnon & Phillipps (1993), Madoc (1976), Majumdar & Brahmachari (1988), Majumdar *et al.* (1992), van Marle & Voous (1988), Medway & Wells (1976), Mees (1996), Meyer de Schauensee (1984), Mohan (1997), Mukherjee (1995), Ogilvie-Grant (1894), Pardo & Gogorza y González (1997), duPont (1971), Prigogine (1982), Rabor (1977), Riley (1938), Ripley (1982), Roberts (1992), Robson (2000), Smythies (1999), Sugathan & Varghese (1996), Watling (1983), White & Bruce (1986), Zheng Guangmei & Zhang Cizu (2002).

4. Grassveld Pipit

Anthus cinnamomeus

French: Pipit africain **German**: Zimtspornpieper **Spanish**: Bisbita Africano
Other common names: African/Grassland Pipit; Cameroon Pipit (*camaroonensis*)

Taxonomy. *Anthus cinnamomeus* Rüppell, 1840, Simien Mountains, north Ethiopia.
May form a superspecies with *A. novaeseelandiae*, *A. richardi* and *A. rufulus*, and all were formerly treated as conspecific; recent DNA studies, however, do not support a close relationship between them. Some research suggests that present species is more closely related to *A. similis*. Has been considered to include *A. latistriatus* as a race; conversely, *winterbottomi* sometimes treated as a race of latter or of *A. similis*, and has been synonymized with nominate race of *A. nyassae* by some authors. Race *camaroonensis* sometimes considered a separate species; described race *katangae* (from L Musole, in SE DRCongo) merged with *lichenya*. Fourteen subspecies recognized.
Subspecies and Distribution.
A. c. lynesi Bannerman & Bates, 1926 - SE Nigeria, Cameroon, W Chad and W Sudan.
A. c. camaroonensis Shelley, 1900 - W Cameroon (Mt Manenguba, Mt Cameroon).
A. c. stabilis Clancey, 1986 - C & SE Sudan.
A. c. cinnamomeus Rüppell, 1840 - W & SE Ethiopian Highlands.
A. c. eximius Clancey, 1986 - SW Arabia.
A. c. annae Meinertzhagen, 1921 - Eritrea, Djibouti, Somalia, SE Kenya and NE Tanzania.
A. c. itombwensis Prigogine, 1982 - highlands of E DRCongo.
A. c. lacuum Meinertzhagen, 1920 - SE Uganda, W & S Kenya and N & C Tanzania.
A. c. winterbottomi Clancey, 1985 - highlands of NE Zambia, N Malawi, S Tanzania and NW Mozambique.
A. c. lichenya Vincent, 1933 - NE Angola, S & E DRCongo, and from W Uganda S to N & E Zambia, C Malawi, adjacent NW Mozambique, and Zimbabwe plateau.
A. c. spurium Clancey, 1951 - SE Tanzania S to NE Namibia, Zambezi Valley and coastal lowlands of Mozambique.
A. c. bocagei Nicholson, 1884 - W & S Angola S to NW South Africa (Northern Cape).
A. c. grotei Niethammer, 1957 - N Namibia and N Botswana.
A. c. rufuloides Roberts, 1936 - South Africa (except NW), Swaziland and Lesotho lowlands.



Descriptive notes. 16-17 cm; 18-31g. Large, slim, long-legged and long-tailed, well-marked pipit. Nominate race has buff lores and broad supercilium, dark brown eyestripe, buffish ear-coverts with dark brown streaks, blackish malar stripe; upperparts rich cinnamon with strong blackish streaking, back and rump almost uniform; wing feathers black or blackish-brown, edged and tipped rich cinnamon, lesser wing-coverts buff-brown; tail dark brown, T5 with much white on outer web, T6 with outer web and much of inner web buff-tinged white; underparts buff or tawny, paler on throat and centre of belly, deeper buff on breast and flanks, distinct short blackish streaks on upper breast; underwing-coverts and axillaries buff; iris dark brown; bill blackish-brown, yellowish base of lower mandible; legs pinkish-flesh, hind claw longer than hind toe. Distinguished from *A. similis*, *A. nyassae* and *A. hoeschi* by slightly smaller size, smaller bill, somewhat paler plumage, whiter colour on outer tail feathers. Sexes alike. Juvenile is more heavily streaked dorsally, has sharp white edges of tertials and greater and median coverts, pink base of bill. Racial differences mostly slight: *lynesi* is larger than other races, darker than most, with heavier, blacker streaking above, contrasting cinnamon-buff edgings of wing feathers, deeper cinnamon-buff below, broader larger black streaks confined to upper breast; *camaroonensis* resembles last but is less cinnamon, more buff, below, with pale buff edgings of wing feathers; *annae* is paler and greyer above than nominate; *eximius* is more richly coloured than last; *itombwensis* is very dark above, with heavy blackish streaking on crown and mantle, buff below, heavy streaks extending to mid-breast and flanks; *winterbottomi* has throat and belly white, rest of underparts vinous buff, whiter tips of outer tail feathers; *lacuum* is duller, more olive-brown, than nominate, also paler below, with shorter, more sparse streaks on breast; *spurium* is colder and greyer than previous, with blacker breast streaking; *stabilis* is more buffish, with more pronounced streaking on crown and mantle, heavier blacker streaks below extending to lower breast; *lichenya* is warm dark brown above, heavily streaked, rich buff with sharper, more extensive streaking below, has little or no white on T5; *bocagei* is paler and more sandy above, rather pale with few streaks below; *grotei* is paler and greyer than previous; *rufuloides* is buffish-brown and less strongly streaked above, less buff below, with browner, more obvious breast streaking than nominate. Voice. Song, from perch or in flight, brief, of simple repeated notes, "tree-tree-tree" or "sreet-sreet-sreet-sreet". Calls include single "tweep" or disyllabic "tsseep tseep", also sharp "chip" or "trip" when flushed, and loud, sharp "psiu" in flight.
Habitat. Grassland, including fallow fields and other agricultural land, edges of pans, also recently burnt areas; also open areas in towns and villages. Breeds from sea-level to over 3400 m.
Food and Feeding. Small invertebrates, also seeds and other vegetable matter. In one study, grasshoppers (Acrididae) and beetles (Coleoptera) found in 69% of 51 stomachs, with moths and butterflies (Lepidoptera), ants (Hymenoptera), bugs (Hemiptera) and termites (Isoptera) also important prey. Stomach analyses in South Africa showed beetles, especially weevils (Curculionidae), and insect larvae, mainly of coleopterans and lepidopterans, to be main prey. Flies and their larvae (Diptera), dragonflies (Odonata), larval dung beetles (Scarabaeidae), mantids, cockroaches (Blattodea), spiders (Araneae), millipedes (Diplopoda) and other small invertebrates, such as earthworms (Oligochaeta), are also eaten, as well as weed seeds and other vegetable matter. Feathers and grit also ingested. Forages mainly on the ground or from low perches; walks or runs to pick prey, sometimes jumps or flies up to catch winged insect. Gregarious, often in groups, and in flocks of up to 100 in non-breeding season.
Breeding. Mainly before or during rains: breeds in Feb-Apr in Cameroon Highlands, Apr in Ethiopia, May-Jun in Uganda, Mar-Jul and Nov-Dec in Kenya, Mar-May, Sept and Oct in S Tanzania,

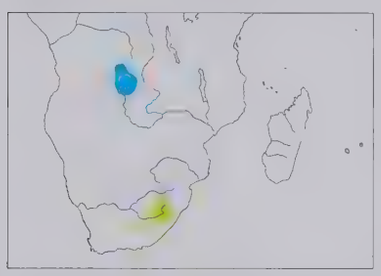
Aug-Oct in Zambia, Sept-Nov in Zimbabwe, Aug-Mar elsewhere in S Africa. Monogamous; territorial. Display has short song flight ending in steep dive. Nest a shallow cup of coarse dry grass, lined with rootlets, fibre and hair, built in depression in ground, usually concealed at base of a grass tussock, rock or shrub. Clutch 2-4 eggs, usually 3; incubation by both sexes, mainly by female, period 12-13 days; chicks fed by both parents, nestling period 12-17 days.
Movements. S populations mostly migratory, move N & E to as far as Zimbabwe, Zambia, Mozambique and possibly Malawi in non-breeding season. Other populations largely sedentary, although some local movements probable; those breeding at higher elevations, e.g. *winterbottomi*, make altitudinal movements. Apparently resident in W Africa; recorded in non-breeding season in S Mauritania and from Liberia and C Mali E to Chad, but race or races involved uncertain.
Status and Conservation. Not globally threatened. Common and widespread throughout most of range; rare in Arabia. Pipits occurring commonly around L Chad and in Mali in non-breeding season of uncertain identity, thought to be either of this species or, possibly, migrants of *A. richardi*; further study required. Benefits from clearance of savanna and woodland for agriculture, with fallow fields and arable land providing suitable wintering/feeding areas. Intensive agriculture, involving use of pesticides, may be a local threat.
Bibliography. Archer & Godman (1937-1961), Bannerman (1953), Benson (1946a), Benson & Benson (1977), Borrett (1969a), Borrett & Wilson (1971a), Campbell (1989), Chapin (1953), Clancey (1954, 1964b, 1968b, 1977b, 1984a, 1986a, 1986e, 1990a), Dean (1987, 2000), Dowsett & Dowsett-Lemaire (1997), Dowsett-Lemaire (1989), Edwards (1999), Gibbon (1989a), Ginn *et al.* (1989), Hall (1961), Hall & Moreau (1970), Harris *et al.* (1992), Keith *et al.* (1992), Kopij *et al.* (2002), Lewis & Pomeroy (1989), Louette (1981), Mackworth-Praed & Grant (1960, 1963), Maclean (1993a), McDonald (1974), Mendelsohn (1984a, 1984b), Pakenham (1979), Parker (1990, 1999), Paterson (1959), Pedersen (2000), Penry (1994), Prigogine (1982), Rossouw (1987), Saunders (1989), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Skead (1975), Stevenson & Fanshawe (2002), Steyn (1970, 1996), Tait (1991), Tarboton (2001), Tree (1963a, 1965), Voelker (1999a, 1999b, 1999c), Voelker & Edwards (1998), Wilson (1988), Winterbottom (1960), Woodall (1975), Zimmerman *et al.* (1996).

5. Mountain Pipit

Anthus hoeschi

French: Pipit alticole **German**: Hoeschspornpieper **Spanish**: Bisbita Montano

Taxonomy. *Anthus hoeschi* Stresemann, 1938, Erongo Mountains, Damaraland, Namibia.
Recent studies suggest that it is most closely linked phylogenetically to *A. latistriatus*. Formerly treated as part of expanded "*A. novaeseelandiae* complex", and synonymized with race *bocagei* of *A. cinnamomeus* by some authors. Described races *editus* (from Lesotho) and *lwenarum* (from NW Zambia) considered indistinguishable from other populations. Monotypic.
Distribution. Breeds in the Drakensberg of South Africa (KwaZulu-Natal, N Eastern Cape) and Lesotho; migrates to E Angola, S DRCongo and NW Zambia.



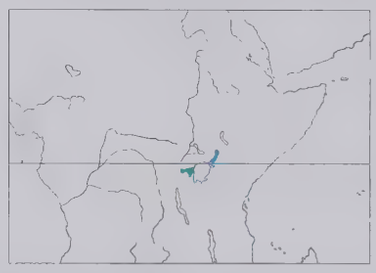
Descriptive notes. 18·5 cm; 23·5-31 g. Has broad buffy supercilium, dark brown eyestripe and moustachial stripe, narrow blackish malar streak; above, brown with heavy black streaking, rump less streaked; wing feathers blackish-brown, edged and tipped buff, lesser coverts buff; tail blackish-brown, T5 tipped buffish-white, T6 mostly buffish-white; pale buff below, whiter on throat, prominent short blackish-brown streaks on upper breast; axillaries and underwing-coverts buff; iris dark brown; bill dark brown, base of lower mandible pinkish or flesh-coloured; legs orange-brown. Distinguished from *A. similis* and *A. cinnamomeus* by darker coloration, heavier blackish-brown streaks on crown and mantle, more heavily dark-spotted upper breast, longer wing and tail, buffy white (not white) on two outer tail feathers, pinkish or flesh-coloured (rather than yellow) base of bill. Sexes alike. Juvenile not described. Voice. Song, given in flight or from perch, rendered as "tchrit-chritchritchri", "tsi-plu-tsi-plu-tsi-plu" or lower-pitched "chiri-chiri-chiri-chiri", deeper and more varied than that of *A. cinnamomeus*. Call a disyllabic "tuchit tuchit", flight call "psiu" or "chiri"; alarm call near nest a slowly repeated "twit".
Habitat. Short montane grassland at 2000-2700 m during breeding season; largely segregated from *A. cinnamomeus* by altitude, although the two apparently co-exist on the high plateau of Naudesk in the Drakensberg. On migration occurs on any grassland, but thought to winter on damp grassland in the Zambezi-Congo watershed.
Food and Feeding. Little known. Appears to forage mainly on the ground, picking at small invertebrates, as other members of genus.
Breeding. Laying recorded from late Nov to early Jan. Monogamous; territorial. Cruising display-flight. Nest a grass cup, placed on ground under a clump of grass. Clutch 3-4 eggs; incubation and fledging periods unknown.
Movements. Migratory. After breeding, moves N to E Angola, S DRCongo and NW Zambia; possibly also to N Angola. Details poorly known; dates of museum specimens indicate that it probably moves N through Northern Cape, where observed in Kimberley area Feb-Apr, and through Botswana and Namibia; may return S via E Botswana, where four specimens in Sept/Oct; present on breeding grounds from late Oct or Nov. Status in Zimbabwe uncertain, with only three specimens of doubtful status.
Status and Conservation. Not globally threatened. Restricted-range species: present in Lesotho Highlands EBA. No population estimates available; apparently rare. No evidence for any decrease in numbers. Nevertheless, small population within small range, and requirement for short montane grassland, could render it potentially vulnerable. Little known outside breeding range.
Bibliography. Bonde (1983), Borello (1992), Brooke (1984b, 1985), Clancey (1978c, 1980, 1984a, 1984b, 1985a, 1985b, 1986a, 1989b, 1990a), Clancey & Holliday (1952), Clancey *et al.* (1987), Collar *et al.* (1994), Dean (2000), Dowsett-Lemaire (1989), Fishpool & Evans (2001), Gibbon (1989a), Ginn *et al.* (1989), Hall (1961), Harrison *et al.* (1997), Hustler (1993), Keith *et al.* (1992), Liversidge *et al.* (1998), Mendelsohn (1984a), Newman (1996), Quickelberge (1972a), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Skinner (1986), Stresemann (1938), Sydow (1979), Tarboton (2001), Vincent (1951), Voelker (1999a, 1999b, 1999c), Voelker & Edwards (1998), White (1946, 1957a).

6. Jackson's Pipit

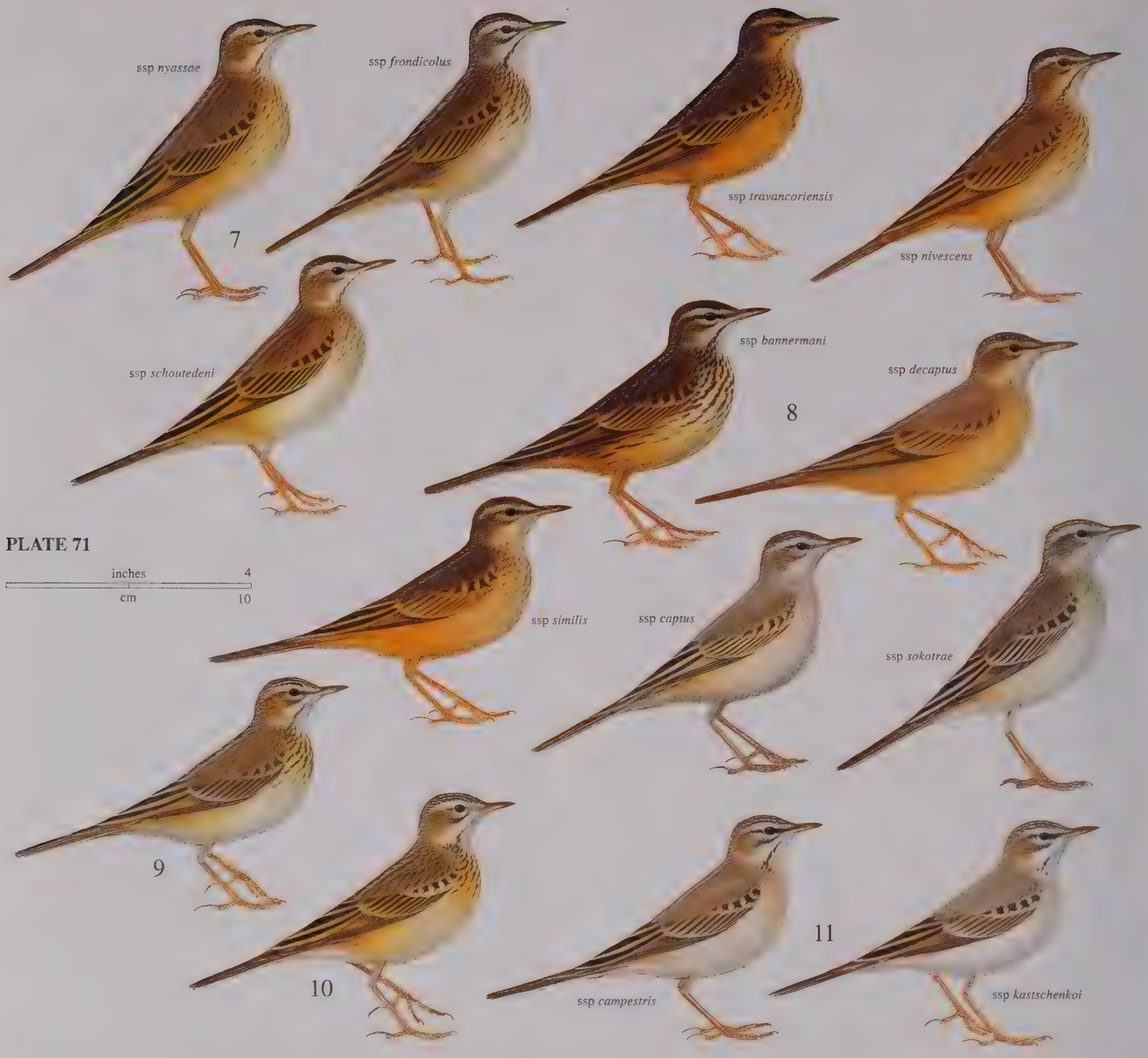
Anthus latistriatus

French: Pipit à raies larges **German**: Jacksonpieper **Spanish**: Bisbita de Jackson

Taxonomy. *Anthus latistriatus* Jackson, 1899, Kavirondo, south-western Kenya.
Formerly considered conspecific with *A. similis*, but has different wing formula. Alternatively, often regarded as a melanistic form of *A. cinnamomeus*, and race *winterbottomi* of latter placed with present species by some authors; differs, however, vocally and in hind-claw morphology. Sometimes treated as a race of expanded *A. novaeseelandiae*. Monotypic.
Distribution. Breeding range uncertain, believed to be Itombwe Highlands, in E DRCongo. SW Uganda, NW Tanzania and W Kenya in non-breeding season.



Descriptive notes. 18·5 cm. Has pale creamy supercilium, thin dark eyestripe and moustachial stripe, pale submoustachial stripe, narrow blackish malar stripe; blackish-brown upperparts with paler brown feather edgings, giving heavily streaked appearance; upperwing-coverts and tertials edged rich buff; tail blackish-brown, T5 pale brown with greyish-buff spot on tip, T6 greyish-buff or pale brown; throat and centre of upper breast pale buffy white, rest of underparts buffish-brown or rich cinnamon-buff, breast with heavy black streaks, sparse streaks on upper belly, blackish-brown streaks on flanks and thighs; iris brown; bill darkish brown, base of lower mandible pinkish-grey; legs pale brown, hind claw relatively short (8 mm). Distinguished from all races of *A. cinnamomeus* by darker plumage above and below, pinkish (not yellow) base of lower mandible, shorter and straighter hind claw. Sexes alike. Juvenile is more strongly mottled above and on breast. Voice. Song described as rapid "tit-it-it-it-it-it-it" followed by less harsh "trit-rit-rit-rit-rit". Call "chrit".
Habitat. Thought to breed on alpine grassland plateaux, at up to 2400 m; at lower altitudes at other times.
Food and Feeding. No information.
Breeding. Not known.
Movements. Believed to descend to lower altitudes after breeding.
Status and Conservation. Not globally threatened. Very poorly known species. No information on numbers, and knowledge of distribution incomplete; very rare in W Kenya. Ecology and breeding biology not recorded.
Bibliography. Chapin (1953), Clancey (1984a, 1985a, 1985b, 1986c, 1989b, 1990a), Dowsett & Dowsett-Lemaire (1987), Mackworth-Praed & Grant (1960, 1963), Newman *et al.* (1992), Prigogine (1982), Sinclair & Ryan (2003).

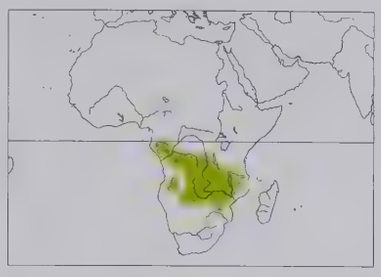


7. Woodland Pipit

Anthus nyassae

French: Pipit forestier **German**: Waldlandpieper **Spanish**: Bisbita del Nyasa
Other common names: Brachystegia/Wood Pipit; Chapin's Pipit (*schoutedeni*)

Taxonomy. *Anthus nicholsoni nyassae* Neumann, 1906, between Sangesi and Songea, south Tanzania.
Previously regarded as conspecific with *A. similis*. Race *winterbottomi* of *A. cinnamomeus* has been treated by some authors as a synonym of nominate race of present species. Race *chersophilus* possibly inseparable from *schoutedeni*, and both possibly better merged with nominate. Four subspecies recognized.
Subspecies and Distribution.
A. n. schoutedeni Chapin, 1937 - SE Gabon and S PRCongo E to S DRCongo, S to SC & SE Angola.
A. n. nyassae Neumann, 1906 - Zambia, SW & SE Tanzania, Malawi and NW Mozambique.
A. n. chersophilus Clancey, 1989 - NE Namibia and N Botswana.
A. n. frondicolus Clancey, 1964 - Zimbabwe and adjacent S Mozambique.
Descriptive notes. 18 cm; 23·8-25·9 g. Fairly large pipit with rather upright posture. Nominate race has prominent whitish supercilium and submoustachial stripe, thin dark malar stripe; above, rich warm brown with blackish streaks; wing feathers blackish-brown, edged light rufous-buff; tail dark brown, T5 with wedge of variable size on inner web white or buff-white, T6 with outer web and large distal wedge on inner web white; throat whitish, underparts vinous buff, streaked blackish on breast; iris dark brown; bill dark horn, pale pinkish base of lower mandible; legs flesh-brown. Differs from closely similar *A. similis* in whiter supercilium, more distinct streaking above. Sexes alike. Juvenile is darker above, with scalloped appearance, has well-defined dark spots, rather than streaks, on breast. Race *frondicolus* is rather cold above, with more prominent streaking than nominate; *chersophilus* is less saturated dorsally than previous, with whiter supercilium, paler wings, pale areas of outer rectrix whiter, breast light vinaceous, not buff, with more diffuse streaking, rest of underside white; *schoutedeni* is also prominently streaked above, throat and belly white, breast streaking sharp. Voice. Song, often from treetop, consists of short phrases, repeated, with modulations, at one-second intervals, "tssirit, tseu, sreep, tyoop" etc. Diagnostic high tremolo call usually given as it flies off.



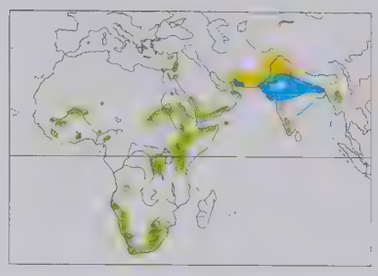
Habitat. Broadleaf woodland savanna with lightly grassed understorey; especially miombo (*Brachystegia- Julbernardia*) woodland in Zimbabwe, and *Burkea-Baikiaea* and *Pterocarpus* woodland in Namibia and Botswana. Lowlands to above 1800 m.
Food and Feeding. Small invertebrates, also some seeds. Stomach contents have included grasshoppers and crickets (Orthoptera), mantids, cockroaches (of genus *Blattaria*), bugs (Hemiptera), beetles (including scarabaeids and *Cicindela* tiger beetles), both worker and soldier termites (including *Hodotermes* harvester termites and *Macroterma* species), noctuid moths, ants (Hymenoptera) and braconid and sphecoid wasps, and spiders (Araneae). Forages on ground under trees and in open clearings; also gleans insects from leaves in trees.
Breeding. Little known. Lays before and during rains, but in dry season in miombo: Jan, Feb and Jul-Nov (mostly Sept-Nov) in Zimbabwe, and Sept-Nov in Malawi and Zambia. Nest a grass cup, lined with fine split grass and wood fibre. Clutch 2-3 eggs; incubation and fledging periods unknown.
Movements. Believed to be sedentary.
Status and Conservation. Not globally threatened. Current status uncertain. Has been suggested that further destruction of miombo and other broadleaf woodlands could place this species at risk.
Bibliography. Benson & Benson (1977), Benson *et al.* (1971), Brewster & Major (2000), Borrow & Demey (2001), Brown (1990, 1993), Chapin (1953), Clancey (1985a, 1987b, 1988, 1989b, 1990a, 1993b, 1996), Finch (2002), Harrison *et al.* (1997), Harwin *et al.* (1994), Hustler (1993), Irwin (1981), Keith *et al.* (1992), Lynes (1934), Mackworth-Praed & Grant (1960, 1963, 1973), Newman *et al.* (1992), Pedersen (2000), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Stjernstedt (2003, 2004), Tarboton (2001).

8. Long-billed Pipit

Anthus similis

French: Pipit à long bec **German**: Langschnabelpieper **Spanish**: Bisbita Piquilargo
Other common names: Brown Rock Pipit; Bannerman's Pipit (*bannermani*); Indian Rock Pipit (*jerdoni*); Indian Long-billed Pipit, Rufous Rock Pipit (*similis*); Kerala Rock Pipit (*travancoriensis*); Moco Pipit ("*moco*"); Persian Rock Pipit (*decaptus*)

Taxonomy. *Anthus similis* Jerdon, 1840, Jalna, Nilgiri Hills, southern India.
Has been thought to form a superspecies with *A. campestris*. Previously regarded as conspecific with *A. nyassae*. Race *winterbottomi* of *A. cinnamomeus* has sometimes been treated as a race of present species. Race *bannermani* considered a separate species, possibly closer to *A. latistriatus*, by some authors. Taxonomy complex, and listed ranges somewhat tentative; revision required. Race *nivescens* is possibly inseparable from *arabicus*, and *primarius* is sometimes merged with *nicholsoni*. Other described races are *josensis* (from C Nigeria) and *chapini* (Cameroon), both included within *bannermani*; *neumannianus* (Ethiopia) and *chyuluensis* (Chyulu Hills, in Kenya), included in *hararensis*; *moco* (WC Angola) and *hallae* (Uganda), inseparable from *dewittei*; and *cockburniae* (Nilgiris), synonymous with nominate. Nineteen subspecies recognized.
Subspecies and Distribution.
A. s. asbenaicus Rothschild, 1920 - S Sahara in C & E Mali and C Niger.
A. s. bannermani Bates, 1930 - mountains of SW Mali, Guinea, Sierra Leone and N Liberia E to C & SE Nigeria and W Cameroon.
A. s. captus Hartert, 1905 - Lebanon, Syria, Israel, Palestine and W Jordan.
A. s. jebelmarrae Lynes, 1920 - mountains of W & C Sudan.
A. s. nivescens Reichenow, 1905 - mountains of SE Egypt (Gebel Elba), and from hills of Red Sea coast in NE Sudan and Eritrea S to mountains in NW Somalia and N Kenya.
A. s. hararensis Neumann, 1906 - highlands of Eritrea, Ethiopia, Kenya and Tanzania.
A. s. dewittei Chapin, 1937 - highlands of E & SE DRCongo, SW Uganda, Rwanda, Burundi and C Angola (Mt Moco, in Huambo).
A. s. palliditinctus Clancey, 1956 - extreme SW Angola and NW Namibia.
A. s. leucocraspedon Reichenow, 1915 - W & S Namibia and SW South Africa (W Northern Cape, NW Western Cape).
A. s. nicholsoni Sharpe, 1884 - SE Botswana and NE South Africa (Northern Province S to Free State).
A. s. petricolus Clancey, 1956 - Lesotho and E South Africa.
A. s. primarius Clancey, 1990 - S South Africa (S Western Cape E to N Eastern Cape).
A. s. arabicus Hartert, 1917 - SW, S & SE Arabian Peninsula.
A. s. sokotrae Hartert, 1917 - Socotra I.
A. s. decaptus Meinertzhagen, 1920 - S Iran (Zagros Mts) E to W Pakistan (Baluchistan); winters S to NW India.
A. s. jerdoni Finsch, 1870 - breeds E Afghanistan E in Himalayas to W Nepal; winters S to NC India and Bangladesh.
A. s. similis Jerdon, 1840 - peninsular India from Bombay S to Karnataka and W Tamil Nadu (Nilgiri and Palni Hills).
A. s. travancoriensis Ripley, 1953 - SW India (Kerala-W Tamil Nadu border, from Palni Hills S to Ashambu Hills).
A. s. yamethini B. P. Hall, 1957 - C Myanmar.
Descriptive notes. 17-20 cm; male 30-35 g, female 28-31 g, unsexed (*hararensis*) 21·5-29 g, unsexed (*nicholsoni*) 22-25 g. Large, stout pipit with variably streaked upperparts and breast, unstreaked flanks. Nominate race has prominent buff supercilium, buff-streaked brown lores and ear-coverts, indistinct narrow dark brown malar stripe; crown and upperparts dark grey-brown, distinctly streaked blackish-brown; wing feathers dark brown, tipped and edged buff, lesser wing-coverts buffish-brown; tail dark brown, T5 with buffish-white outer edges and tip of inner web, T6 with buffy outer web and large dusky rufous distal wedge on inner web; throat greyish-white, underparts dark pinkish-rufous, breast clearly streaked grey-brown, longest undertail-coverts with dark centres; underwing-coverts and axillaries warm buff; iris dark brown; bill dark horn, pale pinkish base of lower mandible; legs flesh-brown, hind claw shorter than hind toe. Differs from e.g. "*A. novaeseelandiae* complex" in slightly larger size, proportionately larger bill, darker upperparts, buff (not white) outer tail feathers. Sexes alike. Juvenile is darker than adult, with more obvious streaking above, giving scalloped appearance, pale wingbars more obvious, paler below, breast with well-defined spots, rather than streaks. Races vary in size, leg length, plumage coloration and pattern, more streaked above in Afrotropics and Arabia, generally unstreaked in N & NE of range: *bannermani* is very dark earth-brown with sandy-buff fringes above, sandy-buff with heavy streaks below, distinct malar stripe; *asbenaicus* is like previous but less dark, also less streaked below; *jebelmarrae* has paler and warmer upperparts, greyish tinge on hindneck, buff with cinnamon wash below, poorly defined chest streaks; *hararensis* is darker, greyer and colder above, with more distinct streaking, feather edges narrow and lighter, cinnamon-buff below with dusky streaks; *dewittei* is smaller and darker than previous; *nivescens* is relatively pale above, rather pale cinnamon-buff below, malar stripe well marked; *sokotrae* resembles last but is greyer and more distinctly marked, with well-defined dark centres and light edges of feathers on upperparts (looking more clearly streaked); *nicholsoni* is brown above with indistinct streaks, most prominent on head, has warm buff underparts; *petricolus* is darker and colder than last, also less buffy; *primarius* is similar to previous, but with breast streaking more extensive, and blacker malar streak, crown feathers and breast streaking; *leucocraspedon* is paler, more sandy, with pale buff underparts, short fine breast streaks; *palliditinctus* is greyer above and paler below than previous; *captus* is small, relatively short-legged, greyish and indistinctly streaked above, more pale pinkish-buff below, darker on flanks and undertail-coverts, brown-grey streaks form diffuse breastband, central pair of tail feathers with pale edges, outer two pairs with pale buffish or greyish wedges; *arabicus* is slightly larger and darker than last, browner and with broader and darker streaks above, more dusky rufous and with more numerous and darker streaks below; *decaptus* is larger than previous, has proportionately longer tail, shorter heavier bill, mantle and scapulars almost plain, rufous underparts paler and less streaked; *jerdoni* is smaller and darker than last, more brownish with very little streaking above, more rufous below with more breast streaking, supercilium and ear-coverts more rufous, also pale wedges on outer tail more buffy; *travancoriensis* is more uniformly dark above and below than nominate, has cinnamon (not buff) underparts, also edges of outer rectrix darker tawny-olive, inner web of T5 with much larger area of dark brown; *yamethini* is small, with proportionately short tail, breast streaks rather indistinct. VOICE. Song, from ground or in flight, a simple unmusical series of high, monotonous and well-spaced, often disjointed notes and phrases, e.g. "tjup threee tjup tjup threee" or "chreep shreep chew-ee", more varied than that of *A. vaalensis* or *A. leucophrys*. Call sharp "wheet" or loud, ringing "che-vlee".



Habitat. Stony or rocky hillsides with sparse ground cover, often with scrub or open woodland. In Africa, often slopes in rather arid and eroded broken veld, often steppe-like, with erosion scars, stones and rocks interspersed with grass clumps and low scrub, trees and light woodland. Visits nearby well-grazed or burnt ground; often one of the first pipits in S Africa to visit an area after fire. Lowlands to 2600 m; 1300-1800 m in NE Africa.
Food and Feeding. Insects and other small invertebrates, also seeds; grit also ingested. Diet includes grasshoppers and crickets (Orthoptera), beetles (Coleoptera), bugs (Hemiptera), mantids (Mantidae), cockroaches (Blattodea), termites (Isoptera), ants and wasps (Hymenoptera), larval and adult moths (Lepidoptera) and spiders (Araneae). Stomach analyses in South Africa revealed mostly beetles, notably weevils (Curculionidae), and insect larvae (mainly coleopterans and lepidopterans), similar to prey taken by *A. cinnamomeus* and *A. leucophrys*. Forages mainly on the ground; also picks prey items from vegetation and branches. Often feeds on recently burnt ground.
Breeding. Breeds in Mar-Apr in Sierra Leone and Cameroon, Jun-Jul in Niger, May-Oct in Sudan, Apr-May in Kenya, Oct-Apr in N Tanzania, Sept-Nov in Malawi and Zambia, Jan, Feb and Jul-Nov (mostly Sept-Nov) in Zimbabwe, and Oct-Dec in South Africa; in Mar-Jul in Israel; in Apr-Aug in Indian Subcontinent. Monogamous; territorial. Fluttering display-flight. Nest a deep cup of dry grass, lined with finer grasses and rootlets, built on ground, often on a slope, in shelter of rock or grass tussock. Clutch 2-3 eggs, sometimes 4 or 5; incubation by female, period 13-14 days; fledging period c. 13-14 days. Nests often parasitized by Common Cuckoo (*Cuculus canorus*) in Israel.
Movements. Generally resident; some local or elevational movements. In Africa, more sedentary than other pipits, with only local movement, often involving changes in altitude. Elsewhere, most upland or montane populations are resident or make altitudinal movements; total or partial short-distance migrant in Himalayas, where race *decaptus* winters in lower valleys and foothills and *jerdoni* descends to below 900 m in the foothills and into NC & NE India and NW Bangladesh. Resident in C & S India and in Myanmar.
Status and Conservation. Not globally threatened. Widespread and locally frequent over its large range. Estimated 1500-2000 pairs in Israel in 1980s. Apparent range expansion in NE Africa; nine individuals recorded in SE Egypt (Wadi Aideib, in Gebel Elba) in Apr 1997 presumed to be a sign of N extension of breeding range of race *nivescens*. As the species inhabits terrain largely unsuitable for agriculture, such as dry rocky hillsides and semi-desert country, it is unlikely to have suffered much from habitat destruction.
Bibliography. Ali (1969, 1996), Ali & Ripley (1998), Alström & Mild (2003), Archer & Godman (1937-1961), Ash & Miskell (1998), Aspinall (1996), Bannerman (1953), Benson (1946a), Borrett (1973), Borrow & Demey (2001), Clancey (1956b, 1964a, 1964b, 1984c, 1985a, 1986d, 1987b, 1990a), Cramp (1988), Dean (2000), Dodsworth (1914), Dowsett & Dowsett-Lemaire (1986, 1987, 1993, 1997), Dowsett & Forbes-Watson (1993), Gancz (1996), Gatter (1997), Ginn *et al.* (1989), Grieve *et al.* (2001), Hall & Moreau (1970), Harrison *et al.* (1997), Hüe & Étchécopar (1970), Jennings (1995), Keith *et al.* (1992), Kirwan (1997), Kopij *et al.* (2002), Laird & Gencz (1993), Lewis & Pomeroy (1989), MacDonald & Cave (1948), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Martin (1992), Mukherjee (1995), Nikolaus (1987), Paz (1987), Penry (1994), Ripley (1982), Roberts, A. (1913), Roberts, T.J. (1992), Robson (2000), Sinclair & Hockey (1996), Smythies (1986), Snow & Perrins (1998), de Swardt (2001), Tarboton (2001), Taylor & Macdonald (1979), Voelker (1999a, 1999b, 1999c), Winterbottom (1959b), Yosef & Malka (1998).

9. Kimberley Pipit

Anthus pseudosimilis

French: Pipit de Kimberley **German**: Kimberleypieper **Spanish**: Bisbita del Kimberley

Taxonomy. *Anthus pseudosimilis* Liversidge and Voelker, 2002, Kimberley, South Africa.

On following pages: 10. Blyth's Pipit (*Anthus godlewskii*); 11. Tawny Pipit (*Anthus campestris*).

Sometimes referred to erroneously as *A. difficilis*. Recently discovered species, separated from *A. similis* by DNA evidence. Molecular-genetic analysis suggests closer relationship with *A. melindae*; possibly also close to *A. leucophrys* or *A. cinnamomeus*. Monotypic.
Distribution. Poorly known. Most records from Kimberley area of C South Africa (E Northern Cape-W Free State); also recorded in NW Northern Cape and E Northern Province, and in S Namibia and on Botswana-South Africa border (Kalagkadi Transfrontier Park).



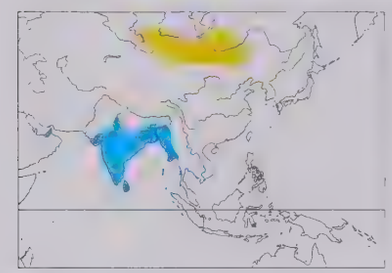
Descriptive notes. 18 cm; 28-35·2 g. Has pale creamy buff supercilium, rufous ear-coverts finely streaked buff, whitish moustachial stripe, blackish-brown malar stripe; crown and upperparts umber-brown with pale feather edgings, giving streaked effect, particularly on crown; wing feathers dark brown, edged buff, pale wing-covert tips forming two indistinct bars; tail dark brown, outer rectrix with outer web and distal half of inner web white, sometimes tinged buffy; pale buff below, slightly darker on breast, which is broadly streaked dark brown; underwing-coverts buff; iris dark brown; bill dark horn, pale yellowish base of lower mandible; legs pale horn. Distinguished from very similar *A. similis* by shorter bill, longer hind claw, and more distinct cream supercilium, rufous ear-coverts and black malar stripe, in the hand also by different wing formula (5th primary shorter than, rather than equal to, 6th) and primary emargination; from similar *A. cinnamomeus* by darker brown streaks on back, more extensive breastband with heavier streaking. Sexes alike. Juvenile undescribed. VOICE. Song, in flight, consists of 3 rather deep notes, "chreep-choop-chreep", in descending series, repeated often; similar to song of *A. similis*, but descending in pitch.
Habitat. Grassland with short vegetation (less than 15 cm tall) and bare ground in open grassveld, open Kalahari sandveld, karroid vegetation, panveld and open pan surroundings, dry riverbeds and limestone areas.
Food and Feeding. Invertebrates; no details. Picks food items from ground and grass while walking in crouched posture. Differs from *A. similis* in frequent tail-flicking and crouching while pecking; unlike that species, does not perch in trees or bushes.
Breeding. Laying Oct-Nov. In display-flight rises to 20-30 m, then calls as it descends in loops. Two nests found: well concealed in grass tufts and roots, one with a tunnel 15 cm long leading to nest cup; one with clutch of 2 eggs, other with brood of 3 chicks.
Movements. Apparently largely sedentary, but variations in numbers at some sites suggest some movements in May-Aug.
Status and Conservation. Not globally threatened. Fairly common within small range. Poorly known species, requires further investigation; records away from Kimberley area suggest that breeding distribution possibly wider than is currently known.
Bibliography. Anon. (2002d), Etherington (2002), Liversidge & Voelker (2002), Sangster (2002), Sinclair & Ryan (2003), Voelker (1999a, 1999b), Voelker & Edwards (1998).

10. Blyth's Pipit

Anthus godlewskii

French: Pipit de Godlewski **German**: Steppenpieper **Spanish**: Bisbita Estepario
Other common names: Godlewski's Pipit

Taxonomy. *Agrodoma godlewskii* Taczanowski, 1876, Argun River valley, Transbaikalia, on Russia-China border.
In the past was sometimes treated as conspecific with *A. campestris*. Monotypic.
Distribution. Breeds from S Russia (E Altai Mts) E to Transbaikalia and NE China (W Heilongjiang), S to S Mongolia and EC Nei Mongol; winters mainly in Indian Subcontinent.



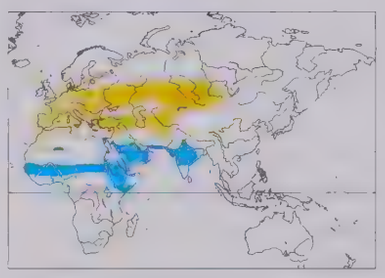
Descriptive notes. 15-17 cm; 17-30·5 g. Has unmarked pale lores, creamy supercilium extending well behind eye, thin blackish moustachial stripe, broad buffy submoustachial stripe, narrow blackish malar stripe and malar patch; above, grey-brown, streaked blackish-brown, wing feathers edged and tipped buffish (two indistinct pale wingbars); tail blackish-brown, edges of central feather pair tinged rufous, outer two pairs edged and tipped buffy and with outer web and much of distal inner web white; buffish below, more orange-buff on flanks, vent and undertail-coverts, pronounced dark streaking on upper breast; axillaries and underwing-coverts orange-buff; iris dark brown; upper mandible darkish grey, lower mandible pale pink with darkish grey tip; legs pale pink or yellowish-pink, hind claw medium length (13 mm) and comparatively weak. Distinguished from *A. richardi* by shorter, more pointed bill, shorter hind claw, more strongly streaked crown and nape, less distinct supercilium, paler underparts, paler tips and more square-shaped dark centres of median wing-coverts; from *A. campestris* by streaked breast. Sexes alike. Juvenile is less extensively dark-streaked, has white feather tips giving scalloped appearance, wingbars whiter and more prominent. VOICE. Song, usually in flight, a series of rasping "zret" notes interspersed with higher "zrit" notes, occasionally brief interjections of more complex rapid phrases, ends with fast repetition of harsh notes, lasts up to 1 minute or more; very different from songs of *A. richardi*, *A. rufulus* and *A. campestris*. Calls include loud, discordant and clipped "chup", "chep" or "choop", usually in flight, and longer "psheeu", usually when flushed; often combined, e.g. "pshee chep-chep".
Habitat. Breeds on dry rocky mountain slopes, usually with little vegetation, and stony or gravelly steppes; in *Caragana* thickets on stony steppe in Transbaikalia; generally in gravel or stony steppe, in meadow steppe and on dry slopes in Mongolia. In non-breeding season found in open country, from dry paddyfields, grassland and fallow fields to edges of cultivations; often in swampy areas on migration. To 3000 m in winter quarters; recorded to 6000 m on Mt Everest on migration.
Food and Feeding. Small insects and other invertebrates; also seeds. Forages on the ground, picking small items from surface; behaviour much as that of other grassland pipits.
Breeding. Laying in May. In display-flight, rises to 10-20 m, hovers while singing, then descends steeply to ground. Nest a well-camouflaged grass cup, on ground. Clutch 3-5 eggs; incubation by female, period 12-14 days; fledging period apparently not documented.
Movements. Long-distance migrant. Winters in Indian Subcontinent S to Sri Lanka, and also, uncommonly, in Myanmar; rare but regular in winter in SE Arabian Peninsula, where up to ten annually in United Arab Emirates. Recorded on passage through SE Tibet, Bhutan, Sikkim and Nepal during Aug to end Oct; arrival in winter quarters in early Sept, departure late Apr/May; arrives back on breeding grounds in Russia from early May. Vagrants recorded in many countries, e.g. in W to Israel and NW Europe (Norway, Sweden, Finland, Germany, Britain, France, Netherlands, Belgium), in E to Thailand and Japan; also Andaman Is, in NE Indian Ocean.
Status and Conservation. Not globally threatened. Widespread and common in breeding range; possibly extends farther S, into N China. Widespread and locally common winter visitor in India, although less common in S. Not considered to be at any risk.
Bibliography. Ali & Ripley (1998), Ali *et al.* (1996), Alström (1988, 1989), Alström & Mild (1988, 1997b, 2003), Barua & Sharma (1999), Berlijn *et al.* (1997), Bradshaw (1994), Brazil (1991), Copete & Armada (2001), Cramp (1988), Davidson & Kirwan (1997), Dementiev *et al.* (1970), Erterius (2002), Étchécopar & Hüe (1983b), Frémont (2004), Grimmett *et al.* (1998), Hall (1957), Henry (1998), Inskipp & Inskipp (1991), James (1994), King *et al.* (1975), Kratzer (1997), La Touche (1931-1934), Lekagul & Round (1991), Marsh & Odin (1994), Mauersberger *et al.* (1982), Mey (1988), Meyer de Schauensee (1984), Mills & Preston (1982), Perlman (2001), Rauste & Salonen (1978), Ripley (1982), Robson (2000), Sandhu & Saini (1990), Shirihai (1999), Skakuj & Stawarczyk (1997), Small (1997), Smythies (1986), Snow & Perrins (1998), Stepanyan (1990), Stephan (1988, 1994), Thompson *et al.* (1993), Van den Berg *et al.* (1983).

11. Tawny Pipit

Anthus campestris

French: Pipit rousseline **German**: Brachpieper **Spanish**: Bisbita Campestre

Taxonomy. *Alauda campestris* Linnaeus, 1758, Sweden.
Has sometimes been thought to form a superspecies with *A. similis*. In the past was sometimes treated as conspecific with *A. godlewskii*. Variation largely clinal, in N becoming smaller and paler from W to E, and in S becoming larger and greyer from NW Africa to Greece and then smaller and greyer E of there; naming of geographical races considered unwarranted by some taxonomists; alternatively, *kastschenkoi* included within nominate. Conversely, birds from N Iran and Turkey, intermediate in plumage between nominate and *griseus* but apparently larger than both, sometimes separated as race *boehmii*. Three subspecies recognized.
Subspecies and Distribution.
A. c. campestris (Linnaeus, 1758) - breeds from C & S Europe (Denmark and S Baltic S to Mediterranean countries) and NW Africa (Morocco E to Tunisia, possibly also SW Mauritania and NW Libya) E to SW Siberia and NW Kazakhstan and, in S, to N Iran and Turkmenistan; also locally in Middle East (Lebanon, S Syria, N Israel). Winters mainly in Africa and Arabia.
A. c. kastschenkoi H. C. Johansen, 1952 - S Siberia E to NW Mongolia; winters in S Asia.
A. c. griseus Nicoll, 1920 - SW Kazakhstan S to NE Iran and N Afghanistan, E to Dzhungarskiy Alatau Mts, extreme NW China (Tien Shan, in N Xinjiang) and SC Mongolia; winters in SW & S Asia.



Descriptive notes. 16·5-17 cm; 17-32 g, male average 29·5 g, female average 28 g. Fairly distictive pipit with rather uniform plumage, long tail and *Motacilla*-like stance. Nominate race has prominent creamy or buffish supercilium, blackish loral and moustachial stripes; lores and ear-coverts brown with creamy flecks; distinct, narrow dark brown malar streak; pale sandy brown above, sometimes with greyish tinge, indistinctly streaked blackish-brown, back and rump unmarked; flight-feathers and primary coverts dark brown with narrow white edges, tertials and greater wing-coverts paler with broad sandy-buff edges and tips, median coverts with blackish centres and broad buffish-white tips (indistinct wingbar), lesser coverts sandy brown; tail blackish-brown, central feather pair edged pale buff or buffy rufous, outer two pairs with pale buff wedges on inner web, white outer web and much of distal inner web; creamy white below, breast and flanks buff, breast with sparse short dark brown streaks; underwing-coverts and axillaries creamy buff; iris blackish-brown; bill dark brown, flesh-coloured base of lower mandible; legs bright yellowish flesh. Differs from *A. similis* in smaller size, more sandy and less grey plumage coloration. Sexes alike. Juvenile is scalloped or strongly streaked above, with tawny feather edges, median coverts edged and tipped whitish, forming more obvious wingbar, upper breast sharply streaked. Race *kastschenkoi* is smaller, paler and often more streaked than nominate; *griseus* is slightly larger than previous, also somewhat brighter grey (more brownish or sandy) above, with more contrasting ochre rump, more white below than previous, also on average smaller than nominate, with shorter wings and legs. VOICE. Song, in flight or from perch, a disyllabic or trisyllabic note, e.g. "tzirléé" or "tsirluéé or "tsirlííu", repeated at regular intervals of 1-3 seconds for up to a minute or more. Calls include explosive "chilp" or "chiip", a high-pitched sharp short "tschuwi" and, on take-off, a loud "tseep" or "tseuc", reminiscent of call of *Motacilla flava*; shrill "sree" and high-pitched "tji-tji-tji" near nest.
Habitat. Open dry habitats, from sand dunes, sandy heaths, dry grassland and clear-felled areas to artificial habitats such as gravel pits; steppe and semi-deserts in C & E parts of range. Favours areas with dwarf shrubs and low-growing trees for songposts. Lowlands to c. 450 m in Europe; to 2600 m in NW Africa and Caucasus; to 3600 m in E Kazakhstan.
Food and Feeding. Mainly insects, also other invertebreates, and seeds; rarely, small vertebrates (reptiles). Recorded prey include grasshoppers and locusts (Orthoptera), termites (Isoptera), dragonflies and damselflies (Odonata), mantids (Mantodea), adult and larval butterflies and moths (Lepidoptera), lacewings (Neuroptera), flies (Diptera), sawflies and ants (Hymenoptera), beetles (Coleoptera) and bugs (Hemiptera), as well as spiders (Araneae), harvestmen (Opiliones), slugs and snails (Mollusca). One record of sand lizard (*Lacerta agilis*) taken. In 41 items found in 12 stomachs from Moldova, 44% were beetles (mainly curculionids, carabids and chrysomelids), 19% orthopterans, 19% hymenopterans, 5% lepidopteran larvae, and seeds; in Crimea, 78·6% of items were curculionid and carabid beetles. Of 280 items fed to chicks in N Kazakhstan, 43% were orthopterans, c. 17·6% lepidopterans, c. 11% spiders, with dipterans, hemipterans and hymenopterans each forming 5-10%, and beetles, snails, lacewings and dragonflies each less than 5%. In African non-breeding quarters, locusts and grasshoppers, termites, assassin bugs (Reduviidae), caterpillars, hymenopterans, beetles and grass seed eaten. Forages mainly on the ground, by running and pecking. Occasionally jumps up to take flying insects, such as termites; only rarely flies after prey, or hovers to find it. Will stand on large items such as a grasshoppers, and dismember these by hammering with the bill.

Breeding. Season mid-Apr to mid-Aug, earlier in N Africa and later in N Europe (mid-Jun in Sweden); in W Europe two laying peaks (mid-May to early Jun, mid-Jun to early Jul) suggestive of double brooding. Monogamous; territorial. In display-flight, rises to c. 30 m, occasionally higher (to 150 m), sings while circling randomly on deeply undulating course; descent steep, or gliding and angled, sometimes with continued song. Nest built mainly by female, sometimes helped by male, a cup of grass stems, leaves and roots, lined with finer plant material and hair, built in scrape or hollow on ground or in tuft of grass. Clutch 3-6 eggs, mainly 4-5, mean 4·23 in S Sweden, 4·47 in Netherlands, 3·85 in E Germany; incubation by female, perhaps sometimes by both sexes, period 11·5-14 days, mostly 12 days; nestlings fed by both parents, for 13-14 days, post-fledging care also by both parents, for 4-5 weeks.

Movements. Almost wholly migratory. W populations winter predominantly in Sahel zone in sub-Saharan Africa, also in Nile Valley and region from S Sudan S to N Somalia and, more rarely, to Uganda and N Kenya; occasionally recorded farther S, e.g. Liberia E to Ghana; a few occasionally remain farther N, in E Mediterranean region, and small numbers spend non-breeding season in Sahara Desert (S Algeria). E populations migrate mainly to Arabian Peninsula and S Asia E to NW Indian Subcontinent, more rarely S to C peninsular India. Race *griseus* recorded on passage in Middle East and Egypt. Vagrants recorded N to Finland, Norway and British Is, also W to Madeira and Cape Verde Is.

Status and Conservation. Not globally threatened. Fairly common in much of range. Populations in W & C Europe have declined markedly following habitat loss from afforestation of open habitats, scrub encroachment and intensification of agriculture; climate change may also be implicated; in C Europe only isolated breeding sites remain, mainly at inland sand dunes, open-cast mines and forest clearings. Main European population lies in the maquis and garrigue of Mediterranean region and the steppe and semi-deserts of SE European Russia and Ukraine. In Africa, recently reported as breeding in Afrotropics, two nests being built in mid-May in N Somalia, and displaying individuals found on Ethiopian side of border in Apr-May 1995; further fieldwork required in order to ascertain whether breeding regular in this region; breeding also suspected in SW Mauritania and NW Libya, but no confirmation.

Bibliography. Adamian & Klem (1999), Alström & Mild (2003), d'Andurain *et al.* (1999), Archer & Godman (1937-1961), Ash & Miskell (1990, 1998), Averin & Ganya (1970), Bannerman (1953), Bijlsma (1978a, 1978b, 1990), Blondel *et al.* (1988), Borrow & Demey (2001), Britton (1980), Cramp (1988), Davidson (1996), Dementiev *et al.* (1970), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Étchécopar & Hüe (1964, 1983b), Fischer (1991), Glutz von Blotzheim (1981), Goodman *et al.* (1989), Grant (1972), Grimmett (1987), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Handrinos & Akriotis (1997), Heath & Evans (2000), Heath *et al.* (2000), Heinroth & Steinbacher (1952), Hirschfeld (1995), Högstedt (1978), Hüe & Étchécopar (1970), Keith *et al.* (1992), Kostin (1983), Krüger (1980, 1989), Lee (1962), Ma Ming *et al.* (2000), Mackworth-Praed & Grant (1960, 1973), Makatsch (1976), Martínez (2003), Mukherjee (1995), Müller (1983), Nikolaus (1987), Nörup (1963), Paz (1987), Pearson & Lack (1992), Riddiford (1977), Ripley (1982), Roberts, A. (1913), Roberts, T.J. (1992), Rogacheva (1992), Roos (1984), Roselaar (1995), Schmidt (1993), Simpson (1971), Smetana & Guserva (1981), Snow & Perrins (1998), Stepanyan (1990), Suárez (1994), Suárez *et al.* (1993), Summers (1974), Tellería *et al.* (1999), Thévenot *et al.* (2003), Winterbottom (1960), Yanes *et al.* (1996), Yosef & Malka (1998), Zimmerman *et al.* (1996).



PLATE 72

inches 3

cm 8

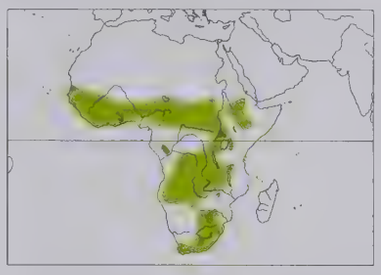
12. Plain-backed Pipit

Anthus leucophrys

French: Pipit à dos uni **German**: Braunrückenpieper **Spanish**: Bisbita Liso

Taxonomy. *Anthus leucophrys* Vieillot, 1818, Cape of Good Hope, South Africa.
Races *goodsoni* and *saphiroi* of *A. vaalensis* included in present species by some authors. Variation partly clinal, with races intergrading from W to E; *ansorgei* also intergrades with *zenkeri* in Guinea-Bissau. Other described races are *prunus* (Angola), merged with *bohndorffi*, *turneri* (NW Kenya), synonymized with *zenkeri*, and *enunciator* (Swaziland), merged with nominate. Seven subspecies recognized.

Subspecies and Distribution.
A. l. ansorgei C. M. N. White, 1948 - S Mauritania, Senegal, Gambia and Guinea-Bissau.
A. l. zenkeri Neumann, 1906 - Guinea and S Mali E to Ghana, thence E to S Chad, Central African Republic and S Sudan, and S to Cameroon, N & E DRCongo, Burundi, NW Tanzania and W Kenya.
A. l. gouldii Fraser, 1843 - Sierra Leone, Liberia and Ivory Coast.
A. l. omoensis Neumann, 1906 - SE Sudan and N, C & W Ethiopia.
A. l. bohndorffi Neumann, 1906 - SE Gabon, C PRCongo, and S DRCongo E to W Tanzania and S to C Angola, NW Zambia and N Malawi (R Songwe).
A. l. tephridorsus Clancey, 1967 - S Angola and S Zambia S to N Namibia, NW Botswana and NE Zimbabwe.
A. l. leucophrys Vieillot, 1818 - SE Botswana E to extreme S Mozambique, S to E & S South Africa.



Descriptive notes. 15-17 cm; 21-32 g. Nominate race has buffy supercilium, brown lores and ear-coverts, latter mottled buffish, dark eyestripe and moustachial stripe, faint dark malar stripe; upperparts olive-brown above, faintly streaked on head; remiges and larger wing-coverts blackish-brown, secondaries with broad sandy-brown edgings, tertials and greater and median wing-coverts with broad sandy-brown edges and tips, lesser coverts brown; tail blackish-brown, T5 with pale brown outer web and tip of inner web, T6 wholly pale brown; pale buff below, paler on chin and throat, browner on breast, upper breast with indistinct brown streaking; underwing-coverts and axillaries warm buff; iris dark brown; bill blackish-brown, base of lower mandible yellowish flesh; legs pale brown or flesh-brown to pinkish-buff, hind claw at least 12 mm. Distinguished with difficulty from very similar *A. vaalensis* by slightly darker coloration above and below, base of lower mandible usually yellowish (variable); in the hand, also has stouter, straighter, on average slightly longer hind claw. Sexes alike. Juvenile is browner, with upperparts, wing-coverts and tertials narrowly edged buffish, obvious short dark brown streaks on breast. Race *tephridorsus* is paler and more greyish above than nominate; *bohndorffi* is browner and less olive above, and paler below; *zenkeri* is browner above than previous, with more cinnamon edges of wing feathers, and deeper cinnamon-tinged buff below, rectrix T5 with only the tip pale, hind claw shorter; *omoensis* is larger and darker than last, supercilium extending well behind eye, richer cinnamon below, heavier breast streaking; *gouldii* is smaller, rather dark above, with less cinnamon on wings, paler and more creamy below, more distinctly streaked on breast; *ansorgei* is greyer and paler above, belly creamy, breast with distinct broad dark streaks. Voice. Song, from ground or perch, an unstructured monotonous series of well-spaced phrases, "chwee-chweep-chwee" or "tjeeh tjup three tweeh tjeeh", like those of a sparrow (*Passer*); sometimes includes a more distinctive short low-pitched trill. Alarm call a thin, soft "chissik"; sparrow-like "t-t-tit" when flushed.

Habitat. Savanna with scattered trees and bushes in better-wooded areas, open grassland with scattered bushes. Occurs in various open habitats, from short or burnt grassland to fallow land and arable fields. Where sympatric with *A. vaalensis*, as in Botswana and Zimbabwe, favours floodplains and other wet grasslands. Generally low to medium elevations, but to 2200 m in E Africa.

Food and Feeding. Insects and their larvae, especially caterpillars (Lepidoptera) and grasshoppers (Orthoptera); also seeds. In stomach contents from S Africa, beetles (Coleoptera), particularly weevils (Curculionidae), and mantids (Mantodea) and insect larvae (mainly of coleopterans and lepidopterans) the main components of diet; soldier termites (Isoptera), grasshoppers and ants (Hymenoptera), and some seeds, were also found in stomachs. Forages on the ground; probably takes more food from vegetation than from ground surface.

Breeding. Breeds mainly during rains: Apr-Jun in Senegambia, Jan-May in Sierra Leone, Feb-Jun in Ghana, juvenile in Jul in Burkina Faso; in all months in S Nigeria but mainly Mar-May in N; Mar-Jun and Aug in Kenya, Aug in SW Tanzania, Sept-Nov in Zambia; in South Africa Sept-Dec in N, Oct-Dec in E & S. Monogamous; territorial, but sometimes several pairs nest close together. Nest a deep grassy cup, lined with finer rootlets, hair or even feathers and fur, built on ground close to a grass tussock. Clutch 2-3 eggs, occasionally 4; incubation and fledging periods not documented; young fed by both parents.

Movements. Little known; some populations believed to be sedentary, with others making altitudinal or nomadic movements.

Status and Conservation. Not globally threatened. Uncommon to locally common. Fairly catholic in its choice of habitats, and unlikely to be at any risk in the long term. Clearing of land for agriculture may have been beneficial to this species.

Bibliography. Anon. (1986), Archer & Godman (1937-1961), Ash & Miskell (1998), Atkins (1988), Bannerman (1953), Barlow *et al.* (1997), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Campbell (1989, 1990), Chapin (1953), Cheke & Walsh (1996), Clancey (1958b, 1964b, 1967a, 1990a), Dean (1974, 2000), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), van den Elzen (1975), Gatter (1997), Ginn *et al.* (1989), Gore (1990), Grimes (1987), Hall (1959), Harrison *et al.* (1997), Hockey *et al.* (1989), Hustler (1997), Jackson & Elgar (1993), Jellicoe (1954), Keith *et al.* (1992), Kopij *et al.* (2002), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Martin (1992), McAllister (1990), McCleland (1987), Mendelsohn (1984a, 1984b), Morel & Morel (1990), Nikolaus (1987), Pedersen (2000), Penry (1994), Rodwell *et al.* (1996), Salewski (2000), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Stevenson & Fanshawe (2002), Stjernstedt (2004), Tarboton (2001), Voelker (1999c), White (1948).

13. Long-tailed Pipit

Anthus longicaudatus

French: Pipit à longue queue **German**: Langschwanzpieper **Spanish**: Bisbita Colilargo

Taxonomy. *Anthus longicaudatus* Liversidge, 1996, Kimberley, South Africa.
Monotypic.

Distribution. Little known. Occurs in austral winter in C South Africa: observed in Kimberley area (E Northern Cape-W Free State), and recorded also from near Colesberg (S of R Orange) and Beaufort West (E Western Cape). Probably breeds farther N, on Barotse floodplains in Zimbabwe.



Descriptive notes. 15-16 cm; 30·2-34 g. Medium-sized to large, plain-backed pipit. Has broad off-white supercilium and submoustachial stripe, dark eyestripe, narrow dark moustachial and malar stripes; ear-coverts grey-brown, bordered black at rear; above, plain darkish grey-brown with pale feather edgings; wing feathers dark brown with pale edgings; tail dark brown, outer feather with tip and outer web buff to creamy; upper throat whitish, lower throat to upper belly white with indistinct brownish spots, lower belly, flanks and undertail-coverts brownish to brownish-white; iris dark brown; bill darkish horn, lower mandible paler with dark tip; legs horn-brown. Distinguished from similar *A. vaalensis* and *A. leucophrys* by darker back, longer darker tail, shorter bill, longer tarsus, shorter hind claw; in the hand, primary P9 equal to P6, rather than P7 or P8. Voice. Single note uttered when flying away; unlike e.g. *A. leucophrys*, call not polysyllabic.

Habitat. Breeding habitat unknown. In non-breeding area occurs on short dry grassland, including urban parks and playing fields.

Food and Feeding. Diet not known. Forages on ground in grass, as other pipits. In non-breeding area occurs in flocks of 10-40 individuals, often with *A. vaalensis*, *A. cinnamomeus* and *A. similis*; differs from them in horizontal, rather than upright, posture, and exaggerated tail-wagging behaviour.

Breeding. Unknown.

Movements. Uncertain. Believed to migrate from presumed breeding grounds in Zimbabwe (Barotse floodplain) S to South Africa; non-breeding area probably from NE Northern Cape and W Free State S to R Orange. Passage S through Kimberley occurred in early May 1999, but recorded at Kimberley as early as Feb.

Status and Conservation. Not globally threatened. Data-deficient. Very poorly known species, only recently described. Unknown away from the Kimberley playing fields and surrounding farms. Fieldwork required in this region and in neighbouring areas, including countries bordering South Africa, in order to determine the species' breeding range and the extent of its non-breeding range.

Bibliography. Anon. (1997e, 1997f, 1997g), Atkinson (1997), Harrison *et al.* (1997), Hockey (1997b), King (1997), Liversidge (1996, 1998), Louette & Prévost (1987), Martin (1992), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Tarboton (2001), Voelker (1999a, 1999b, 1999c), Voelker & Edwards (1998).

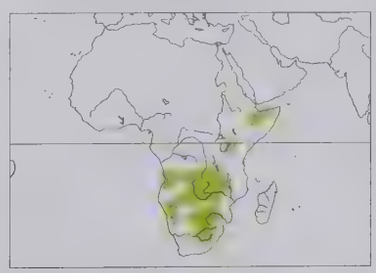
14. Buffy Pipit

Anthus vaalensis

French: Pipit du Vaal **German**: Vaalpieper **Spanish**: Bisbita del Vaal
Other common names: Sandy (Plain-backed) Pipit

Taxonomy. *Anthus vaalensis* Shelley, 1900, Newcastle, KwaZulu-Natal, South Africa.
Was in the past confused with *A. leucophrys*; NE races *saphiroi* and *goodsoni* still included in that species by some authors. Race *chobiensis* possibly better merged with *neumanni*, and *marungensis* possibly indistinguishable from either of those two. Proposed race *daviesi* (Eastern Cape, South Africa) included in nominate, and *muhingae* (SE DRCongo) in *neumanni*; birds of SE Botswana and NE South Africa sometimes separated as race *clanceyi*. Geographical limits of races difficult to establish; boundaries between listed ranges tentative. Eight subspecies provisionally recognized.

Subspecies and Distribution.
A. v. saphiroi Neumann, 1906 - SE Ethiopia and NW Somalia.
A. v. goodsoni Meinertzhagen, 1920 - C & SW Kenya and extreme N Tanzania.
A. v. neumanni Meinertzhagen, 1920 - Angolan plateau and SC & S DRCongo; moves S to Namibia and Botswana in the rains.
A. v. chobiensis (Roberts, 1932) - SE DRCongo and W Tanzania S to SE Angola, extreme NE Namibia, N Botswana, Zimbabwe and adjacent Mozambique.
A. v. marungensis Chapin, 1937 - N Zambia E to S Tanzania.
A. v. namibicus Clancey, 1990 - NE & C Namibia.
A. v. exasperatus Winterbottom, 1963 - NE Botswana; migrates to W Zimbabwe.
A. v. vaalensis Shelley, 1900 - S Botswana E to S Mozambique, NE South Africa and W Lesotho.



Descriptive notes. 15-18·5 cm; 23-36·6 g. Large pipit with plain upperparts. Nominate race has broad buff supercilium, dusky lores, sandy-brown ear-coverts, dark brown moustachial stripe and narrow malar stripe; sandy brown above, faint dark streaking on head; remiges and wing-coverts brown, tertials and greater and median wing-coverts with broad buff edges and tips, lesser coverts sandy brown; tail dark brown, T5 with buff tip and outer edge, T6 with pale buff outer web and distal part of inner web; pale sandy buff below, paler on chin and throat, darker on breast, upper breast indistinctly streaked greyish-brown; underwing-coverts and axillaries pale buff; iris dark brown; bill dark brown, pinkish base of lower mandible; legs pale yellowish-brown, hind claw relatively short (less than 11 m). Distinguished

On following pages: 15. Long-legged Pipit (*Anthus pallidiventris*); 16. Nilgiri Pipit (*Anthus nilghiriensis*); 17. Upland Pipit (*Anthus sylvanus*); 18. Berthelot's Pipit (*Anthus berthelotii*); 19. Malindi Pipit (*Anthus melindae*); 20. Striped Pipit (*Anthus lineiventris*); 21. Yellow-tufted Pipit (*Anthus crenatus*).

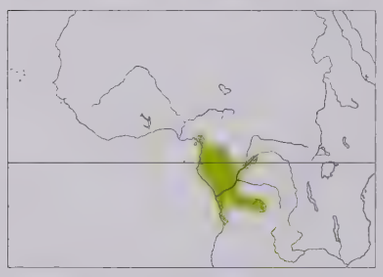
with difficulty from *A. leucophrys* by somewhat paler plumage, pinkish (not yellowish) on lower mandible, shorter and more curved hind claw. Sexes alike. Juvenile is browner above than adult, feathers edged pale buff, distinct dark spotting on breast. Race *saphiroi* is more warm brown above, extensively sandy buff below, more distinct streaks on breast; *goodsoni* is generally paler and browner above, sandier wing edgings than nominate, paler below; *marungensis* is larger, greyer above and more rufous-buff below than previous, has faint dusky spots on breast; *neumanni* is smaller, less deeply coloured than previous, slightly darker and browner above and deeper buff below than nominate; *chobiensis* is smaller than nominate, less sandy and more vinaceous above, with wing-coverts and underparts more cinnamon-buff; *namibicus* is dark, more blackish above, underparts paler and more vinous-buff; *exasperatus* is smaller than nominate, with upperparts colder and greyer. Voice. Song a series of very high rapid "trowhee" with well-spaced phrases; also described as rather dry and monotonous notes, "chrep, chiri, chree, chreu", regularly spaced at c. 1-second intervals; very similar to song of *A. nyassae*. Call "chik", "chipip" or "chipipip".
Habitat. Open grassland and overgrazed areas with bare ground, fallow land, recently burnt areas and edges of pans; may also use clearings in open woodland. Occurs in generally drier habitats than *A. leucophrys* in those areas where the two overlap in range. Ranges from lowlands up to at least 1700 m.
Food and Feeding. Insects and other invertebrates; also seeds. Beetles (Coleoptera), grasshoppers (Orthoptera), ants (Hymenoptera), termites (Isoptera) and caterpillars (Lepidoptera) are important prey. Of 67 stomachs examined in Zimbabwe, 76% contained coleopterans, 69% orthopterans, 34% hymenopterans, 18% bugs (Hemiptera), 19% lepidopterans, 24% termites, 3% flies (Diptera), 4% dragonflies and damselflies (Odonata), 6% myriapods, 3% Dictyoptera, 6% arachnids, 7% seeds; feathers and grit found in, respectively, 6% and 5% of stomachs. Forages on the ground while walking.
Breeding. Lays before or during rains in S Africa, Jun-Oct in Zambia, Jul-Feb (mainly Sept-Dec) in Zimbabwe, Aug-Dec in South Africa. Monogamous; territorial. Nest a large, loosely built cup of coarse grass, with lining of finer grasses and rootlets, hidden in depression at base of grass tussock or rock. Clutch 2-3 eggs; incubation and fledging periods unknown.
Movements. Little known; some populations thought to be sedentary, and others to make regular movements. Some S populations believed to be nomadic, especially during austral winter. Races *chobiensis* and *neumanni* possibly migrate to S Africa after breeding.
Status and Conservation. Not globally threatened. Status not well known; apparently uncommon to locally common. May have benefited from the clearance of land for agriculture and stock grazing. No obvious threats.
Bibliography. Archer & Godman (1937-1961), Atkins & Johnston-Stewart (1989), Benson & Benson (1977), Benson *et al.* (1971), Borrett (1969b), Borrett & Wilson (1971a), Campbell (1989, 1990), Chapin (1953), Clancey (1960a, 1964b, 1968a, 1990a), Dean (1978, 2000), Frost & Siegfried (1975), Ginn *et al.* (1989), Hall (1959), Harrison *et al.* (1997), Keith *et al.* (1992), Liversidge (1998), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Newman *et al.* (1992), Pedersen (2000), Penry (1994), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Stevenson & Fanshawe (2002), Stjernstedt (2004), de Swardt (1990a), Tarboton (2001), Voelker (1999c), White (1948), Winterbottom (1963).

15. Long-legged Pipit

Anthus pallidiventris

French: Pipit à longues pattes **German**: Stelzenpieper **Spanish**: Bisbita Patilargo

Taxonomy. *Anthus pallidiventris* Sharpe, 1885, Gabon.
Race *esobe* intergrades with nominate in region of Bolobo, on middle R Congo. Two subspecies recognized.
Subspecies and Distribution.
A. p. pallidiventris Sharpe, 1885 - SW & S Cameroon S to N Angola (S to W Cuanza Sul and Lunda Sul).
A. p. esobe Chapin, 1937 - middle Congo Basin.



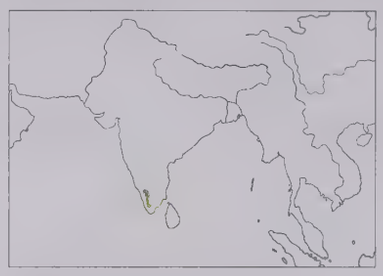
Descriptive notes. 18 cm. Large, plain-backed pipit with long legs and bill, long hind claw, and upright stance. Nominate race has prominent whitish supercilium, brown lores and ear-coverts with pale buff flecks, and dark brown moustachial stripe; overall greyish-brown above, slightly streaked on head; remiges dark brown, tertials and greater and median wing-coverts are dark brown with buff tips and edges, lesser coverts brown; tail blackish-brown, with T5 buffish-brown with pale edges and tip, and T6 buffish-brown; whitish below, breast washed with greyish-buff and with indistinct brown streaking, flanks pale buff; underwing-coverts and axillaries brownish-white; iris blackish; bill brown, with conspicuous yellow base of lower mandible; legs pale brown. Sexes alike. Juvenile is more streaked on crown than adult, supercilium buff, feathers of upperparts and wings tipped and fringed tawny, breast mottled black. Race *esobe* differs from nominate in having darker and more grey-brown upperparts, more pronounced breast streaking. Voice. Song a repeated "tit-tidii". Contact call "psip"; flight call liquid "poui-titit"; husky "ptic-ptic".
Habitat. Patches of natural grassland, including forest clearings, as well as pastures, grassland and bare ground in and around villages and towns, and cultivated land; also airfields.
Food and Feeding. Food arthropods, such as small grasshoppers (Orthoptera), other small flying insects, and spiders (Araneae). Forages on the ground, running to pick insects from ground surface and low vegetation; jumps up to catch flying insects. Walks and runs with upright stance, constantly wagging tail up and down.
Breeding. Little information. Laying in May and Jul-Aug in Gabon; eggs in Aug in PRCongo; nestling in Jan in DRCongo, but possibly breeds also May-Jul, at end of rains; gonadal condition of specimens indicates breeding probably in Sept-Oct in N Angola (Cabinda). No other information.
Movements. Apparently resident over much of range, but thought to be locally nomadic in non-breeding season.
Status and Conservation. Not globally threatened. Locally common; more widely distributed than was previously thought. Has recently extended its range NW from Gabon to SW Cameroon, and two possible sightings in SE Nigeria; expansion possibly a result of deforestation. Will forage close to human habitations and on other man-altered habitats; unlikely to be at any risk in foreseeable future.
Bibliography. Bannerman (1953), Borrow & Demey (2001), Brosset & Érard (1986), Christy & Clarke (1994), Clancey (1990a), Dean (2000), Dean *et al.* (2003), Demey (2003), Demey *et al.* (2000), Dowsett (1989), Dowsett & Dowsett-Lemaire (1991), Fishpool & Evans (2001), Keith *et al.* (1992), Lippens & Wille (1976), Mackworth-Praed & Grant (1963, 1973), Pedersen (2000), Traylor (1963), White (1951).

16. Nilgiri Pipit

Anthus nilghiriensis

French: Pipit des Nilgiri **German**: Nilghiripieper **Spanish**: Bisbita de los Nilgiri

Taxonomy. *Anthus nilghiriensis* Sharpe, 1885, Nilgiri Hills, southern India.
Initially named as *A. rufescens*, but that name invalid. Monotypic.
Distribution. Western Ghats in Kerala and W Tamil Nadu, in extreme SW India.



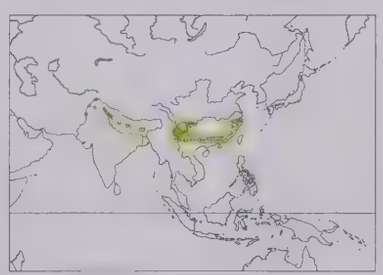
Descriptive notes. 17-17·5 cm. Richly coloured pipit with heavy streaking. Has broad deep buff to whitish supercilium, darker buff ear-coverts, sometimes some dark spots in malar region; crown and upperparts tawny-olive or warm grey-brown with greenish-yellow tinge, crown to mantle and scapulars heavily streaked blackish-brown, back to uppertail-coverts streaked grey-brown; remiges and wing-coverts dark brown, edges and tips dull dark buff to greenish-yellow (forming two wingbars); tail dark brown, outer two feather pairs with prominent whitish wedges; throat, breast and flanks deep buff, belly paler buff, blackish-brown streaks on breast and flanks; iris dark brown; bill blackish, lower mandible with greyish-pink base; legs pale pink or yellowish-pink. Distinguished from *A. rufulus* by shorter tail, more boldly streaked crown and mantle, more distinct buffish supercilium, richer buff underparts with bolder markings, no malar stripe. Sexes alike. Juvenile is generally paler than adult, with more distinct streaking. Voice. Song, usually from ground, feeble, initially quiet and hesitant, accelerating into trill, "tsip tsip tsip-tsip-sip-sip-sipsipsipsipsip" and ending abruptly. Call a weak "see see", unlike that of *A. rufulus*.
Habitat. Upland grassland, open grassy and rocky areas on tops of hills; favours short grass. Also in coffee plantations. Occurs at 1500-2300 m; down to 1000 m in Panmudi Hills. In Nilgiri Hills, replaces *A. rufulus* above 1800 m (although some overlap).
Food and Feeding. Small invertebrates. Forages on ground, in short grass; when disturbed, flies to nearest bush or tree.
Breeding. Season end Mar/early Apr to Jul. Nest a shallow cup of coarse grass and roots, lined with finer grass, sometimes hair and stems, built among roots or in tuft of grass or in depression at base of bush on open hillside or bank. Clutch 2-4 eggs; no further information.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Western Ghats EBA. Locally fairly common to common in Nilgiri Hills, Palni Hills and High Range, and in Panmudi Hills. Total range, however, is small, and its grassland habitats are gradually being converted to plantations of tea, gum (*Eucalyptus*) and wattle (*Acacia dealbata*). Further deterioration and loss of habitat could place this species at risk.
Bibliography. Ali (1969), Ali & Ripley (1998), Alström & Mild (2003), Baker & Inglis (1930), Beadnell (1936), Collar *et al.* (2001), Daniels (1997), Grimmett *et al.* (1998), Kazmierczak (2000), Martens & Eck (1995), Ripley (1982), Stattersfield & Capper (2000), Zacharias & Gaston (1999).

17. Upland Pipit

Anthus sylvanus

French: Pipit montagnard **German**: Mattenpieper **Spanish**: Bisbita del Himalaya
Other common names: Indian/Oriental/Chinese Pipit

Taxonomy. *Heterura sylvana* Hodgson, 1845, central Nepal.
Slightly paler and less streaked birds from W part of range (Punjab region) described as race *oreinus*, but variation considered part of a cline. Monotypic.
Distribution. From NW & N Pakistan (possibly from E Afghanistan) E in Himalayas at least to E Nepal, and in S & SE China (W & S Sichuan and from Yunnan E to Zhejiang and Fujian, also Hong Kong); possibly also N & NE Myanmar.



Descriptive notes. 17 cm; 18·7 g. Large, streaked pipit with stout, relatively short bill. Has creamy supercilium, indistinct dark moustachial stripe and malar stripe; grey-brown above, mantle and scapulars more buffy, boldly streaked blackish-brown; wing feathers with narrow sandy edges; tail dark grey-brown, outer three feather pairs with pale wedge on inner webs, outer two pairs with mostly whitish outer webs; upper throat and belly buffish-white, rest of underparts pale buff, prominent blackish-brown streaks on breast and flanks, fine streaks on undertail-coverts; iris dark brown; upper mandible blackish, lower mandible pale pinkish with dark tip; legs pale pinkish. Differs from *A. richardi* in having more boldly streaked upperparts, more extensive and narrower streaks on breast and belly, stouter bill. Sexes alike. Juvenile has prominent pale buffish feather tips and edges above, giving scaly appearance, whiter underparts with streaks paler. Voice. Song, from prominent feature (e.g. rock, bush, tree) or in flight, a repeated "seetyu-seetyu" with stress on first syllable or "tyu-see, tyu-ee" with stress on second syllable, not unlike a Great Tit (*Parus major*) song; also described as rather pleasant but monotonous "weeeee tch weeeee tch" or drawn-out whistling "wichee wichee wichee", likened to that of some buntings (*Emberiza*); unlike songs of other members of genus. Call, infrequently given, a "chirp" like that of a sparrow (*Passer*), unlike high-pitched notes of other pipits.
Habitat. In breeding season occurs on steep rocky and grassy slopes with scattered bushes or rocks, also on abandoned terrace cultivation; often associated with chir pine (*Pinus roxburghi*) or scattered blue pine (*P. wallichiana*) in drier foothills of Pakistan, and found in open *Pinus longifolia* forest in India. Breeds mostly at 1200-3000 m, but to 2300 m in Pakistan, and locally down to 900

m in N India (Himachal Pradesh), and locally down to 500 m in S China (Hong Kong). In similar habitats in winter, but generally at lower elevations (down to c. 900 m).
Food and Feeding. Little known. Small invertebrates. Feeds on the ground, creeping in horizontal posture. When disturbed, often adopts upright stance and makes tail-flicking movements.
Breeding. Breeds Mar-Jul. Occasional brief song flight, rising a short distance and then parachuting downwards on partly spread wings. Nest a cup of coarse grass, lined with finer grass, well hidden under tuft of grass or rock. Clutch 3-5 eggs; incubation and fledging periods not documented. Nests occasionally parasitized by Common Cuckoo (*Cuculus canorus*).
Movements. Resident; some altitudinal movements. In winter, descends from highest areas of Himalayas, down to 900 m, and in Nepal occurs at 1350-2000 m in non-breeding season. Apparently resident in mountains of China.
Status and Conservation. Not globally threatened. Widespread and locally fairly common in India, Nepal and China. Scarce to rare and localized in Pakistan, where occurs in only a few areas in N & W (S to Sulaiman Range, in Baluchistan). Not well known.
Bibliography. Ali (1979), Ali & Ripley (1998), Alström & Mild (2003), Carey *et al.* (2001), Cerny (1988), Cheng Tsohsin (1987), Dhinsa & Sandhu (1988), Étchécopar & Hüe (1983b), Grimmett *et al.* (1998, 2000), Hüe & Étchécopar (1970), Kazmierczak (2000), King *et al.* (1975), La Touche (1931-1934), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Ripley (1982), Roberts (1992), Shrestha (2000), Smythies (1986).

18. Berthelot's Pipit

Anthus berthelotii

French: Pipit de Berthelot **German**: Kanarenpieper **Spanish**: Bisbita Caminero
Other common names: Canarian/Canary Islands Pipit

Taxonomy. *Anthus Berthelotii* Bolle, 1862, Canary Islands.
Relationships uncertain; believed to be closest to *A. campestris*, but behavioural aspects suggest possible affinities with *A. similis*. Race *madeirensis* sometimes subsumed in nominate. Birds from Lanzarote, described as race *lanzaroteae*, considered indistinguishable from nominate. Two subspecies recognized.
Subspecies and Distribution.
A. b. madeirensis Hartert, 1905 - Madeira Archipelago (Madeira, Desertas and Porto Santo, reported also from Baixo I).
A. b. berthelotii Bolle, 1862 - Selvagens and Canary Is.



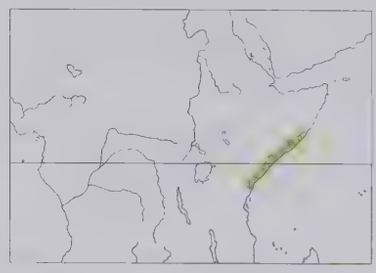
Descriptive notes. 14 cm; 16-19 g. Has long white supercilium, unstreaked pale lores and cheeks, dark brownish-grey moustachial and malar stripes; crown and upperparts ashy brown, black streaks on head, dark brown streaks on mantle and back, plain lower back and rump, uppertail-coverts warmer brown with slight streaking; primaries, secondaries and primary coverts dark brown with narrow white edges, tertials and greater wing-coverts paler with broad sandy-buff edges and tips, median coverts blackish-centred with broad buff-white tips (forming wingbar), lesser coverts sandy brown; tail blackish-brown, T5 with outer web and much of distal inner web white, T6 white; whitish below, breast tinged pink or buff and streaked dark grey-brown, flanks and undertail-coverts usually thinly streaked dark; colour of underparts varies according to soil type (plumage becomes earth-stained); iris dark brown; upper mandible grey, lower mandible pale pink; legs pale pink or yellowish-pink. Sexes alike. Juvenile has broader and clearer streaks above, pale feathers edgings giving scalloped appearance, back, rump and uppertail-coverts more rufous, greater contrast on wings, more spotted than streaked below. Race *madeirensis* has longer and stouter bill than nominate. Voice. Song, from elevated perch or in flight, pleasant and cheerful series of "tschrli", "truit", "tsliu" or "tsiree", notes separated by pauses of 1-2 seconds. Main calls "zichéé" or "sliréé" when flushed, also low hoarse "tiuee", "chiriree", "tschir", "tchik", "sleeoo" and similar; "tsrl" contact call at nest. All vocalizations similar to those of *A. campestris*.
Habitat. Occurs in all habitats except thick woodland and moister parts, from sea-level to over 2000 m. In E Canaries, prefers dry, sparsely vegetated semi-desert areas of volcanic rock and other open places, such as tracks; occurs on rock-strewn hillsides on more mountainous W islands. In Madeira, most frequent in high serras but occurs also on cliffs and in fields near sea.
Food and Feeding. Food mainly insects, such as grasshoppers and crickets (Orthoptera) and caterpillars (Lepidoptera), also other arthropods, and seeds. Stomachs contained small ants (Hymenoptera), spiders (Araneae), flies (Diptera), lepidopteran pupae, and weed seeds; others were full of large plant seeds. Forages on the ground, pecking among grass or stones, or rushing forward to pick active prey, or occasionally making brief aerial sally. Has habit of running along ground, rarely flying far, and standing upright.
Breeding. Late Jan-Aug, starting later at higher altitudes; probably double-brooded. In song flight, rises to 30 m or more, flies with deep undulations in irregular circles, drops steeply or in angled glide. Nest a cup of dry grass and roots, occasional feather incorporated, lined with hair, wool and/or feathers, built in shelter of small bush or stone. Clutch 2-5 eggs, mainly 3-4; incubation and fledging periods not documented.
Movements. Resident; no evidence of seasonal altitudinal movements.
Status and Conservation. Not globally threatened. Restricted-range species: present in Madeira and the Canary Islands EBA. Common in suitable habitat, where one of the most numerous bird species in its range. Canaries population comprises 15,000-20,000 individuals; Madeiran race estimated at c. 500-1000 breeding pairs. Population considered stable. No known threats at present, but any future large-scale developments may impinge on its habitats.
Bibliography. Alström & Mild (1993, 2003), Arctander *et al.* (1996), Bannerman (1963), Bannerman & Bannerman (1965), Bourne (1995), Clarke & Collins (1996), Collins (1984), Concepción (1992), Cramp (1988), Dunn (1994), Ennion & Ennion (1962), Étchécopar & Hüe (1964), Folmer & Ortvad (1992), Hagemeijer & Blair (1997), Hammer (1993), Heath & Evans (2000), Heath *et al.* (2000), Hildén & Hildén (1995), Juergens (2002), Lorenzo & Barone (2003), Martín & Lorenzo (2001), Snow & Perrins (1998).

19. Malindi Pipit

Anthus melindae

French: Pipit de Melinda **German**: Malindipieper **Spanish**: Bisbita de Malindi

Taxonomy. *Anthus melindae* Shelley, 1900, Malindi, Kenya.
Possibly related to *A. cinnamomeus* and *A. pseudosimilis*. Two subspecies recognized.
Subspecies and Distribution.
A. m. mallablensis Colston, 1987 - coast of S Somalia from 30 km NE of Mogadishu S to c. 1° N.
A. m. melindae Shelley, 1900 - S Somalia (S from lower R Juba and lower R Shabelle and, on coast, from Mogadishu) S to coastal Kenya (S to lower Tana Valley and Mombasa).



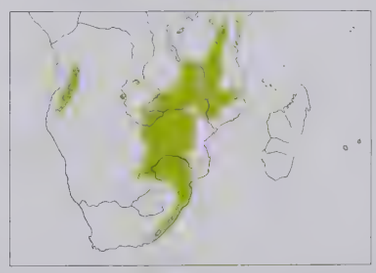
Descriptive notes. 14·5-16 cm; 19-27 g. Large, distinctive, long-legged pipit. Has whitish supercilium, brown lores, moustachial area and eyestripe, broad buff line below eye to ear-coverts, prominent dark brown malar stripe; earth-brown above, streaked dark brown on top of head, indistinctly mottled with dark brown on mantle; remiges and upperwing-coverts dark brown, tertials and greater coverts edged rich buff, median coverts and alula edged whitish (indistinct wingbar); tail blackish-brown, T5 tipped whitish, T6 pale brown with whitish tip and outer edge; whitish below, more greyish-buff on breast and flanks, brown streaking on breast, less so on flanks; underwing-coverts and axillaries greyish-brown; iris dark brown; bill dark horn, bright yellowish-flesh base of lower mandible; legs bright yellowish flesh-coloured. Sexes alike. Juvenile is darker and browner above, feathers of upperparts and wing-coverts narrowly edged whitish. Race *mallablensis* is smaller than nominate and has lighter brown head and upperparts. Voice. Song, from perch usually 1-1·5 m above ground, a jangling "creer", "kwee" or "kuree" repeated at 1-second intervals. Commonest call, in flight, a "tsweep" like that of *Motacilla flava*; also "tweet-tweet" and "tirrip-tirrip-tirrip".
Habitat. Low-lying coastal or riparian grassland, subject to seasonal flooding, which is well grazed or seasonally burnt. In Somalia, occurs in open lowland country, fixed dunes, cultivations and wetland edges.
Food and Feeding. Small invertebrates. Items taken from the ground or from the base of grass stems; locusts (Orthoptera) sometimes caught in the air. Observed to carry locusts to tracks and to thrash or dismember the insects on the firm surface. Usually seen singly, in pairs, or in small groups or loose flocks of up to 20 individuals.
Breeding. Laying during the rains, Apr-Jun, in Kenya; one record of two half-grown nestlings in early Jun in Somalia. Monogamous; territorial. Nest a deep thick-walled grass cup, attached to growing grass, in grass tussock; depth and thickness of nest possibly a strategy to protect eggs and young from temporary flooding. Clutch 2-3 eggs; incubation and fledging periods not documented.
Movements. Apparently resident; some local dispersive movements. May be an occasional wanderer in Kenya S of Ras Ngomeni.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Locally common to abundant in most of range; rare in Kenya S of R Sabaki. In Kenya, 4-5 birds/ha, or c. 2 pairs/ha, found in littoral grassland at Kampi ya Waya (N of R Sabaki) in May 1976; density may be higher, as 4 nests and a pair feeding flightless young found in area of less than 1 ha in May-Jun 1976, alongside *Tmetothylacus tenellus*, *Macronyx aurantiigula* and *A. cinnamomeus*. Any cessation of grazing or burning could render grassland habitats unsuitable, as this species avoids rank grassland. Moreover, growing demand for arable and grazing land is placing increasing pressure on diminishing wetlands in much of its small range; high levels of grazing pose additional threat.
Bibliography. Ash & Miskell (1998), Bennun & Njoroge (1999), Bliss (1997), Britton & Britton (1978), Brown & Britton (1980), Clancey (1990a), Collar *et al.* (1994), Colston (1982a, 1982b, 1987), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fanshawe & Bennun (1991), Fishpool & Evans (2001), Hall & Moreau (1970), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Muriuki *et al.* (1997), Pearson (1990), Short *et al.* (1990), Stattersfield & Capper (2000), Stevenson & Fanshawe (2002), Taylor (1983), Turner (1991), White (1961a), Zimmerman *et al.* (1996).

20. Striped Pipit

Anthus lineiventris

French: Pipit de Sundevall **German**: Streifenpieper **Spanish**: Bisbita Rayado
Other common names: Large Striped Pipit

Taxonomy. *Anthus lineiventris* Sundevall, 1850, Mohapoani, Limpopo River, Botswana.
Was previously sometimes thought to form a superspecies with *A. crenatus*, but the two species differ widely in plumage characters and ecology. Described race *sylvivagus* included in nominate and *angolensis* (from Angola) in *stygium*; furthermore, *stygium* considered by some authors to be indistinguishable from nominate. Two subspecies recognized.
Subspecies and Distribution.
A. l. stygium Clancey, 1952 - W Angola, and disjunctly from NW & W Tanzania, SE Kenya (Taita Hills, Chyulu Hills), SE DRCongo and W, E & S Zambia S to NE Botswana, Zimbabwe, N, W & S Mozambique and coastal E South Africa.
A. l. lineiventris Sundevall, 1850 - SE Botswana E to NE South Africa and W Swaziland.



Descriptive notes. 17-18 cm; male 30·3-35·3 g, female 31·8-37·3 g, unsexed 29·9-38 g. Large pipit with distinctive greenish edges of wing feathers, heavily streaked underparts. Nominate race has long, narrow buff supercilium, dark brown lores and ear-coverts with buff flecking, narrow dark malar stripe; above, pale olive-brown with dark brown streaking, streaks less distinct on back and rump; remiges, primary coverts and alula dark brown with yellowish-green edging, tertials and rest of upperwing-coverts tipped and edged olive-brown; tail dark brown, T4 tipped white on inner web, T5 with white distal third of inner web, T6 white except for base of inner web (white on outer tail conspicuous in flight); whitish to pale buff below, fine dark brown streaks on side of throat, broad blackish streaks on breast, streaks longer and finer on flanks, belly side and undertail-coverts; underwing-coverts and axillaries greyish-buff, streaked darker, tinged bright yellow on carpal; iris brown; bill dark brown above, lower mandible horn-coloured; legs light flesh-brown. Sexes alike. Juvenile is paler than adult, and more spotted above. Race *stygium* is darker above than nominate, has whiter ground colour of underparts, darker breast and flank streaking. Voice. Generally silent. Song loud, high-pitched, rich and melodious, with whistled phrases, rather like that

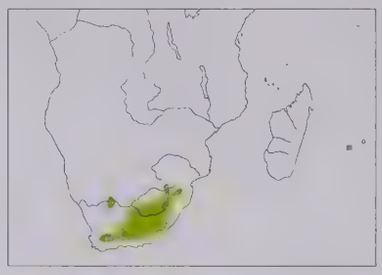
of Common Wren (*Troglodytes troglodytes*), sometimes given in short bursts, sometimes in long continuous series of forcefully repeated phrases interspersed with long vibrant trills.
Habitat. Rocky wooded hillsides and grassy mountain slopes with rock outcrops and scattered trees and bushes; in Zambia, Malawi and Zimbabwe mainly in areas of *Brachystegia* woodland with rocks beneath; miombo woodland with rocks in Angola. Mostly to 2000 m, but to 2200 m in E Zimbabwe; mainly 1000-1250 m in Malawi, but down to 800 m in extreme S (Mulanje); occurs as low as 150 m in coastal hinterland of NE South Africa.
Food and Feeding. Arthropods; grasshoppers (Orthoptera) recorded. Forages on ground among and over rocks. Often perches in trees.
Breeding. Laying in Nov in Tanzania, Sept-Oct in Malawi and Mozambique, and Sept-Jan in Zimbabwe and South Africa; birds in breeding condition in Nov-Dec in Angola and in Nov in Zambia. Monogamous; territorial. Nest a cup of grass and leaves, lined with finer grasses and rootlets, placed on ground, often near tussock or against rock. Clutch 2-3 eggs, occasionally 1, average of 14 clutches 2·8; incubation and fledging periods, and roles of sexes, unknown.
Movements. Resident and migratory. Tropical populations probably largely sedentary, although some altitudinal movements may occur. Seasonal influxes into S Mozambique and E South Africa (NE KwaZulu-Natal) thought to involve migrants from farther S. Individuals exhibiting features of nominate race (breeding in Northern Province of South Africa) have been found in E highlands of Zimbabwe.
Status and Conservation. Not globally threatened. Widespread. Locally distributed and generally scarce in Tanzania and SE Kenya; locally common in Angola and Botswana and in other parts of range, but generally restricted by habitat. No evidence of any decline, but conservation of broadleaf woodlands, especially of *Brachystegia* miombo woodland in Zimbabwe, is essential. Fortunately, rocky hills where it occurs are largely unsuitable for agriculture.
Bibliography. Benson & Benson (1977), Benson *et al.* (1971), Campbell (1989), Clancey (1952a, 1959a, 1964b, 1968b, 1979, 1984d, 1996), Dean (2000), Fuggles-Couchman (1986), Ginn *et al.* (1989), Godfrey (1932), Hanmer & Chadder (1993), Harrison *et al.* (1997), Hickling (1983), Keith *et al.* (1992), Lawson (1965a), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Newman (1970), Parker (1999), Pedersen (2000), Pedersen & Herroelen (1998), Penry (1994), Roberts (1925), Short *et al.* (1990), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Smart (1999), Snell (1963b), Stevenson & Fanshawe (2002), Steyn (1996), Stjernstedt (2004), Stutterheim (1978), Swynnerton (1911), Tarboton (2001), Terblanche (1997), Vernon (1973, 1985), Voelker (1999c), Weghe (1993), Williams (1997).

21. **Yellow-tufted Pipit**

Anthus crenatus

French: Pipit des rochers **German**: Klippenpieper **Spanish**: Bisbita Roquero
Other common names: Rock Pipit(!), African Rock Pipit, Large Yellow-tufted Pipit

Taxonomy. *Anthus crenatus* Finsch and Hartlaub, 1870, near Cape Town, South Africa.
Was previously sometimes thought to form a superspecies with *A. lineiventris*, but the two species differ widely in plumage characters and ecology. Monotypic.
Distribution. South Africa from S & E Northern Cape E in mountains to Mpumalanga, W Swaziland and Lesotho (Drakensberg); also, isolated population in NC Northern Cape (lower R Orange).



Descriptive notes. 17-18 cm; 29-32·5 g. Large, stocky, plain-backed pipit with heavy bill and legs, distinctive yellow edgings on wings. Has prominent buffish supercilium extending behind eye, olive-brown lores and ear-coverts with fine buff streaking, indistinct narrow dark brown malar stripe; plain olive-brown above, slight dark streaking on top of head, greyer side of neck; wings brown, yellowish-green edges of primaries, secondaries and alula, olive-green edges of tertials and greater wing-coverts; tail dark brown with narrow yellowish-green edging, outermost rectrix with outer edge pale and inner web tipped whitish; chin and throat whitish, rest of underparts rich buff, indistinctly streaked brown on breast, dark brown undertail-coverts broadly tipped buff; underwing-coverts and axillaries buff, broadly tipped yellowish-green; iris hazel; bill dark brown, yellowish basal half of lower mandible; legs pale brown. Sexes alike. Juvenile undescribed. VOICE. Song, from perch or in flight, a series of sweet disyllabic phrases repeated several times, second note rather trilled and falling in pitch, "whee-tsreeee, whee-tsreeee"; also a slower, more quavering "whee-pr-rreeu".
Habitat. Mountains and karroid terrain (kopjes and dry stony hills), mainly above 1000 m, in S & W of range; in E, alpine grassland with rock outcrops and boulders, to 3000 m.
Food and Feeding. Diet little known. Recorded items include spiders (Araneae), grasshoppers (Orthoptera) and grass seeds (Gramineae). Forages on the ground, running among stones or creeping in grass, pecking at invertebrates. Usually singly or in pairs.
Breeding. Few records. Laying during summer rains in Oct-Mar, mainly Nov-Jan; once in Aug in SW (winter-rainfall area). Monogamous; territorial. Male sings from rock perch, in upright posture with bill pointing up, sometimes in aerial display. Nest a cup of grass and roots, lined with finer grasses, built on ground under grass tuft, by rock or under overhanging rock on hillside. Clutch 3-4 eggs; incubation period at least 12-13 days; chicks fed by both parents, nestling period at least 11 days; injury-feigning display by adult observed.
Movements. None known; apparent lack of seasonal gregariousness suggests strictly sedentary lifestyle.
Status and Conservation. Not globally threatened. Widely distributed and fairly common in suitable habitat; especially common in Lesotho, where reported as being one of the commoner terrestrial passerines. Apparent decline has occurred in SW of range, but the species is probably not under any threat as its habitat lies above the altitudinal and rainfall limits of crop agriculture. Grazing and seasonal burning of grassland may affect some populations.
Bibliography. Allan & Harris (1984), Allan *et al.* (1997), Bonde (1993), Burger (1990), Campbell (1989), Clancey (1964b, 1990a, 1990b), Dean & Siegfried (1997), Ginn *et al.* (1989), Godfrey (1934), Grobler (1986), Harrison *et al.* (1997), Keith *et al.* (1992), Kok (1996), Kriek *et al.* (1995), Mackworth-Praed & Grant (1963), Maclean (1993a), Martin, H. & Pepler (1997), Martin, R. & Pepler (1999), Martin, R. *et al.* (1985), Newman (1996), Nuttall (1996, 1997), Osborne & Tiggar (1990), du Plessis (1990), Porter (1986), Quickelberge (1972b), Siegfried (1992), Sinclair & Hockey (1996), Sinclair *et al.* (1993), de Swardt (2002), Tarboton (2001), Voelker (1999a, 1999b, 1999c), Wade (1994).

PLATE 73 ➤

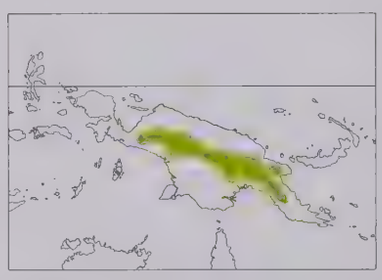


22. New Guinea Pipit

Anthus gutturalis

French: Pipit de Nouvelle-Guinée **German**: Papuapieper **Spanish**: Bisbita Papúa
Other common names: Alpine Pipit, Mountain Pipit(!)

Taxonomy. *Anthus gutturalis* De Vis, 1894, Mount Maneao, south-east New Guinea.
Three subspecies recognized.
Subspecies and Distribution.
A. g. wollastoni Ogilvie-Grant, 1913 - WC New Guinea.
A. g. rhododendri Mayr, 1931- EC New Guinea (in C highlands and Huon Peninsula).
A. g. gutturalis De Vis, 1894 - SE New Guinea.
Descriptive notes. 17-5-18 cm. Large pipit with strong facial pattern. Nominate race has dark brown lores, contrasting creamy supercilium and lower eyelid (giving spectacled appearance), brown ear-coverts; forehead whitish, crown, head side and upperparts blackish-brown, buffy olive-brown feather edgings giving streaked appearance, rump plainer olive-brown to buffy; wing feathers dark brown, edged buffish olive-brown; tail dark brown, edged grey, T5 tipped white, T6 brownish-white to buffy; throat to upper breast white to pale buff, rest of underparts buffy or pale brown, blackish-brown stripe or patch on side of throat and lower neck; iris dark brown; bill black; legs dark horn or pinkish. Sexes alike. Juvenile has blackish-brown streaks below. Race *rhododendri* is slightly smaller than nominate, and has greener upperparts and darker underparts; *wollastoni* has somewhat brighter plumage, but black at side of throat reduced to broken streaks or absent. Voice. Song, often in flight low over ground, described as several high, thin, clear notes each repeated several times before a new note, running into a trill, or a lower coarser trill and various subdued musical calls and whistles. Call faint and high-pitched "tsip" or "tsee", or "tsee tsee tsee"; also subdued musical notes and whistles.
Habitat. Alpine grassland above the tree-line on the highest mountains, between 3200 m and 4500 m, occasionally down to 2500 m. Prefers short grass, often near cover of shrubs.



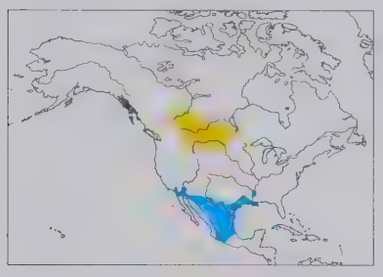
Food and Feeding. Mainly small insects and their larvae, and other arthropods; grass seeds, berries and green herbaceous matter also recorded. Forages on the ground, moving with a "waddling" gait. Sometimes up to ten individuals together. When alarmed, flies to a vantage point such as rock, bush or tree, up to 12 m away, at forest edge. Frequently holds the bill upwards at 45-degree angle.
Breeding. Single nestlings found in latter part of wet season, in Apr, Sept and Oct. Nest a cup of fine grass, placed on steep bank. No other information.
Movements. Resident; no evidence of descent to lower elevations in winter.
Status and Conservation. Not globally threatened. Restricted-range species: present in Adelbert and Huon Ranges EBA and Central Papuan Mountains EBA. No information on current status. Described as common in late 1960s and 1970s; no reason to suppose that any changes in its habitat or population level have taken place since then.
Bibliography. Andrew (1992), Beehler (1978), Beehler *et al.* (1986), Coates (1990, 2001), Coles (1976), Diamond (1972), Mayr (1941), Rand & Gilliard (1967), Sujatnika *et al.* (1995), Strange (2001).

23. Sprague's Pipit

Anthus spragueii

French: Pipit de Sprague **German**: Prärieпieper **Spanish**: Bisbita Llanero

Taxonomy. *Alauda Spragueii* Audubon, 1844, near Fort Union, North Dakota, USA. Molecular-genetic analyses suggest possible close relationship with *A. furcatus*, *A. hellmayri* and *A. bogotensis*. May form a clade with those and with *A. lutescens*, *A. correndera* and *A. antarcticus*. Monotypic.
Distribution. Breeds in S Canada (C & SE Alberta, C & S Saskatchewan, SW Manitoba) and N USA (N & C Montana, North Dakota, N South Dakota, NW Minnesota). Winters from S USA S to C Mexico.



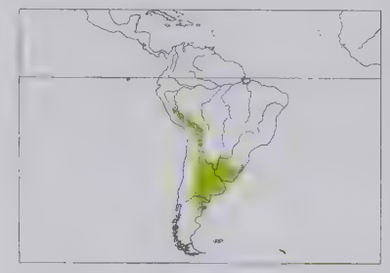
Descriptive notes. 15-17 cm; c. 25 g. Rather small, highly secretive pipit with strongly streaked upperparts. Has indistinct pale buffish supercilium, pale buffy grey-brown ear-coverts indistinctly streaked, faint dark malar stripe; above, pale grey-brown with buff to rufous tinge, streaked blackish-brown, streaks particularly prominent on forehead to mantle, paler feather tips forming two stripes on side of mantle (when plumage fresh); wings dark brownish, wing-coverts tipped whitish (two wingbars); tail dark brownish, T4 with white edge of outer web, T5 with mostly white outer web and long white wedge on inner web, T6 with outer and most of inner web white; throat pale buffish, breast and flanks warm buffish, breast and occasionally rear flanks streaked grey-brown, rest of underparts pale buffish-white; iris dark brown; upper mandible blackish, lower mandible pale pinkish with blackish tip; legs pale pinkish or pale brownish-yellow. Sexes alike. Juvenile has more obvious streaking on head and nape, pale feather edgings above giving scalloped appearance, more obvious white wingbars, whiter underparts with bolder and more rounded breast streaks. Voice. Song, almost always in flight, a musical series of thin, jingling phrases on descending scale, "ching-a-ring-a-ring-a ring-a". Calls an explosive squeaky "sweep" or "speep", often double notes, or, when flushed, "speep-beep-beep".
Habitat. Grassland and weedy fields on plains and prairies during summer; in non-breeding season, temperate grassland at up to 2500 m. Often forages in weed-grown fields during migration.
Food and Feeding. Small invertebrates, mainly insects such as grasshoppers and crickets (Orthoptera), ants (Hymenoptera), beetles (Coleoptera), bugs (Hemiptera) and larval and adult lepidopterans; also weed seeds. Forages on the ground, usually well concealed, rarely in open. Usually singly or in pairs; occasionally small groups outside breeding season.
Breeding. Laying in late May and Jun. Displaying male ascends to over 100 m, circles and sings with tail spread, then plunges, wings closed, towards ground; female may fly up to meet him. Nest built of grass, in hollow in ground or in grass tuft. Clutch 3-7 eggs, usually 4-5; incubation by female alone, period 13 days; fledging period 10-11 days. Nest success often poor, as low as 24% in study in S Saskatchewan (Canada); parasitized by Brown-headed Cowbird (*Molothrus ater*).
Movements. Migratory. Leaves breeding grounds from late Sept, flying mostly through C USA; spends non-breeding season in S USA (S from S Arizona, Texas, S Louisiana and NW Mississippi) and N & C Mexico (mainly Mexican Plateau and Gulf-Caribbean slope); returns N in late Mar and through Apr, arrival on breeding grounds in May in N. Vagrants recorded in most US states.
Status and Conservation. VULNERABLE. Population has declined rapidly. Probably fairly common in some parts of range but uncommon to rare in others; in USA, breeds only irregularly in South Dakota and rare in NW Minnesota; in Canada, occasional breeding recorded outside main range, in S British Columbia, possibly also in W Ontario. Current population estimates vary; certainly more than 10,000 adults, but some estimates give far higher figure. Since 1900, c. 75% of Canadian prairies thought to have been lost to agricultural changes, and significant declines in this species' numbers probably occurred in late 19th and early 20th centuries. Since 1970, rapid population reduction of 4-7% annually; rates of decline have decreased in USA but increased in Canada (equivalent of 53% decline in 10 years since 1975). Although most of the prairie habitat is unprotected, large areas are in military reserves, national parks and on Prairie Farm Rehabilitation lands. Threats include loss of and degradation of both breeding and non-breeding habitats, mainly through conversion of prairies to seeded pasture, hayfields and cropland, and intensive grazing; overgrazing, burning and hay-cutting adversely affect habitats and cause nest losses. Impacts of grazing and burning, however, variable; in particular, burning is considered a preferred management technique as it reduces the number of woody plants, and, although having a negative impact in the first year, it has positive effects in subsequent years. Introduction of alien plant species also has negative effect on breeding densities of this species. In addition, this is one of the North American grassland species considered most vulnerable to global warming; models project that it could potentially be extirpated from most of its current range in the USA and S Canada.
Bibliography. Alström & Mild (2003), Anon. (1998a, 1999a), Arendt (1992), Arnold (1984), Baicich & Harrison (1997), Bent (1950), Bridges & Leatherman (1991), Campbell *et al.* (1997), Cassidy (1990), Dale *et al.* (1997), Davis (2003), Davis *et al.* (1999), Dechant *et al.* (1998), DeGraaf & Rappole (1995), Eckert (1999), Finch (1991), Fritcher (1997), Hellmayr (1935), Howell & Webb (1995a), Johnsgard (1979), Kale *et al.* (1969), Kaufman (1996), Kutac (1989), Lambeth & Lambeth (1988), Madden, Hausen & Murphy (1999), Madden, Murphy *et al.* (2000), McNair (1998), McNicholl (1988), Prescott (1997), Prescott & Davis (1998), Price *et al.* (1995), Rappole *et al.* (1995), Ridgway (1904), Robbins (1998), Robbins & Dale (1999), Root (1988), Small (1994), Stattersfield & Capper (2000), Stotz *et al.* (1996), Sutter (1997), Sutter *et al.* (1996), Terres (1982).

24. Short-billed Pipit

Anthus furcatus

French: Pipit à plastron **German**: Weißbauchpieper **Spanish**: Bisbita Piquicorto

Taxonomy. *Anthus furcatus* d'Orbigny and Lafresnaye, 1837, Carmen, Río Negro, Patagonia, Argentina.
Molecular-genetic analyses suggest possible close relationship with *A. spragueii*, *A. hellmayri* and *A. bogotensis*. May form a clade with those and with *A. lutescens*, *A. correndera*, *A. antarcticus*. Two subspecies recognized.
Subspecies and Distribution.
A. f. brevirostris Taczanowski, 1875 - C Peru S to W Bolivia and NW Argentina (Jujuy).
A. f. furcatus d'Orbigny & Lafresnaye, 1837 - lowlands of Argentina (Tucumán S to N Chubut) E to extreme SE Brazil and Uruguay.



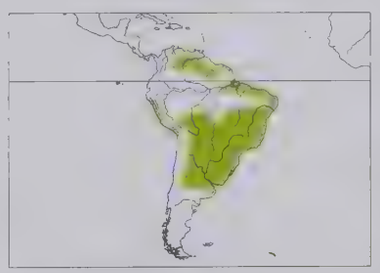
Descriptive notes. 14-14·5 cm; 20 g. Smallish, streaked pipit with relatively short, deep-based bill. Has whitish eyering and supercilium, prominent black malar stripe; above, streaked and mottled blackish-brown and buffy brown, appearing scaled; wings dusky, primaries narrowly edged white, secondaries, tertials and wing-coverts edged buffy (two pale wingbars); tail dusky, outer two feather pairs white or whitish; whitish below, breast and flanks strongly tinged ochraceous, upper breast with well-marked area of blackish streaking (more greyish and less boldly streaked below when plumage worn); underwing-coverts white; iris brown; bill dark; legs pale pinkish-buff, somewhat curved hind claw of medium length (10 mm). Sexes alike. Juvenile resembles adult, but has broad creamy edgings on upperparts. Race *brevirostris* generally buffier, less greyish, with longer, bolder streaks on flanks (often concealed by wings). Voice. Song, uttered incessantly in flight, is musical and repetitive, "gleeeeeeeu-teedeleh-tleetleetlee" or variation.
Habitat. Short grass by lakes, in pastures, and on rolling hills with mix of bunch-grass and short grass in *puna* zone, to 4300 m; generally in more arid country than other Andean pipits. At lower altitudes, occurs on temperate grassland.
Food and Feeding. Small insects and other invertebrates, probably also seeds; no details available. Forages while walking on the ground, as other pipits; picks food items from surface. Associates with *A. correndera*; unlike that species, does not wag tail. Occurs singly or in pairs in breeding season; in flocks at other times.
Breeding. Few data. Male in nuptial flight hovers at 60-80 m in air for 10-30 minutes or more, diving during each song bout, rarely alighting on trees. Cup-nest of grasses, in depression on ground. Clutch up to 4 eggs. No other information available.
Movements. Poorly known. May undertake some local movements, as it forms flocks outside breeding season; possibly altitudinal movements in Andes (race *brevirostris*). Some longer-distance movements occur, as individuals appear in Paraguay during non-breeding season.
Status and Conservation. Not globally threatened. Status uncertain; described variously as fairly common and as uncommon to locally common. In Argentina, reportedly most numerous in Patagonian steppes of Río Negro; much less numerous than *A. correndera* in *pampas* of Buenos Aires. No particular threats identified.
Bibliography. Andors & Vuilleumier (1995), Bond (1956a), Canevari *et al.* (1991), Chebez *et al.* (1999), Couve & Vidal-Ojeda (2003), Fjeldså & Krabbe (1990), Hayes (1995), Hayes *et al.* (1994), Hellmayr (1935), Hennessey, Herzog & Sagot (2003), Isacch & Martínez (2001), Johnson (1967), Klimaitis & Moschione (1987), Meyer de Schauensee (1982), Mouchard (1998), Narosky & Di Giacomo (1993), Ridgely & Tudor (1989), Rocha & Peñaranda (1995), Roe & Rees (1979), Salvador (1988), Sick (1993), Stotz *et al.* (1996), Vickery *et al.* (2003), Vuilleumier (1985), Zimmer (1930, 1953).

25. Yellowish Pipit

Anthus lutescens

French: Pipit jaunâtre **German**: Savannenpieper **Spanish**: Bisbita Amarillento

Taxonomy. *Anthus lutescens* Pucheran, 1855, vicinity of Rio de Janeiro, Brazil.
Relationships uncertain; may form a clade with *A. spragueii*, *A. furcatus*, *A. correndera*, *A. antarcticus*, *A. hellmayri* and *A. bogotensis*. Form "*A. chii*" might be referable to present species, but best considered unidentifiable. Three subspecies recognized.
Subspecies and Distribution.
A. l. parvus Lawrence, 1865 - Pacific slope in W Panama.
A. l. lutescens Pucheran, 1855 - NE Colombia, Venezuela (except N & S), the Guianas, and lowlands from E Bolivia and N, C & E Brazil S to Argentina (S to La Pampa and SE Buenos Aires) and Uruguay.
A. l. peruvianus Nicholson, 1878 - coastal Peru (S from Trujillo) S to extreme N Chile (Arica).



Descriptive notes. 13 cm; 13-18 g. Very small, rather slender pipit with yellowish underparts, relatively short tail. Nominate race has narrow white eyering, very indistinct pale supercilium; dark brown above, buff-brown feather edging giving streaked appearance, speckling on side of neck; remiges blackish-brown, edged buff, pale tips of wing-coverts (two pale wingbars); tail blackish-brown, T5 white apart from dark inner edge of inner web, T6 has white or pale brown outer web and white inner web; buffy to yellowish-white below, dark brown streaks across breast (forming band) and on upper flanks; iris dark; bill dark; legs pale. Distinguished from almost all other pipits by small size and yellowish underparts; from *A. nattereri* by smaller size, less golden tone below. Sexes alike. Juvenile undescribed. Race *peruvianus* is slightly larger than nominate, paler above, feather edgings greyish, wing-covert tips more whitish and less buffy, whiter and less buffy yellow below; *parvus* is small, has feather edgings above more cinnamon-

On following pages: 26. Chaco Pipit (*Anthus chacoensis*); 27. Correndera Pipit (*Anthus correndera*); 28. South Georgia Pipit (*Anthus antarcticus*); 29. Ochre-breasted Pipit (*Anthus nattereri*); 30. Hellmayr's Pipit (*Anthus hellmayri*); 31. Paramo Pipit (*Anthus bogotensis*).

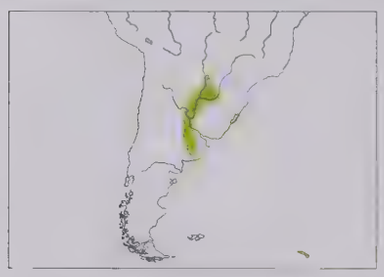
buff, is more yellowish with less extensive streaking below. Voice. Song, usually in flight, a series of "tsit" notes during ascent followed by long slurred "dzeeeeeeeeeeeu" during slow gliding descent, has been likened to sizzle sound of fireworks being set off. Call a short "tsitsirrit", also "wisst".
Habitat. Grassland and adjoining bare areas. Found in variety of open habitats, from tropical damp, often seasonally wet, short grassland to pastures and agricultural land, often near rivers, lakes and marshes; seems to prefer very short grass. Lowlands, to c. 1300 m; in Venezuela, below 200 m N of R Orinoco.
Food and Feeding. Small insects, probably also seeds; no detailed information. Forages by walking and running in short grass; when disturbed, often flies up high and moves far away.
Breeding. Season Jan-Jun, also Sept, in Panama; recorded in May-Jun and Sept-Oct in Venezuela. Monogamous; territorial, but often loosely colonial, with 15-20 birds in close proximity. In display-flight, male rises 10-20 m in air, rarely to 50 m, makes series of steep climbs and descents, then glides slowly in straight line down to ground. Nest described as oven-like, constructed of grasses and other soft vegetation, on ground in short grass. Clutch 2-4 eggs. No further information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Widespread, and locally fairly common to common in much of range. Not considered likely to be at any risk.
Bibliography. dos Anjos *et al.* (1997), Anon. (1998a), Araya & Chester (1993), Brace *et al.* (1997), Canevari *et al.* (1991), Chebez *et al.* (1999), Delgado (1985), Eisenmann (1955), Fraga & Clark (1999), Friedmann & Smith (1950), Haverschmidt & Mees (1994), Hayes (1995), Hellmayr (1932, 1935), Hilty (2003), Hilty & Brown (1986), Jaramillo (2003), Johnson (1967), Narosky & Di Giacomo (1993), Parker & Goerck (1997), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), do Rosário (1996), Schubart *et al.* (1965), Sick (1993), da Silva *et al.* (1997), Silveira (1998), Stotz *et al.* (1996), Straneck (1987), Tostain (1980), Tostain *et al.* (1992), Vickery *et al.* (2003), Wetmore *et al.* (1984), Zimmer (1953).

26. Chaco Pipit

Anthus chacoensis

French: Pipit du chaco **German**: Chacopieper **Spanish**: Bisbita Chaqueño

Taxonomy. *Anthus chii chacoensis* J. T. Zimmer, 1952, Avia Terai, Chaco, Argentina.
Relationships unclear; appears to be close to *A. lutescens*. Monotypic.
Distribution. Lowlands from Paraguay (S from Concepción) S to EC Argentina (S to SC Buenos Aires).



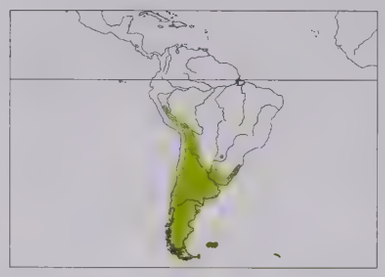
Descriptive notes. 13 cm. Very small, streaked pipit. Has pale areas around eye, short dark moustachial streak, faint thin dark malar stripe; dark brown above, greyish edges of feathers giving streaked appearance; wings blackish-brown, edged pale buffish; tail dark brown, outer rectrix mostly white; white below, dark spots on breast, dark streaks on flanks; iris dark; bill dark, pinkish base of lower mandible; legs pinkish. Distinguished from closely similar *A. lutescens* by streaks above being whiter, less buffy, no trace of yellow on underparts, more pronounced streaks on flanks; in the hand, also shorter hind claw, less white on tail. Sexes alike. Juvenile undescribed. Voice. Song, in flight, long protracted series of more than 50 syllables, e.g. "clicliclicliclidlidli... dlewdlew... dleeddleed... leecleeclee... cliclicli".
Habitat. Lowland grassland, including pastures. Prefers open areas with grass no taller than 50 cm.
Food and Feeding. Diet unknown. Forages on the ground, in typical pipit fashion.
Breeding. In song flight, male rises to 60-80 m, lower when winds strong, occasionally drops short distance before rising again; display can last for over 1 hour. No other information.
Movements. Partial migrant; S population migrates N to SE Paraguay and N Argentina.
Status and Conservation. Not globally threatened. Fairly common. Formerly regarded as a high conservation priority and high research priority, as it was so poorly known and apparently had a restricted distribution; there were concerns about a possible decline. Recent work in Argentina, however, suggests that it is more widespread than was previously thought and that it has probably been overlooked. Research needed on its ecology and breeding behaviour.
Bibliography. Canevari *et al.* (1991), Chebez (1994), Chebez *et al.* (1999), Collar & Andrew (1988), Collar *et al.* (1994), Fjeldså & Krabbe (1990), Hayes (1995), Isacch *et al.* (2003), Lowen *et al.* (1996), Narosky & Di Giacomo (1993), Narosky & Yzurieta (1993), Nellar (1993), de la Peña (1997), Ridgely & Tudor (1989), Short (1975, 1976), Stotz *et al.* (1996), Straneck (1987), Vickery *et al.* (2003).

27. Correndera Pipit

Anthus correndera

French: Pipit correndera **German**: Correnderapieper **Spanish**: Bisbita Correndera

Taxonomy. *Anthus correndera* Vieillot, 1818, Paraguay. Probably closest to *A. antarcticus*; the two may be part of a clade that also contains *A. spragueii*, *A. furcatus*, *A. lutescens*, *A. hellmayri* and *A. bogotensis*. Recent DNA work suggests that nominate race and *catamarcae* may represent a separate species, or indeed two separate species. Races appear to intergrade. Proposed race *phillipsi* (Port Stanley, in Falkland Is) synonymized with *grayi*. Five subspecies tentatively recognized.
Subspecies and Distribution.
A. c. calcaratus Taczanowski, 1875 - mountains of Peru.
A. c. catamarcae Hellmayr, 1921 - N Chile (E Antofagasta), SW Bolivia and NW Argentina (Catamarca).
A. c. correndera Vieillot, 1818 - S Paraguay, N Argentina, Uruguay and extreme SE Brazil (Rio Grande do Sul).
A. c. chilensis (Lesson, 1839) - Chile (S from Atacama) and S Argentina S to Tierra del Fuego.
A. c. grayi Bonaparte, 1850 - Falkland Is.
Descriptive notes. 14-16 cm; 15-26·5 g (*grayi*), two males 20·2 g and 20·3 g (*correndera*). Small, well-marked pipit with long bill and flat head. Nominate race has whitish supercilium and eyering, narrow blackish moustachial and malar stripes; upperparts dusky, heavily streaked cinnamon-buff, two longitudinal white stripes on each side of mantle; wings dusky, primaries edged white, wing-coverts edged buffy white (two wingbars); tail dusky, outer two feather pairs mostly white to whitish; buffy white to whitish below, bold black spots across breast and prominent streaking on flanks; iris dark; bill dark, paler base of lower mandible; legs brown to pinkish-brown, hind claw almost straight. Sexes alike. Juvenile has supercilium tinged yellow, feathers of upperparts edged whitish, primaries edged yellow, wingbars white, buffer below. Races differ in amount of white in tail, and colour of upperparts and underparts (extent of cinnamon): *chilensis* is darker and more buffy than nominate, mantle streaks pale buff, rump tinged rufous, has less dense streaking on breast but streaks extend to upper belly, less white in tail (confined to outermost feather and shaft of adjacent feather); *catamarcae* is darker above with more rufous on rump than previous, and has wing, bill and tarsus longer; *calcaratus* is much darker than nominate, upperparts tinged cinnamon, rump rufous, buff below; *grayi* is larger than nominate, with stronger bill, smaller markings on breast. Voice. Song, in flight or sometimes from perch, a repetition of simple phrases, e.g. "glishaw-gleeeer, glishaw-cleeeer, glishaw-gleeeer", with last note drawled, or "tzi ti tie tzi ti trrrr", with final trill prolonged (during glide); also, from perch, short varied phrases repeated up to five times. Flight call a harsh "trrrit", "srit" or "tsrrr".



Habitat. In N (nominate race and *calcaratus*), *puna* grassland on arid plateaux, also pastures and agricultural land, and in wetter situations such as bogs and lakeshores with short grass and scattered clumps of rushes; 2500-4450 m. Elsewhere, found in grassland, wetland edges and Patagonian steppe, from sea-level to c. 1250 m; prefers large areas of coarse white grass in wet areas in Falklands (*grayi*). Occurs frequently on grassy roadsides. Where it overlaps with *A. furcatus*, uses lusher areas with taller grass than those preferred by latter.
Food and Feeding. Poorly known. Adult and larval insects and other invertebrates, probably also seeds. Chicks fed with small worms and lepidopterans in Falklands (*grayi*). Forages on ground, walking and running in typical pipit fashion.
Breeding. Jun-Dec; possibly throughout year in C Peru (Junín); late Sept to Dec in Falklands; often two broods. In song flight, male rises quickly to 20-40 m, then hovers while singing, often glides downwards and rises again several times. Nest a grass cup, lined with finer material and hair, well concealed in a depression on ground. Clutch 2-4 eggs; incubation and fledging periods apparently not documented.
Movements. Resident and partial migrant. Some in C & S parts of range (*chilensis*) remain in breeding area throughout year, although many move N after breeding; those in extreme S migrate N in Apr and return in Sept; nominate race also recorded as non-breeding visitor in SE Brazil (N to São Paulo).
Status and Conservation. Not globally threatened. Common to fairly common and widespread throughout range; very numerous on the *pampas* of Buenos Aires (E Argentina). Common in Falkland Is (race *grayi*), estimated 8000-15,000 pairs in 1983-1993. Not likely to be at any risk in the foreseeable future in most of range. Introduced cats and rats (*Rattus*) represent a threat in Falklands, where grass-burning also a problem.
Bibliography. dos Anjos *et al.* (1997), Araya & Chester (1993), Barrows (1883), Bond (1956a), Bornschein *et al.* (1997), Canevari *et al.* (1991), Chebez (1994), Chebez *et al.* (1999), Couve & Vidal-Ojeda (2003), Fjeldså & Krabbe (1990), Hall *et al.* (2002), Harris (1998), Hayes (1995), Hayes *et al.* (1994), Hellmayr (1932, 1935), Humphrey *et al.* (1970), Isacch & Martínez (2001), Isacch *et al.* (2003), Jaramillo (2003), Johnson (1967), Klimaitis & Moschione (1987), Landbeck (1877), Narosky & Di Giacomo (1993), Navas & Bó (2000), Parmelee & Rasmussen (1994), Ridgely & Tudor (1989), Roe & Rees (1979), do Rosário (1996), Shirihai (2003), Sick (1993), Stotz *et al.* (1996), Voelker (1999a, 1999b), Vuilleumier (1985), Woods (1988), Woods & Woods (1997), Zimmer (1953).

28. South Georgia Pipit

Anthus antarcticus

French: Pipit antarctique **German**: Riesenpieper **Spanish**: Bisbita de Georgia del Sur
Other common names: Subantarctic Pipit

Taxonomy. *Anthus antarcticus* Cabanis, 1884, South Georgia.
May be closely related to, and possibly have evolved from, *A. correndera*; the two may belong to a clade that also includes *A. spragueii*, *A. furcatus*, *A. lutescens*, *A. hellmayri* and *A. bogotensis*. Monotypic.
Distribution. South Georgia (mainland and offshore islets), in S Atlantic Ocean.



Descriptive notes. 16·5 cm. Has indistinct buffish supercilium and area around eye, more prominent blackish moustachial and malar stripes; dark brown above, rufous or fawn-white feather edges giving heavily streaked appearance, indistinct pale lines on mantle side; wing feathers edged pale, wing-coverts with pale tips (indistinct wingbar on median coverts); tail blackish-brown, outer rectrix mostly greyish-white; throat whitish, underparts whitish, breast, belly and flanks usually washed buff, with heavy brown streaks, belly centre less streaked; iris dark brown; bill blackish, reddish base; legs greyish to flesh-brown, hind claw rather long. Sexes alike. Juvenile is generally more buff than adult, especially below. Voice. Song, in flight, soft twittering phrases and high-pitched series, up to several minutes in duration, described as resembling song of a *Motacilla* or of Song Sparrow (*Melospiza melodia*) but longer, and softer in tone than latter's; also a shorter song, with longer intervals, from ground. Quiet soft notes or sharper "tzip" when flushed.
Habitat. Tussac (*Poa flabellata*) grassland, especially by streams and inland pools, and rocky shores; at and near sea-level. Mainly along ice-free shorelines during austral winter.
Food and Feeding. Small arthropods, such as adult and nymphal springtails (Collembola), beetles (Coleoptera), flies (Diptera) and spiders (Araneae). Springtails trapped in small freshwater pools by surface tension a favoured food in spring; feeds extensively on marine invertebrates along shoreline and around tidal pools, especially when grass areas snow-covered during winter. Uses thick grass as cover when foraging; walks or runs a short distance, stops, flicks tail, runs again. Picks food items from grass or from algae.
Breeding. Breeds mid Nov-Jan/Feb; frequently double-brooded. Male performs display-flight. Nest a deep, bulky cup of fine roots and dry grass, lined with feathers, partly domed, built ground within grass tussock; also reported as placed in rock crevice on mainland. Clutch usually 3-4 eggs, sometimes 5; incubation and fledging periods not documented. Winter survival of juveniles low. Occasionally preyed on by Brown Skua (*Catharacta antarctica*) of race *lonnbergi*.
Movements. Resident; most move to offshore islets to breed.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Not uncommon; current population estimated at 3000-4000 pairs. Has been largely exterminated from the mainland by brown rats (*Rattus norvegicus*), and breeds only in a few areas enclosed by sea-level glaciers on S side of island, where rats absent; breeding pairs now largely confined to c. 20 rat-free offshore islets, e.g. 150-200 pairs on Bird I, and numerous on Prion I (e.g. 6 pairs in c. 0·5 km on a tussocky hillside). Rapid increase in numbers of Antarctic fur seals (*Arctocephalus gazella*) at South Georgia (where 95% of world population now breeds) has resulted in destruction of more

than 60% of the tussac grass habitat in certain areas (mainly Bird I and NW extremity of main island), as females and pups wander inland to rest in summer; grasses along streambanks and in meadows also squashed by fur seals moving between coast and inland haul-out areas. Although destruction of vegetation may have had some detrimental effects on this pipit, which depends on tussac grass for nesting sites, one researcher noted no change in the species' numbers on Bird I during nine years in 1990s; he suggested that damage to grass might have caused redistribution of the species, rather than any reduction in its numbers. Brown rats, combined with recession of glaciers (allowing further spread by this predator), believed to pose main threats.

Bibliography. Atkinson (1985), Canevari *et al.* (1991), Chebez (1994), Chebez *et al.* (1999), Croxall (1987), Headland (1984), Hellmayr (1935), Jaramillo (2003), McIntosh & Walton (2000), Prince & Croxall (1983), Prince & Poncet (1996), Pye & Bonner (1980), Reeves *et al.* (1992), Ridgely & Tudor (1989), Shirihai (2003), Stattersfield & Capper (2000).

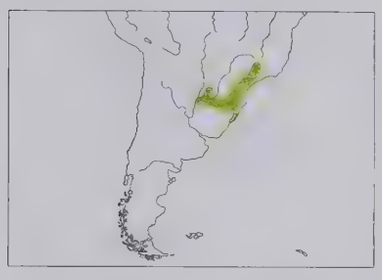
29. Ochre-breasted Pipit

Anthus nattereri

French: Pipit ocré **German**: Ockerbrustpieper **Spanish**: Bisbita Ocre

Taxonomy. *Anthus nattereri* P. L. Sclater, 1878, Rio Verde, São Paulo, Brazil. Monotypic.

Distribution. S Paraguay, NE Argentina (Corrientes) and SE Brazil (Minas Gerais S to Rio Grande do Sul).



Descriptive notes. 13·5-15 cm. Rather small pipit with distinctive plumage. Has yellow-buff supercilium streaked black, black spot on cheek, thin dark moustachial stripe; blackish-brown above, including wings, with bright buff or golden ochraceous-yellow feather edgings giving boldly streaked blackish appearance; rump less streaked, and more rufous or golden-buff; tail dark brown, feathers pointed, T4 paler and tipped white, T6 pale brownish-white with dark brown wedge on proximal part of inner web, T5 similar but has more dark brown; throat creamy; breast golden-buff to orange, streaked brown, flanks rufous-buff, streaked brown, belly buffy white; iris dark; bill brown, basal two-thirds of lower mandible pale; legs yellow-brown or reddish-brown, long hind claw. Sexes alike. Juvenile not described. Voice. Song, in flight, complex and musical series of notes ending in slurred "eeeeeeeur", followed by several nasal notes on alighting on ground.

Habitat. Dry pastures and fields and rolling *campo* grassland, to 900 m. Has been recorded in breeding season in young eucalypt (*Eucalyptus*) plantation. Appears to show some preference for burnt areas with regenerating short grass (Brazil) or lightly grazed grassland.

Food and Feeding. Little known. Small invertebrates; one stomach contained only insects. Forages on the ground, picking food items.

Breeding. Nest with eggs in Oct; gonadal condition of specimens and recorded song period suggest breeding probably in Sept-Jan. In aerial display, male rises to c. 25 m, hovers while singing, descends rapidly in spiral (still singing). Few other data, all from S of range. Nest a shallow cup of plant stems and grass roots, on ground by grass tussock. One clutch documented, of 4 eggs, incubated by female, role of male not known. Nest parasitism by Shiny Cowbird (*Molothrus bonariensis*) recorded.

Movements. Not well known; studies in SE Brazil (São Paulo) suggest that it is semi-nomadic in response to optimal conditions.

Status and Conservation. VULNERABLE. Scarce and very local. Formerly considered Endangered, but recently found to be more widespread and somewhat less rare than was thought. In Paraguay, surveys in late 1990s revealed the species' presence at 14 sites, with important populations in Misiones and Caazapá and at two sites in Itapúa. In Argentina, was found in Corrientes in 1960s and rediscovered at same locality (now named San Juan Bautista) in Jan 1993. Previously widespread and not uncommon in Brazil, but has declined greatly; recent observations from at least three sites in Minas Gerais, including Serra da Canastra National Park, and one in São Paulo, and a possible observation farther S, in Santa Catarina. The dry natural grasslands that it requires are threatened by agricultural and forestry development; conversion to crops such as sugar cane and soybeans in Brazil, and the planting of alien trees such as eucalypts on grasslands in all three countries in which it occurs, are of major concern, as are the conversion of grassland to reseeded pasture and the use of pesticides. Intensive grazing, over-frequent burning and invasive grasses are additional threats. A critical factor, at least locally, seems to be the species' need for a mosaic of burnt grassland areas; although it initially disappears after fires, it is one of first species to reappear when grass has regenerated, but it cannot tolerate annual burning of habitat. Flooding resulting from the Yacyretá Dam, in Paraguay, is a further problem, and parasitism by Shiny Cowbird may add to the pressures faced by this pipit.

Bibliography. dos Anjos *et al.* (1997), Anon. (1999b), Belton (1985), Canevari *et al.* (1991), Cavalcanti (1999), Chebez (1994), Chebez *et al.* (1999), Clay, Capper *et al.* (1998), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Coutinho (1982), Cracraft (1985), Di Giacomo & Krapovickas (2001), Hayes (1995), Hellmayr (1935), Lowen *et al.* (1996), Meyer de Schauensee (1982), Parker & Willis (1997), Pearman & Abadie (1995), Ridgely & Tudor (1989), do Rosário (1996), Sick (1985, 1993), Silveira (1998), Stattersfield & Capper (2000), Stotz *et al.* (1996), Wege & Long (1995), Willis (1991a), Willis & Oniki (1988c).

30. Hellmayr's Pipit

Anthus hellmayri

French: Pipit de Hellmayr **German**: Hellmayrpieper **Spanish**: Bisbita Pálido

Taxonomy. *Anthus hellmayri* Hartert, 1909, Río Salí, Tucumán, Argentina.

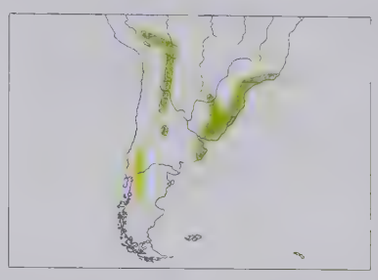
Molecular-genetic analyses suggest possible close relationship with *A. spragueii*, *A. furcatus* and *A. bogotensis*; all may belong to a clade that also includes *A. lutescens*, *A. correndera* and *A. antarcticus*. DNA studies also suggest that nominate race and *brasilianus*, geographically isolated from each other and differing significantly in size, plumage colour and pattern, and voice, may represent two separate species. Race *dabbenei* possibly inseparable from nominate, but also geographically remote. Three subspecies recognized.

Subspecies and Distribution.

A. h. hellmayri Hartert, 1909 - E Andean slopes from SE Peru (Puno) S to NW Argentina (S to Tucumán, also in Sierras de Córdoba).

A. h. dabbenei Hellmayr, 1921 - highlands of S Argentina in Neuquén and W Chubut, also SE Río Negro (Somuncurá Plateau); probably also adjacent S Chile.

A. h. brasilianus Hellmayr, 1921 - SE Brazil (S from Espírito Santo), SE Paraguay, NE & E Argentina (Corrientes, E Buenos Aires) and Uruguay.



Descriptive notes. 14-14·8 cm. Rather small pipit. Nominate race has dusky-streaked whitish supercilium and eyering, small blackish moustachial stripe; pale buff upperparts boldly streaked blackish-brown; wings dusky, primaries and tertials edged whitish, secondaries edged buff (forming patch), wing-coverts edged buff (two wingbars); tail dusky, T5 with small white tip in fresh plumage, T6 mostly buffy white; throat white; underparts buffy white, streaked dusky on breast and flanks; underwing-coverts buffy white; iris dark; bill blackish, paler lower mandible; legs pinkish-flesh. Differs from *A. furcatus* in having streaks on back bolder, breast streaks narrower, streaking on flanks, no prominent malar stripe; from *A. bogotensis* in less buff upperparts with paler streaks, much paler underparts with more extensive and darker streaks. Sexes alike. Juvenile has whitish feather edgings above, is more buff below. Race *dabbenei* is very like nominate, but always has white spot on penultimate tail feather (even when plumage worn); *brasilianus* has edges of all wing feathers tinged cinnamon, underparts also tinged cinnamon. Voice. Song, from perch (fence post, rock) or in air, varied, "zilid zilid zidel-zi, zi arr" or "tu-tee-deée-tu", notes repeated at intervals of 5 seconds. Call "sclip", "tlit", "tjip" or "srip".

Habitat. Grassland; often moist open grassland in *puna* zone in W, to 3600 m (race *dabbenei*) or 3700 m (nominate); in E, dry rocky hillsides and other grassland areas, as well as pastures and agricultural land, to 750 m, locally to 2200 m (*brasilianus*).

Food and Feeding. Data on food preferences lacking. Forages in grassland in manner of other pipits, picking insects from the ground or from short vegetation.

Breeding. Breeds Nov-Jan in Bolivia. Short display-flight, male climbs almost vertically while singing, makes spiralling descent in wide circles with wings held high. No other information.

Movements. S race *dabbenei* migrates N in austral winter. Resident elsewhere.

Status and Conservation. Not globally threatened. Locally uncommon to frequent as a breeding species. Status in Argentina poorly understood; seems to be fairly common in Tucumán, but situation elsewhere uncertain; further study needed. Only three confirmed records in Chile, all in La Araucania; believed to be probably a regular but uncommon breeder there, but clarification required.

Bibliography. dos Anjos *et al.* (1997), Araya & Chester (1993), Bond (1956a), Camperi & Darrieu (1995), Canevari *et al.* (1991), Casañas (1997), Chebez *et al.* (1999), Ferreira de Vasconcelos (2003), Fjeldså & Krabbe (1990), Hellmayr (1932, 1935), Jaramillo (2003), Johnson (1967), Lowen *et al.* (1997), Marín (2004), Narosky & Di Giacomo (1993), Navas & Bó (2000), Nores (1986), Parker & Goerck (1997), Ridgely & Tudor (1989), do Rosário (1996), Salvador (1988), Sick (1993), Silveira (1998), Stotz *et al.* (1996), Voelker (1999a, 1999b), Vuilleumier (1985), Zimmer (1953).

31. Paramo Pipit

Anthus bogotensis

French: Pipit du paramo **German**: Paramopieper **Spanish**: Bisbita Andino

Taxonomy. *Anthus bogotensis* P. L. Sclater, 1855, Santa Fe de Bogotá, Colombia.

Molecular-genetic analyses suggest possible close relationship with *A. spragueii*, *A. furcatus* and *A. hellmayri*; all may belong to a clade that also includes *A. lutescens*, *A. correndera* and *A. antarcticus*. Four subspecies recognized.

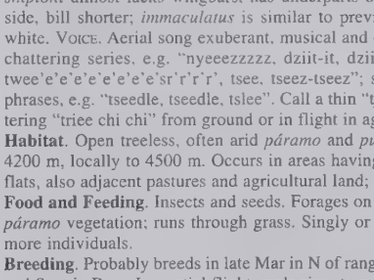
Subspecies and Distribution.

A. b. meridae J. T. Zimmer, 1953 - Andes in NW Venezuela (Trujillo, Mérida, N Táchira).

A. b. bogotensis P. L. Sclater, 1855 - NW Venezuela (Páramo de Tamá, in S Táchira) and Andes from Colombia (N & S parts of C range, also E range S to Cundinamarca) S to N Peru (Cajamarca).

A. b. immaculatus Cory, 1916 - NC Peru S to Bolivia (La Paz, Cochabamba).

A. b. shiptoni (Chubb, 1923) - NW Argentina (Tucumán).



Descriptive notes. 15 cm. Rather slender pipit with relatively long bill. Nominate race has faint blackish-streaked buffy supercilium, narrow whitish eyering; above, dusky to cinnamon-brown, boldly streaked blackish and buff; remiges edged buffy brown, wing-coverts dusky with buff tips (two narrow buffy wingbars); tail dusky, outer rectrix with whitish outer web and buffy inner web, adjacent feather with whitish tip; throat light buff, underparts deep buff (greyer when worn), sparse dark streaks on breast and flanks; underwing-coverts buff; iris brown; bill dusky above, pale below; legs pinkish. Sexes alike. Juvenile not described. Race *meridae* has broader buffy wingbars than nominate, tip of T5 buffy, not white; *shiptoni* almost lacks wingbars, has underparts buffy white to white, sometimes unstreaked on side, bill shorter; *immaculatus* is similar to previous, has crown streaks and supercilium buffy white. Voice. Aerial song exuberant, musical and complex, long wheezing note followed by high chattering series, e.g. "nyeeezzzzz, dziit-it, dziit-it, chit-it-it-it-it-it" or "sweet-sweet-sweez-twee'e'e'e'e'e'e'e'sr'r'r'r', tsee, tseez-tseez"; song from perch thinner, simpler, with broken phrases, e.g. "tseedle, tseedle, tslee". Call a thin "tjirp" or "pit-sit" or "chit chit"; sometimes chattering "triee chi chi" from ground or in flight in aggressive encounters.

Habitat. Open treeless, often arid *páramo* and *puna* grassland in upper montane zone, at 2100-4200 m, locally to 4500 m. Occurs in areas having mix of short grass and bunch-grass, bogs and flats, also adjacent pastures and agricultural land; favours flatter areas.

Food and Feeding. Insects and seeds. Forages on the ground in low shrubs and grass, and in low *páramo* vegetation; runs through grass. Singly or in pairs, occasionally in small parties of six or more individuals.

Breeding. Probably breeds in late Mar in N of range; eggs in Dec and young birds reported in May and Sept in Peru. In nuptial flight, male rises to moderate height and makes slow gliding descent. No further data.

Movements. Apparently resident; some seasonal elevational movements may occur.

Status and Conservation. Not globally threatened. Locally common to fairly common; uncommon to locally fairly common in Ecuador. Can be difficult to locate, and may be overlooked. Possibly occurs more widely in Colombian Andes and more continuously in S of range (Bolivia, Argentina).

Bibliography. Bond (1956a), Canevari *et al.* (1991), Chapman (1921), Chebez (1994), Chebez *et al.* (1999), Fjeldså & Krabbe (1990), Hellmayr (1935), Hennessey, Herzog & Sagot (2003), Hilty (2003), Hilty & Brown (1986), Johnson (1967), Parker *et al.* (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Vuilleumier (1985), Zimmer (1930, 1953).

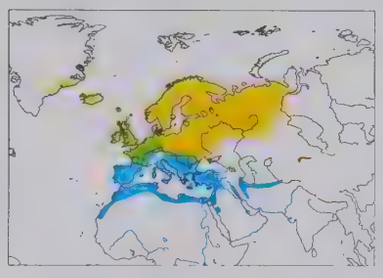

inches 3
cm 8
PLATE 74
32
33
♂
typical
♀
34
♂
"rufogularis"
ssp hodgsoni
ssp trivialis
ssp gustavi
35
ssp yunnanensis
36
ssp haringtoni
37
ssp menzbieri
ssp spinoletta
ssp coutellii
ssp kleinschmidti
38
ssp blakistoni
ssp petrosus
39
ssp littoralis
ssp rubescens
ssp alticola
ssp caffer
42
ssp traylori
40
ssp japonicus
41
ssp australoabyssinicus
43

32. **Meadow Pipit**

Anthus pratensis

French: Pipit farlouse **German**: Wiesenpieper **Spanish**: Bisbita Pratense

Taxonomy. *Alauda pratensis* Linnaeus, 1758, Sweden.
Relationships uncertain; possibly forms a clade with *A. roseatus*, *A. cervinus*, *A. spinoletta*, *A. petrosus* and *A. rubescens*. Validity of race *whistleri* debatable, possibly only a clinal variant. Proposed races *enigmaticus* (described from Tashkent) and *theresae* (W Ireland) included, respectively, in nominate and *whistleri*. Two subspecies tentatively recognized.
Subspecies and Distribution.
A. p. pratensis (Linnaeus, 1758) - breeds SE Greenland, Iceland, and from N, NW & C Europe (except N Scotland and Ireland) E to W Siberia, S to S France and C Romania; has bred Italy (Appennines); isolated population in Caucasus (border mountains of Georgia and Armenia). Winters S to N Africa, Middle East and SW Asia.
A. p. whistleri Clancey, 1942 - N Scotland and Ireland.



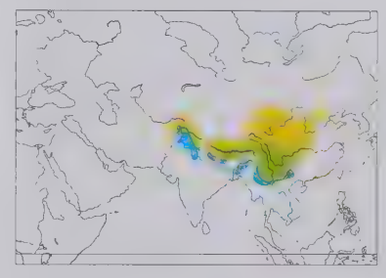
Descriptive notes. 14·5-15 cm; unsexed 14·5-22 g, male mean 18·6 g, female mean 19·5 g. Small streaked pipit with rounded wings and slender bill. Has pale eyering, brown or yellowish-brown ear-coverts, narrow blackish malar stripe; above, earth-brown or greenish olive-brown, with broad brownish-black streaks on top of head, mantle, scapulars and back; wings darker, remiges with narrow greenish or olive edgings, tertials and upperwing-coverts blackish-brown with pale olive or whitish edgings (two wingbars); tail dark brown, central feather pair fringed greenish-olive, T5 with distal white wedge on inner web and white tip of outer web, outermost pair with whitish outer web and large white distal patch on inner web; whitish to greyish or yellowish-buff below (varies according to degree of plumage wear, palest when worn), throat side, breast and flanks broadly streaked blackish-brown; underwing-coverts and axillaries buffy white; iris blackish-brown; bill dark brown, pale brownish-flesh base of lower mandible; legs pale yellowish-brown to flesh-brown, hind claw long. Sexes alike. Juvenile is more buff-brown above with more obvious streaking, more buff or off-white below, flanks virtually unstreaked. Race *whistleri* is more strongly marked than nominate, with heavier streaks on back, has deeper rufescent olive-brown upperparts. Voice. Aerial song a series of several segments, each comprising a number of uniform notes such as "tsip", "tchip", "tyie", "zu", "tu", "tselp", "tlip" and similar, starts quietly and becomes louder and faster, rising in pitch, usually ending with a flourish as "tee-swia-swia"; song from ground simpler, a repetition of "tsip" or "zi" notes. Call a thin, high-pitched squeak, e.g. "psiip", "pheet" or "isst", often repeated 1-3 or more times; louder version when alarmed; also "chutt" or "chitt" as contact call, "sitt-it" when nervous.
Habitat. Breeds in wide variety of open habitats, such as tundra, moorland and heathland, bogs, saltmarshes, dunes, coastal meadows, hillsides, forest clearings, fallow land, occasionally arable land; peatland a preferred habitat in N Europe; mosaic of heather (*Calluna*), bog and grassland probably the optimum habitat in British uplands. Similar habitats in winter, when also found along seashores. Breeds from sea-level to c. 3000 m, in S of range mainly 800-1600 m.
Food and Feeding. Small invertebrates less than 5 mm long; also seeds. Wide range of invertebrates recorded, including, among others, springtails (Collembola), mayflies (Ephemeroptera), dragonflies (Odonata), stoneflies (Plecoptera), grasshoppers (Orthoptera), earwigs (Dermaptera), bugs (Hemiptera), beetles (Coleoptera), alderflies (Neuroptera), scorpion flies (Mecoptera), larval and adult moths (Lepidoptera), flies (Diptera), ants (Hymenoptera), spiders (Araneae), ticks (Acarina), centipedes (Chilopoda), woodlice (Isopoda), amphipods, snails (Mollusca), and lumbricid and polychaete worms (Annelida). In Germany, Norway and Britain, flies and beetles were the dominant items in stomachs, with hymenopteran larva and ants also important in all studies; spiders and harvestmen (Opiliones), moth caterpillars and bugs also significant. In England, adult dipterans formed 70% of food items, a further 19% being insect larvae. In another English study, first-brood chicks fed mainly with craneflies (Tipulidae) (85% by number), as well as mayflies (11%), other adult flies (3%) and their larvae (0·5%), and stoneflies (0·5%); for second broods, later in the season, the number of craneflies dropped to 41%, whereas mayflies increased to 30% and adult flies and moths formed, respectively, 11·5% and 7·4% of nestling diet. Various plant seeds also taken; seeds of grasses (Gramineae), sedges (Cyperaceae) rushes (Juncaceae), heaths (Ericaceae) and crowberries (*Empetrum*) important in autumn and winter. Will also take bread and suet crumbs on occasion. Forages on ground in short vegetation, usually less than 10 cm tall. Walks or runs; picks prey items from ground and vegetation; occasionally reaches up for a flying insect, but rarely pursues aerial insects in flight. Observed to wade in shallow water. Often in small to large flocks on passage and in non-breeding season.
Breeding. Season late Mar-Aug, later at high altitudes; double-brooded in C & W Europe (rarely in N), occasionally three broods. Monogamous; territorial. In song flight, male rises to c. 20 m, then descends with wings half-spread, tail slightly raised. Nest a neat cup of grass, lined with finer grass and hair, concealed in vegetation on ground. Clutch 2-7 eggs, clutch size larger with increasing latitude, mean in W Germany 4·64, in Norway 5·42 in S and 5·75 in N (Finnmark); incubation 13 days, by female alone, occasionally assisted by male; chicks fed by both parents for c. 12·5 days, may leave nest before able to fly; post-fledging care by both parents, for c. 12-14 days.
Movements. In W Europe mainly resident or partial migrant; many undertake local altitudinal movements, descending from hills to lowlands for winter. Populations from Greenland and Iceland migrate to W Europe. N & E populations are medium-distance migrants, although some make only short-distance hard-weather movements; majority migrate to W, C & S Europe, but some winter farther S, in coastal regions of N Africa and in Middle East (S mainly to NW Arabia), and a few reach desert oases and SW Mauritania; W Siberian breeders migrate mostly to SW Asia, from Iraq and Iran E to Uzbekistan. Autumn migration predominantly in Sept-Nov; departure from wintering areas late Feb, main passage N through Europe in Mar-Apr. Vagrants recorded N to Spitsbergen, W to Madeira and Azores, and E to E Kazakhstan, N Pakistan and Oman; also as far from normal range as Japan.
Status and Conservation. Not globally threatened. Generally common to locally very common, especially in N of range; uncommon in some areas. European population c. 12 million breeding pairs, of which c. 90% in Russia, Norway, Finland, Iceland, Britain and Ireland. Densities highest in N, e.g. 80 pairs/km² in Lappland peatlands, compared with 5-20 pairs/km² in S; only 0·1 pair/10 ha on arable land. Population levels fluctuate according to severity of weather in winter quarters and on spring migration; no long-term trends evident. Some range expansions recorded in France, Finland and Czech Republic, but these offset by declines in the Low Countries, Denmark and C Europe; intensification of agriculture believed to be primary reason for the declines. Forest degradation caused by acid rain has created new breeding habitat in some areas.
Bibliography. Adamian & Klem (1999), Alström & Mild (2003), Bahus (1993), Baicich & Harrison (1997), Bannerman (1963), Bannerman & Bannerman (1965), Beaud *et al.* (1992), Borrow & Demey (2001), Bureš (1994a, 1994b), Bureš & Pavel (1997), Bureš, Nádvorník & Saetre (2002), Bureš, Pavel *et al.* (1998), Burkmar (1988), Carrera (2003), Clancey (1961), Constant & Eybert (1980), Coulson (1956a, 1956b), Cramp (1988), Davies (1989), Davies & Brooke (1989a, 1989b), Denkinger (1994), Dougall (1993, 2002a), Dunn (1994), Ebenhöh & Gatter (1991), Elfström (1990, 1992), Étchécopar & Hüe (1964), di Fabrizio *et al.* (1982), Goodman *et al.* (1989), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Halupka (1994, 1998a, 1998b), Handrinos & Akriotis (1997), Heath & Evans (2000), Heath *et al.* (2000), Heinroth & Steinbacher (1952), Helbig *et al.* (1987), Henle (1983), Hirschfeld (1995), Hötker (1982a, 1982b, 1988, 1989), Hötker & Sudfeldt (1978, 1979a, 1979b, 1982), Kalejta (1997), Keith *et al.* (1992), Knystautas (1993), Lorge (1998), Marchant *et al.* (1990), Moksnes & Roskaft (1989), Pavel *et al.* (2000), Pedroli & Graf-Jaccottet (1978), Randler (1997), Ridgway (1904), Ripley (1982), Roberts (1992), Rogacheva (1992), Ryves (1943), Seel & Walton (1974, 1979), Snow & Perrins (1998), Spaepen (1988, 1989), Stepanyan (1990), Tellería *et al.* (1999), Vanhinsbergh (2000), Vanhinsbergh & Chamberlain (2001), Vaurie (1954a), Walton (1979, 1984), Zink (1973-1985).

33. **Rosy Pipit**

Anthus roseatus

French: Pipit rosé **German**: Rosenpieper **Spanish**: Bisbita Rosado
Other common names: Roseate/Rose-breasted/Vinaceous-breasted Pipit

Taxonomy. *Anthus roseatus* Blyth, 1847, Nepal.
Originally named as *A. pelopus*, but that name invalid. Relationships uncertain; possibly forms a clade with *A. pratensis*, *A. cervinus*, *A. spinoletta*, *A. petrosus* and *A. rubescens*. Monotypic.
Distribution. Breeds in mountains from extreme W China (W Xinjiang) S to NE Afghanistan and E in Himalayas to NE India (Arunachal Pradesh), and in S & E China (C Gansu E probably to Nei Mongol and W Hebei, S to S & E Xizang, Yunnan, W Guizhou and W Hubei); probably also in extreme N & NE Myanmar. Winters S to N India (S to Rajasthan and Assam), Bangladesh and N Thailand.



Descriptive notes. 15-16·5 cm; 17-25 g. Distinctive pipit with seasonal differences in plumage. Breeding plumage distinctive: very long, broad buffish-white to pinkish supercilium, dark grey-brown lores and moustachial stripe; crown and upperparts grey-brown, tinged greenish, crown lightly streaked dark, mantle broadly and distinctly streaked dark grey-brown; wing feathers brownish-grey, edged yellowish-green, median and greater wing-coverts tipped pale grey-brown (two wingbars), tertial edges pale grey-buff; tail brownish-black, central four feather pairs edged yellowish-green, next pair with brownish-white tip, outermost with outer web whitish with brownish-grey tinge; throat pale pinkish; breast to upper belly pink, sometimes tinged buffish, breast side rich buff, rest of underparts pale buffish to whitish, breast side (and occasionally centre) and flanks streaked blackish-brown; axillaries lemon-yellow, underwing-coverts grey, fringed greenish-yellow; iris dark brown; bill blackish; legs pale greyish pink. Distinguished from *A. spinoletta* by more prominent supercilium, heavily streaked mantle and flanks, pale legs. In non-breeding plumage, crown more streaked, has dark malar stripe and patch, more prominent wingbars; pale buffish or whitish below (lacking pink tones), heavy blackish-brown streaking on breast and flanks; base of lower mandible greyish-yellow. Sexes alike. Juvenile resembles non-breeding adult, but browner above, supercilium duskier and less distinct, sometimes indistinctly streaked on back and rump. Voice. Aerial song consists of two parts, twittering during ascent into air, followed by long series of pleasant "tsuli tsuli tsuli" notes during descent; more musical and more varied than that of *A. spinoletta*; also twittering song from ground. Call on take-off a thin single or double "tseep", occasionally triple-noted as "tsip tsip tsip", similar to call of *A. pratensis*, less shrill than that of *A. spinoletta*; alarm at nest a mournful squeak.
Habitat. Breeds on alpine meadows and boulder-strewn grassy slopes, especially near patches of melting snow and on marshy or waterlogged ground; mostly to 4200 m, but to 5300 m in Nepal. Winters in foothills and on plains on short grassland, often near water, and in marshy areas and paddyfields, down to 1500 m.
Food and Feeding. Insects, seeds and berries. Forages on the ground; picks food items from ground surface or from low vegetation. Ingests grit.
Breeding. Breeds end May to Aug, rarely Sept; occasionally double-brooded. In display-flight, male rises into air and sings, descends slowly on outstretched wings. Nest a cup of grass, lined with finer grass and some hair, built in depression, apparently made by the bird itself, under rock or tuft of grass. Clutch 3-4 eggs, usually 4; incubation and fledging periods not documented. Nest sometimes parasitized by cuckoos, e.g. Himalayan Cuckoo (*Cuculus saturatus*).
Movements. Post-breeding movement to lower elevations; N populations migratory. Non-breeding visitor to foothills of Himalayas in N parts of Pakistan, India (S to Rajasthan and Assam), S Nepal, Bhutan and Bangladesh; in E, winters in S parts of breeding range and S to plains of Myanmar (except W & S), NW Thailand and NW Tonkin. Autumn passage reported Sept-Nov; return N from Mar, but many do not reach breeding grounds until late May. Vagrant on Hainan I (SE China).
Status and Conservation. Not globally threatened. Common breeding bird in mountains of W China and in Himalayas; fairly common to common in C China. Uncommon non-breeding visitor in Myanmar and Thailand.
Bibliography. Ali & Ripley (1998), Ali *et al.* (1996), Alström & Mild (1997a, 2003), Bangs & Van Tyne (1931), Barua & Sharma (1999), Delacour & Jabouille (1940), Dharmakumarsinhji (1951), Dhinsa & Sandhu (1988), Étchécopar & Hüe (1983b), Grimmett *et al.* (1998), Holmes (1986), Inskipp & Inskipp (1991), Kazmierczak (2000),

On following pages: 34. Red-throated Pipit (*Anthus cervinus*); 35. Olive-backed Pipit (*Anthus hodgsoni*); 36. Tree Pipit (*Anthus trivialis*); 37. Pechora Pipit (*Anthus gustavi*); 38. Water Pipit (*Anthus spinoletta*); 39. Rock Pipit (*Anthus petrosus*); 40. Buff-bellied Pipit (*Anthus rubescens*); 41. Short-tailed Pipit (*Anthus brachyurus*); 42. Bush Pipit (*Anthus caffer*); 43. Sokoke Pipit (*Anthus sokokensis*).

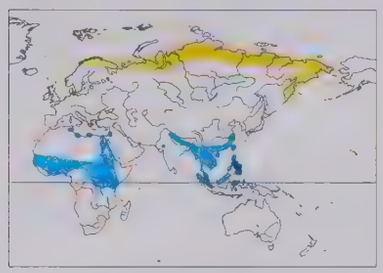
La Touche (1931-1934), Lekagul & Round (1991), Li (1991), Meyer de Schauensee (1984), Pfister (2001), Raja *et al.* (1999), Ripley (1982), Roberts (1992), Robson (2000), Round (1983), Smythies (1986).

34. Red-throated Pipit

Anthus cervinus

French: Pipit à gorge rousse **German**: Rotkehlpieper **Spanish**: Bisbita Gorgirrojo

Taxonomy. *Motacilla cervina* Pallas, 1811, Kolyma, Siberia, north Russia.
Possibly forms a clade with *A. pratensis*, *A. roseatus*, *A. spinoletta*, *A. petrosus* and *A. rubescens*. Birds from W part of Eurasian range (E to Taymyr Peninsula), on average slightly larger and with more contrast in plumage, sometimes recognized as race *rufogularis*; variation, however, apparently clinal. Monotypic.
Distribution. Breeds in N Holarctic, mostly N of Arctic Circle, in narrow band from N Fennoscandia E to NE Russia (Chukotsk Peninsula, S to Kamchatka) and extreme NW USA (W Alaska). Winters predominantly in Africa (mostly S of Sahara) and SE Asia.



Descriptive notes. 14-15 cm; 16·4-29·3 g. Distinctive pipit with seasonal differences in plumage. Male in breeding plumage has deep buffish-pink supercilium, buffish-brown lores and ear-coverts; pale brown upperparts with broad blackish-brown streaking, paler margins of mantle feathers usually forming double "V" or "braces"; primaries and secondaries blackish-brown with narrow buff edgings, tertials and greater and median wing-coverts dark brown with buffish-white tips and edges, lesser coverts dark brown with paler brown edges; tail blackish-brown, central feather pair with buff fringes, T5 with white tip on inner web, T6 with outer web and much of inner web whitish; chin to upper breast deep buffish-pink, upper breast sparsely and narrowly streaked blackish, sometimes more heavily so; rest of underparts buffish-white, lower breast and flanks with bold blackish streaking; underwing-coverts and axillaries greyish-white; iris dark brown; bill dark brown to blackish, base of lower mandible yellowish-flesh; legs yellowish-pink to brownish-flesh. Non-breeding male differs in having supercilium and chin to chest buffish, sometimes tinged pink, whole breast heavily streaked, and blackish malar stripe. Breeding female differs from breeding male in having pink on breast and head less intensive and less extensive, upper breast usually buff and more heavily streaked; non-breeding female resembles male, but lacks pink tinge on supercilium and throat. Immature has buff-white underparts and supercilium, bold black malar stripe, bold black streaking on underparts. Voice. Song, usually in flight, a short series of variable notes followed by several phrases of very thin rattling and buzzing notes, e.g. "chu-chu-chu, swee-swee-swee-swee, psiu psiiu psiiiu siirrrr wi-wi-wi-wi, tswee-tswee-tswee-tswee", some phrases sometimes repeated; simpler version from perch. Calls, often in flight or when flushed, occasionally from ground, include short "tew" and longer, very high-pitched, thin, piercing and slightly descending "teeze", "tseeeaz", "seeeu" or "pseeeeeu", sometimes doubled as "see-seeu" or "teeu teeu".
Habitat. Breeds in willow (*Salix*) mires with many small creeks, sedge (*Carex*) marshes and peat mounds, in tundra. Winters on damp or wet short grassland, often where cattle have trampled muddy bare areas, also on marshes, and at muddy edges of rivers and other wetlands, including paddyfields and coastal flats; in E Africa commonly to 2500 m, occasionally above 3000 m. Often occurs alongside *Motacilla flava* in non-breeding areas.
Food and Feeding. Prey mainly insects, also other invertebrates, and some vegetable matter. Recorded items include mayflies (Ephemeroptera), dragonflies and damselflies (Odonata), grasshoppers and crickets (Orthoptera), cicadas (Cicadidae), alderflies (Neuroptera), larval and adult moths and butterflies (Lepidoptera), ants (Hymenoptera), caddis flies (Trichoptera), flies (Diptera) and beetles (Coleoptera), as well as spiders (Araneae), harvestmen (Opiliones), centipedes (Chilopoda), molluscs, worms (Annelida) and grass seeds (Gramineae). Stomachs from NE Russia (Chukotsk Peninsula) contained mostly ants and sawfly larvae (39·7% of prey items), lepidopteran larvae (26·4%) and beetles (15·7%). In a study in the Yamal Peninsula staphylinid beetles formed 20·5% of items, spiders 15·9% and lepidopteran larvae 12·3%, and scale insects (Coccoidea) were also numerically important; in another Yamal study, 45·4% of items were flies (28·1% chironomids, 10·2% muscids, 7·1% tipulids), with adult lepidopterans and spiders also important. Nestlings at Karigasniemi (NW Finland) were fed mainly with dipterans, hymenopterans (mostly larvae), caterpillars and spiders; diet similar to that of adults. Forages on the ground, often in muddy areas, and among seaweed on seashore; adopts horizontal posture, and walks quickly and wags tail often. Usually in small, loose flocks outside breeding season.
Breeding. Laying early Jun to mid-Jun or Jul in N of range; from end May in S. In song flight, male rises obliquely to c. 20 m, makes parachuting descent; also flutters on horizontal course for up to c. 50 m, before dropping to ground. Nest built by female, initial hollow made by male, both sexes bring material but only male does so in later stages; nest a cup of grass leaves and stems, some moss and dead leaves at base, lined with finer grass, hair and feathers, sited on ground on hummock or bank, sometimes at end of short tunnel. Clutch 2-7 eggs, usually 5-6, mean 5·3, 5·5 and 5·9 in Yamal Peninsula, Finland and Norway, respectively; incubation by female, period 11-14 days; nestlings fed by both parents for 11-15 days. Success variable: fledging success 62·9% at a Finnish study site, 91·8% in the Yamal Peninsula; overall success rate 60·6% in far NE Russia (Chukotsk Peninsula).
Movements. Long-distance migrant. European breeders migrate mainly to sub-Saharan Africa, in a broad band from S Mauritania E to Ethiopia and S to Ivory Coast, N Cameroon, NE DRCongo, N Tanzania; some winter farther N, in Nile Valley and on coasts of N Africa and Red Sea. E populations migrate mainly to SE Asia, SE China and Taiwan, in smaller numbers also to N Indian Subcontinent; rare visitor in N Indonesia and Philippines. Leaves breeding grounds from mid-Aug, passage S through C Europe Sept-Oct, through Middle East mainly Oct-Nov, arrival in Kenya from late Oct; return migration in Kenya and Middle East mainly Mar-Apr, in C Europe during first half May, reaching breeding areas from late May. Timing of migration of E populations similar. Recorded as vagrant in Australia. In North America, migrants regular in autumn along coasts of SW USA (California); vagrant in W Mexico.
Status and Conservation. Not globally threatened. Common to very common; one of the most numerous bird species in arctic tundra. Recent population estimates are 500-20,000 breeding pairs in Norway, 3000 pairs in Finland, 100-1000 pairs in Sweden and 10,000-100,000 pairs in European Russia; global population estimated at 500,000-5,000,000. Little evidence for any changes in status except in Finland, where distribution contracted markedly between 1974-78 and 1986-89 and where the species disappeared from Finnish Lappland; reasons for this unclear.

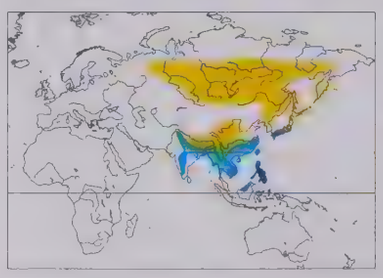
Bibliography. Adamian & Klem (1999), Alström & Krister (1989), Alström & Mild (2003), Anon. (1998a), Archer & Godman (1937-1961), Armstrong (1983), Baicich & Harrison (1997), Bannerman (1953), Bonaccorsi & Rossi (1997), Borrow & Demey (2001), Britton (1991), Carey *et al.* (2001), Catry & Mendes (1998), Coates & Bishop (1997), Cramp (1988), Deignan (1945), Dickinson *et al.* (1991), Dierschke & Dierschke (1991), Duckworth *et al.* (1999), Étchécopar & Hüe (1983b), Ferguson-Lees (1969), Fowler *et al.* (1984), Ginn *et al.* (1989), Goodman *et al.* (1989), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Hellmayr (1935), Howell & Webb (1995a), Jeyarajasingam & Pearson (1999), Kaufman (1996), Keith *et al.* (1992), Kennedy *et al.* (2000), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Mackworth-Praed & Grant (1960, 1973), Medway & Wells (1976), Mlodinow & O'Brien (1996), Natorp (1925), Nikolaus (1987), Olioso (1996), Olsen (1991), Ridgway (1904), Riley (1997), Ripley (1982), Roberts (1992), Robson (2000), Rogers (1981), Sammalisto (1955), Sharrock (1980), Skerrett *et al.* (2001), Small (1994), Smythies (1986, 1999), Snow & Perrins (1998), Stepanyan (1990), Taylor (1979b, 1980), Tree *et al.* (1991), Ward (1963), White & Bruce (1986).

35. Olive-backed Pipit

Anthus hodgsoni

French: Pipit à dos olive **German**: Waldpieper **Spanish**: Bisbita de Hodgson
Other common names: Olive/Oriental Tree Pipit, Spotted Pipit; Hodgson's (Tree) Pipit, Indian Tree Pipit (*hodgsoni*); Siberian Tree Pipit (*yunnanensis*)

Taxonomy. *Anthus trivialis hodgsoni* Richmond, 1907, Bengal, India.
Appears to be very closely related to *A. trivialis*. Races intergrade in N Japan. Proposed race *inopinatus* (Sakhalin) indistinguishable from *yunnanensis*; *berezowskii*, described from Gansu (C China), inseparable from nominate. Two subspecies recognized.
Subspecies and Distribution.
A. h. yunnanensis Uchida & Kuroda, 1916 - breeds from NW Russia (from W of middle R Pechora, SW Siberia and NE Altai) E to Kamchatka, Sakhalin and Kuril Is, S to N Mongolia, NE China (S at least to Liaoning) and N Japan (Hokkaido); winters in S & SE Asia.
A. h. hodgsoni Richmond, 1907 - breeds from Himalayas (E from NW India) E to C China (S Xizang, and from NE Qinghai, S Nei Mongol and Shanxi S to Yunnan and Sichuan), also N Korea and Japan (S to C Honshu); winters in S & SE Asia.



Descriptive notes. 15-17 cm; 17-26·3 g. Nominate race has broad buffish-white to creamy supercilium bordered black above, rear ear-coverts with white spot above a black spot; black malar stripe; upperparts greenish-olive, with prominent black streaks on forehead and crown, and black streaks on mantle; lesser wing-coverts greenish-olive, other wing feathers blackish, edged greenish or yellowish, greater and median coverts with pale tips forming double wingbar (upper one more prominent); tail dull blackish, edged green, T5 with white distal wedge on inner web, cream-buff tip and inner web, T6 white with proximal grey wedge on inner web; chin to upper breast yellow-buff to whitish, lower flanks olive, rest of underparts white to buffy white, breast and upper flanks broadly and heavily streaked or spotted black, lower flanks somewhat less strongly streaked; axillaries and underwing-coverts yellow to buff; iris ochre-brown or dark brown; bill dark horn-brown, base of lower mandible flesh-coloured to reddish-flesh; legs flesh-coloured or pink, sometimes yellowish. Distinguished from *A. trivialis* mainly by having stronger supercilium, narrower mantle streaks, bolder and broader streaks below, different ear-covert pattern. Sexes alike. Immature is browner above than adult, with streaks below longer, wider, but less well defined. Race *yunnanensis* differs from nominate in much less prominent streaks on mantle (often appears plain), somewhat narrower streaks below. Voice. Song, from treetop or in flight, a repetition of single trilled phrases and short dry rattles at fast pace; calls include loud "teaze", hoarse but thin "teez" or "tseep" in flight, and high, thin, almost inaudible "tsi" or "sit" at rest. Most vocalizations very like those of *A. trivialis*.
Habitat. Breeds on edge of taiga, on grassy and bracken-covered slopes, rocky ground and glades in open forest of oak (*Quercus*), birch (*Betula*), alder (*Alnus*), fir (*Abies*) or pine (*Pinus*); also in secondary growth and wooded or abandoned cultivation and scrub with isolated trees, and on barren lava areas, around marshes and shady areas in paddyfields. Also frequents dwarf juniper (*Juniperus*) or other scrub above timber-line, breeding at up to 4000 m in Himalayas. In non-breeding season occurs in Himalayan foothills, to 2500 m; elsewhere, winters in mango groves and other suitable wooded habitats, including coffee and cardamum plantations, on hills and on plains.
Food and Feeding. Insects, including adult and larval moths and butterflies (Lepidoptera), flies (Diptera), beetles (Coleoptera) and bugs (Hemiptera); also grass (Gramineae) and weed seeds. In one study, weevils (of genera *Tanymecus* and *Myllocerus*) formed a large proportion of stomach contents. Forages on ground, usually close to cover; when disturbed, generally flies in to trees, where it often walks along branches. On wintering grounds in Philippines, recorded as feeding frequently in pines, by walking along branches and probing for insects. In small flocks in non-breeding season.
Breeding. Season Jun-Aug in W Siberia (race *yunnanensis*); May to end Jul/Aug in S of range (nominate); normally double-brooded. In song flight, male rises obliquely from tree perch to c. 15-30 m, makes parachuting descent either directly or in arcs. Nest a cup of moss and dry grass, lined with finer grass and a few hairs, placed on ground under tuft of grass or rock, or in shallow depression. Clutch 1-6 eggs, mostly 3-5, usually 4; incubation, probably by female alone, 12-13 days; young fed by both parents, leave nest at 11-12 days, cared for by parents for a further few days.
Movements. N populations migrate to S parts of Asia, wintering from India E to SE China and S to N Malay Peninsula, N Borneo and Philippines; birds leave breeding areas from late Aug, with arrival in non-breeding quarters from Sept to mid-Oct; most return to breeding areas mid-May to early Jun. S populations also move farther S. Annual vagrant in NW Europe (e.g. Faeroes, Norway, Finland, Germany, Poland, British Is) and in Middle East, less frequently in Mediterranean region (Balearic Is, Malta, Cyprus). Casual migrant in W USA on St Lawrence I and Pribilofs, rare on W Aleutians.
Status and Conservation. Not globally threatened. Common to locally common. European population (NW Russia) estimated to be 35,000-40,000 breeding pairs. In N of range, highest recorded densities in N taiga zone, where typically 2-4 breeding pairs/km² in primary forest habitats. No comparable data available for rest of range, but a common breeding visitor in Himalayas. No evidence for any major change in status.
Bibliography. Ali (1969, 1996), Ali & Ripley (1998), Ali *et al.* (1996), Alström & Mild (2003), Armstrong (1983), Brazil (1991), Carey *et al.* (2001), Cramp (1988), Danielsen *et al.* (1994), Deignan (1945), Delacour & Jabouille (1940), Dementiev *et al.* (1970), Dickinson *et al.* (1991), Drijvers *et al.* (1999), Duckworth *et al.* (1999), Eames &

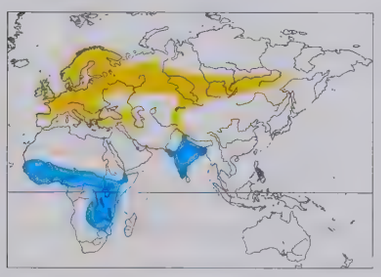
Robson (1992), Étchécopar & Hüe (1983b), Evans, Dutson & Brooks (1993), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Heath & Evans (2000), Heath *et al.* (2000), Helbig (1987), Imamura & Mitsunaga (2004), Inskipp & Inskipp (1991), Javed & Rahmani (1998), Jeyarajasingam & Pearson (1999), de Juana (2003), Kennedy *et al.* (2000), Knaus & Balzari (1999), La Touche (1931-1934), Lekagul & Round (1991), MacKinnon & Phillipps (1993), Majumdar *et al.* (1992), McClure (1998), Medway & Wells (1976), Meyer de Schauensee (1984), Mosimann-Kampe (2000), Nievergelt *et al.* (1999), Olsen (1999), Pardo & Gogorza y González (1997), Paz (1987), Ripley (1948, 1982), Roberts (2002), Robson (2000), Rogacheva (1992), Scott (1994), Skakuj & Stawarczyk (1997), Smythies (1986, 1999), Snow & Perrins (1998), Stepanyan (1990), Stephan (1988), Wang Wen *et al.* (2002), Whistler (1925), Zheng Guangmei & Zhang Cizu (2002).

36. **Tree Pipit**

Anthus trivialis

French: Pipit des arbres **German**: Baumpieper **Spanish**: Bisbita Arbóreo
Other common names: Brown Tree Pipit, Eurasian Tree Pipit

Taxonomy. *Alauda trivialis* Linnaeus, 1758, Sweden.
Appears to be very closely related to *A. hodgsoni*. E populations, slightly larger in size and paler in colour, with larger chest streaks and less pointed wing than nominate, sometimes treated as race *sibiricus*, but variation evidently clinal; similarly, proposed races *salomonseni* (from Scotland) and *differens* (NE Turkey) included in nominate; described race *burzil* (Kashmir) considered indistinguishable from *haringtoni*. Three subspecies recognized.
Subspecies and Distribution.
A. t. trivialis (Linnaeus, 1758) - breeds from N & W Europe (except Iceland and Ireland) E to L Baikal and middle R Aldan (possibly to upper R Kolyma) and, in S, from N Mediterranean and N Turkey E to Transcaucasus and N Iran; winters in sub-Saharan Africa and in India.
A. t. schlueteri Kleinschmidt, 1920 - breeds in mountains from E Kazakhstan and NW China (Tarbagatay and Dzungharskiy Alatau) S to Tien Shan and E Afghanistan; winters in C India.
A. t. haringtoni Witherby, 1917 - breeds NW Himalayas (Kashmir E to Garhwal); winters in Indian Subcontinent.



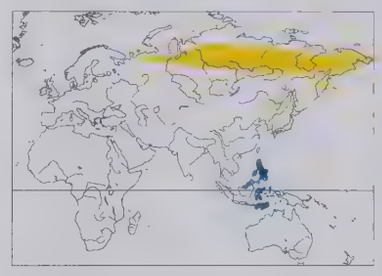
Descriptive notes. 14-15 cm; 15-39 g. Slim, medium-sized pipit with strongly streaked breast, rather heavy bill. Nominate race has buffish supercilium and lores, brown and buff ear-coverts, and blackish-brown malar stripe; olive-brown above, top of head to mantle and scapulars streaked dark brown, back more lightly streaked, rump unstreaked; primaries and secondaries dark brown with narrow pale buff edges, tertials and greater and median wing-coverts brown, edged whitish, lesser coverts brown, edged buff; tail dark brown, T5 with small white spot on inner web, T6 white on outer web and most of inner web; whitish below, pale buff wash on, particularly, breast and flanks, heavy blackish-brown streaking on breast, narrower and more sparse streaks on flanks; underwing-coverts and axillaries dusky grey with pale buff fringes; iris blackish-brown; bill dark brown, pale flesh-coloured base of lower mandible; legs pale brownish-flesh. Differs from *A. pratensis* mainly in more olive tone above, bolder supercilium, thinner streaks on flanks, heavier bill, shorter hind claw. Sexes alike. Immature is more buff-brown, less olive, above, pale feather edgings often giving slight scaly effect, paler below. Race *schlueteri* differs from nominate in having blunter wing and longer tail, broader dark streaks and paler olive-grey fringes on upperparts, more heavily streaked black underparts, also wider and deeper base of bill; *haringtoni* resembles previous, but slightly paler above, streaks below extend farther down on flanks, differs from nominate race in more earth-brown (less olive) upperparts, paler fulvous breast and flanks, heavier streaking on breast. Voice. Song, from treetop or in flight, up to 8 seconds long, a series of trills and repeated notes, has several contrasting sections, generally ending with far-carrying "seee-er, seee-er, seee-er". Call a single drawn-out "tseep" or "teez" in flight or when alarmed; also high-pitched "seet-seet-seet".
Habitat. Breeding habitats include woodland edge, open woodland, cleared woodland and young conifer plantations, often with isolated remaining tall trees, also heathland or grassland with developing scrub and trees; from sea-level to just above tree-line, to 2300 m in S Europe (Alps); at 2800-4000 m in Himalayas (race *haringtoni*). On passage favours similar habitats, as well as more open areas. In non-breeding season, occurs in cleared areas in forest, in open savanna, and in cultivation and coffee plantations with tall shade trees; occasionally found in montane grassland with scattered bushes in Malawi; to 3000 m in Africa.
Food and Feeding. Food includes a range of invertebrates, mostly insects; also some plant material in winter. Nestlings fed exclusively with invertebrates. In six dietary studies in Eurasia, beetles (Coleoptera), especially weevils (Curculionidae), were the most important prey. In analysis of stomach contents of 60 birds from Russia, curculionids were found in 75%, bugs (Hemiptera) in 42%, leaf beetles (Chrysomelidae) in 37% and caterpillars in 33%; other prey occurring in 10-18% of stomachs were click beetles (Elateridae), grasshoppers (Orthoptera), ground beetles (Carabidae), chafers (Scarabaeidae) and spiders (Araneae); less common items included rove beetles (Staphylinidae) and nocturnal ground beetles, small flies (Diptera), ants (Hymenoptera), snails, plant seeds. Other prey in Palearctic Region include earwigs (Dermaptera), lacewings and snake flies (Neuroptera), caddis flies (Trichoptera), harvestmen (Opiliones) and millipedes (Diplopoda). In African non-breeding quarters, grasshoppers, beetles, lepidopterans, bugs and termites (Isoptera) are important prey; stomachs of birds from Zimbabwe contained, among other items, leaf beetles (Chrysomelidae), weevils and other coleopterans, larval and adult butterflies and moths (Lepidoptera), and heteropteran bugs. Plant material taken in breeding range includes fruits, e.g. of bilberry (*Vaccinium myrtillus*), buds of aspen (*Populus tremulus*), and seeds of pine (*Pinus*) and birch (*Betulus*); millet (*Panicum*) grain as well as nectar of *Erythrina* taken in Africa. Forages mostly on ground, mainly among leaf litter and low herbage, also occasionally on twigs, branches and trunks of trees and on stumps. Often in small to medium-sized flocks on passage and in winter.
Breeding. Season late Apr to Aug in NW Europe, May to end Jul in India; often two broods, rarely three. Monogamous, occasionally polygamous; territorial. In song flight, male makes angled ascent from tree perch to c. 15 m, occasionally to 30 m or more, descends in parachute fashion, alights on same perch or another one. Nest built by female, a substantial cup of dry grass, often with moss foundation, lined with finer grasses, placed in depression in ground. Clutch 2-8 eggs, usually 4-6; incubation by female, period 12-14 days; chicks fed by both parents, fledging period 12-14 days, but chicks often leave nest several days earlier. Success rates of 54-72% reported (74-87% of eggs hatch, from which 73-83% of chicks fledge). Nests parasitized by Common Cuckoo (*Cuculus canorus*).
Movements. Long-distance migrant. W populations of nominate race migrate to Afrotropics, spending non-breeding season in region from W Africa E to Ethiopia and, in E Africa, S to W Angola, NE Botswana and NE South Africa; a few move only as far as Mediterranean region and in Persian Gulf states; E populations move to Indian Subcontinent. Both *schlueteri* and *haringtoni* winter wholly in India. Leaves breeding grounds in Aug-Sept, main passage in W Mediterranean during Sept, in Middle East during mid-Sept to late Oct, peak arrival in S parts of Africa in late Oct and early Nov; departure from wintering areas from Feb/Mar, arrives in C Europe from early Apr, reaching N parts of breeding range in May. E migrants reach Indian Subcontinent in late Aug and early Sept, departing from mid-Mar to early May. Vagrants recorded N to Spitsbergen and E to extreme NW USA (Alaska) and Japan; also on several islands of E Atlantic, including Madeira and Cape Verde Is.
Status and Conservation. Not globally threatened. Common throughout range. European population recently estimated at c. 17,000,000 pairs, excluding c. 10,000,000 pairs in European Russia; over 4,000,000 pairs in Sweden alone. European population has probably remained stable since 1970, with decreases or increases in only a few countries. Marked decline noted in Netherlands since 1900, and declines have occurred also in England, N Finland and Switzerland; by contrast, range expansion recorded in Scotland during 20th century. Expansions and fluctuations due partly to changing nature of habitats; for example, newly planted conifer forest on upland moorland may cause local increases, but, as trees mature, numbers of this pipit decrease, only to increase again when clear-felling and replanting take place; recently coppiced broadleaf woodland can also cause temporary local increases. No apparent threats in wintering areas; in Africa, clearance of forest for agriculture may, if scattered trees retained, provide more suitable habitat than that offered by dense-canopy forest.
Bibliography. Adamian & Klem (1999), Ali & Ripley (1998), Alström & Mild (2003), Archer & Godman (1937-1961), Ash & Miskell (1998), Balatsky (1985), Bannerman (1953), Benson (1946a), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Bub (1952), Cheke & Walsh (1996), Christy & Clarke (1994), Cramp (1988), Dean (2000), Dementiev *et al.* (1970), Dierschke (1994), Dowsett & Dowsett-Lemaire (1993), Elgood *et al.* (1994), Étchécopar & Hüe (1983b), Gatter (1997), Ginn *et al.* (1989), Glutz von Blotzheim (1992, 2000), Goodman *et al.* (1989), Gore (1990), Grimes (1987), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Heinroth & Steinbacher (1952), Hickling (1983), Irwin (1978), Keith *et al.* (1992), von Lehmann (1951), Leske & Lederer (1988), Loske (1985, 1987a, 1987b), Ma Ming *et al.* (2000), MacKinnon & Phillipps (2000), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Meury (1989a, 1989b, 1990, 1991), Nikolaus (1987), Nowakowski (2000), Olsen (1999), Paetzold (1990), Penry (1994), Porter (1983), Ripley (1982), Roberts (1992), Robson (2000), Shepherd (2002), Shurupov (1985), Sinclair & Hockey (1996), Snow & Perrins (1998), Steinfatt (1941), Tree (1975), Van Hecke (1979a, 1979b, 1980a, 1980b, 1981), Yablonovska (1993), Zink (1973-1985).

37. **Pechora Pipit**

Anthus gustavi

French: Pipit de la Petchora **German**: Petschorapieper **Spanish**: Bisbita del Pechora
Other common names: Siberian Pipit; Menzbier's Pipit (*menzbieri*)

Taxonomy. *Anthus gustavi* Swinhoe, 1863, Amoy, China.
Relationships unclear; possibly close to *A. hodgsoni* and *A. trivialis*. Race *menzbieri* considered a separate species by some taxonomists. Race *stejnegeri*, of which *commandorensis* a junior synonym, doubtfully separable from nominate. Three subspecies recognized.
Subspecies and Distribution.
A. g. gustavi Swinhoe, 1863 - breeds N Russia from NW of Urals (W of R Pechora) E to Chukotsk Peninsula, S to middle R Yenisey, middle R Lena and Kamchatka; migrates to Philippines, N Borneo and Wallacea.
A. g. stejnegeri Ridgway, 1883 - breeds Commander Is; migrates probably to E Asia.
A. g. menzbieri Shulpin, 1928 - breeds Russian Far East (middle Amur Valley, S Ussuriland) and extreme NE China (E Heilongjiang); wintering area unknown.



Descriptive notes. 14 cm; 19·8-26 g. Distinctive pipit with heavily striped upperparts. Nominate race breeding has long, narrow buffish supercilium, ochre-buff ear-coverts indistinctly streaked and spotted black, thin black malar stripe, large black patch on side of lower throat; forehead and crown black, distinctly streaked buffy, hindneck buff, streaked black; mantle and scapulars black with broad whitish fringes, forming distinctive pale "braces" on mantle with parallel pale bar on outer side running along anterior half; back, rump and uppertail-coverts rufous-buff to yellow-buff, sharply streaked black; wing feathers brownish-black, fringed greyish and olive-brown, greater and median wing-coverts with pale tips forming wingbars (greater-covert bar less distinct); tail blackish, T5 grey with pale distal half of inner web, T6 with outer web greyish or isabelline, distal half of inner web buffy or pale isabelline, proximal half dark grey; mainly buffy below, more creamy or white on centre of belly, prominent black streaks on breast, belly side and flanks; axillaries and underwing-coverts greyish, suffused with buff; iris brown to dark brown; upper mandible dark horn-brown, lower mandible paler; legs pale horn, grey, pinkish or yellowish. Distinguished from most other pipits by more heavily streaked upperparts; from *A. cervinus* (non-breeding plumage) mainly by blacker, broader and more sharply defined streaks above, with more distinct white "braces". In non-breeding plumage has less bright pale streaking above, whiter wingbars, paler underparts. Sexes alike. Immature has less clearly defined streaking below, streaks extending to throat and belly. Race *stejnegeri* is slightly larger and paler than nominate; *menzbieri* has shorter wing, is more extensively black above with narrower and paler feather edgings, deeper yellow-buff below, deeper buff undertail-coverts. Voice. Song, in flight, less often from perch or ground, rather quiet, a rapid trill as that of Wood Warbler (*Phylloscopus sibilatrix*), followed by low throaty warble, or alternated with long buzzing rattles, variable; *menzbieri* a low-pitched, muted buzzing, e.g. "ppdzhzhzhzhzhzhzhzheep-zhzhzheepp" or "cheep-cheecheecheezhzhzhzhzh cheenee" and other variations, sometimes likened to song of Grasshopper Warbler (*Locustella naevia*); *stejnegeri* also variable, e.g. "zi-zi-zi-zi-zeerrrrrrrr-zezezezeze" heard, and likened to song of River Warbler (*Locustella fluviatilis*), but reported also as resembling song of *A. trivialis* or of an *Emberiza* bunting; degree to which races differ vocally uncertain. Call a sharp, hard "pwit" or "pit", lower-pitched and softer than call of *A. pratensis*, usually repeated 2-3 times.
Habitat. Breeds in bushy tundra and taiga swamps with tall dense sedges, reeds, shrubs and even trees, in zone between tundra to N (inhabited by *A. cervinus*) and taiga forest to S (inhabited by *A. hodgsoni*); mainly in lowlands. In winter, found in wet grassy areas and open woodland.

Food and Feeding. Mainly insects, including dragonflies (Odonata), hymenopterans, beetles (Coleoptera), flies (Diptera, especially of families Tipulidae, Culicidae, Chironomidae, Tabanidae, Syrphidae), mayflies (Ephemeroptera), adult and larval moths (Lepidoptera); also other invertebrates, such as spiders (Araneae) and molluscs. In stomachs of five birds from Chukotsk Peninsula, hymenopterans formed 72·1% of items, various larvae 11·5%, beetles 8·2%, flies and molluscs each 3·3%, and craneflies (tipulids) 1·6%. Neck-collar and stomach samples from L Khanka (S Ussuriland) comprised, by number, 32% flies, 24·2% larval and adult lepidopterans, 14·3% spiders, 9·5% molluscs, 7·5% cicadas (Cicadidae), 6·3% grasshoppers (Orthoptera), 4·8% beetles, as well as a few sawflies (Symphyta) and caddis flies (Trichoptera); in 1977, 27·5% of samples contained spiders, 24·1% moths and 27·5% beetles; in 1978, spiders were found in 27·7% of samples, moths in 55·3% and flies in 67·1%. Forages mainly on ground, picking items from vegetation; reported also as foraging in tree branches in late summer. Skulks.

Breeding. Late Jun to Jul in Siberia; probably single-brooded. Apparently monogamous; territorial, although loose colonies have been reported. In song flight, male ascends high, usually to 30-70 m, then flies somewhat erratically in circles or small arcs, with rapid wingbeats, occasionally hovers. Nest a cup of grass and other leaves, lined with finer material, built on ground in low vegetation or in shelter of tuft of grass. Clutch 4-5 eggs, occasionally 6; incubation 12-13 days; nestlings fed by both parents for 12-14 days.

Movements. Migratory; winter range inadequately known. Passage migrants recorded in Japan, Korea, E China, Taiwan; winter records from Philippines, N Borneo, and widespread in Sept-Mar in Wallacea. Leaves N breeding grounds from mid-Sept, returns late May and Jun; S race (*menzbieri*) departs Aug-Oct, returns end Apr to end May. Several records from Japan; rare migrant in Hong Kong, and casual in spring in NW USA (W Alaska). Accidental in at least nine countries in W Europe, including Iceland and Lithuania; most records (c. 70) from Britain.

Status and Conservation. Not globally threatened. Widespread in subarctic tundra; little information on population levels, but reportedly not numerous. Difficult to locate owing to its secretive behaviour. No evidence for any recent contraction of range or population decline.

Bibliography. Alström & Mild (1989, 2003), Andreassen & Bryne (1978), Andrew (1992), Anon. (1998a), Armstrong (1983), Austin (1948), Brazil (1991), Carey (1989), Carey *et al.* (2001), Carter (2003), Coates & Bishop (1997), Cramp (1988), Danielsen *et al.* (1994), Dementiev *et al.* (1970), Étchécopar & Hüe (1983b), Evans, Dutson & Brooks (1993), Evans, Magsalay *et al.* (1993), Heard & Walbridge (1988), Heath & Evans (2000), Heath *et al.* (2000), Inskipp *et al.* (1996), Karnas & Skakuj (1988), Kaufman (1996), Kennedy *et al.* (2000), Lambert (1994), Leonovich *et al.* (1997), Lewington *et al.* (1991), MacKinnon & Phillipps (1993), Meyer de Schauensee (1984), Nazarov (1981), Pardo & Gogorza y González (1997), Portenko (1973), Riddiford & Ellis (1988), Riley (1997), Riley & Mole (2001), Rogacheva (1992), Smythies (1999), Snow & Perrins (1998), Sonobe (1982), Stepanyan (1990), Wassink (1986), Watling (1983), White & Bruce (1986), Williams (1986), Won Pyongoh (1993), Zhang Cizu *et al.* (1997).

38. **Water Pipit**

Anthus spinoletta

French: Pipit spioncelle **German**: Bergpieper **Spanish**: Bisbita Alpino
Other common names: Mountain Pipit(!)

Taxonomy. *Alauda Spinoletta* Linnaeus, 1758, Italy.

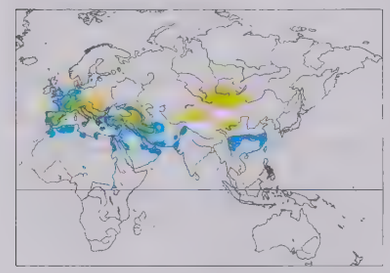
Possibly forms a clade with *A. pratensis*, *A. roseatus*, *A. cervinus*, *A. petrosus* and *A. rubescens*. May form a superspecies, and until recently treated as conspecific, with last two of those. Birds from NW Caucasus sometimes separated as race *caucasicus*, but considered inseparable from *coutellii*. Three subspecies recognized.

Subspecies and Distribution.

A. s. spinoletta (Linnaeus, 1758) - breeds in mountains of C & S Europe; winters W & S Europe and NW Africa.

A. s. coutellii Audouin, 1828 - breeds N, S & E Turkey, Caucasus and mountains of N Iran and Turkmenistan (Kopet Dagh); winters in neighbouring lowlands and S to NE Africa and Arabia.

A. s. blakistoni Swinhoe, 1863 - breeds in mountains of S Russia (E to Transbaikalia), Mongolia, E Kazakhstan, Tadjikistan, Kyrgyzstan, and NW & C China (W Xinjiang, Qinghai); migrates to Pakistan, NW India and S China.



Descriptive notes. 15-17 cm; 18·7-23 g. Nominate race in breeding plumage has mid-grey to brownish-grey forehead to nape and ear-coverts, contrasting broad whitish supercilium; upperparts greyish-brown, mantle with faint dark streaks; remiges and upperwing-coverts blackish-brown with warm brown edges, median and greater coverts with paler tips; tail blackish-brown, T5 with small white tip, T6 with whitish outer web and distal part of inner web; throat whitish, dark malar streak usually faint or lacking (variable); lower throat and breast to upper flanks and upper belly pale pinkish-buff, occasionally slight dark streaking on breast, rest of underparts whitish; underwing-coverts and axillaries white; iris and bill blackish-brown; legs dark brown or blackish-brown. In non-breeding plumage, grey of head is replaced by brown or grey-brown with thin darker streaks, supercilium less distinct, has narrow dark malar stripe and patch, warm brown upperparts indistinctly streaked dark (except on rump), whitish underparts streaked dark brown on breast and flanks; base of lower mandible usually paler, yellowish. Sexes similar, female on average more brownish, less grey, on head. Immature resembles non-breeding adult, but browner and with more obvious streaking above, darker streaking below. Race *coutellii* is smaller than nominate, slightly paler and more streaked above, whitish colour on outer tail feather tinged greyish, in summer plumage has pinkish colour of underparts more rufous-tinged and more extensive; *blakistoni* is larger and paler than previous, with less heavy streaking, and whiter areas on outer rectrix. VOICE. Song, from perch or in flight, a rattling and tinkling series of 4-5 segments, each of one type of monosyllabic or disyllabic note, e.g. "dwis", "wiss-wiss", "siib", "zi-zi", " bit", "dwee", full song 9-12 seconds long and has been transcribed as "vitt vitt vitt-vitt-vitt vietviet viet viet... tri tri tri tri tri... tsia tsia tsia tsia" or with final part a rattled repeated "rirrt"; generally intermediate between those of *A. pratensis* and *A. trivialis*, and both louder and more melodious than former's. Call a single or double short, sharp, unmusical "(h)isst", "wisst", "dzip", "tsi", "tsiip", "tsupi" or "chui", more grating than call of *A. pratensis*, often repeated several times when bird flushed; other calls include "psri", "psiet", "psscht"; in non-breeding season also "tslp" or "pheet".

Habitat. Breeds on alpine pastures and high-lying mountain meadows with short grassland and scattered rocks, bushes or trees, usually with some wet areas, often on mountain slopes; also stony scree with thickets in far E of range; at 615-3200 m, mainly 1400-2500 m. In winter found on coastal saltings, lagoons, marshes, grassy edges of lakes and rivers, sewage farms, watercress farms, rice fields and other irrigated cultivation, often in association with *Motacilla flava*; occasionally on arable land; lowlands and to 2000 m.

Food and Feeding. Invertebrates; some plant material. In W Europe prey includes springtails (Collembola), stoneflies (Plecoptera), crickets and grasshoppers (Orthoptera), bugs (Hemiptera), lacewings and snake flies (Neuroptera), scorpion flies (Mecoptera), butterflies, moths and caterpillars (Lepidoptera), caddis flies (Trichoptera), cicadas (Cicadidae), aphids (Homoptera), psocids (Psocoptera), flies (Diptera), sawflies and ants (Hymenoptera), beetles (Coleoptera), spiders (Araneae), harvestmen (Opiliones), centipedes (Chilopoda), millipedes (Diplopoda), snails (Mollusca), *Gammarus* amphipods (Crustacea) and worms (Annelida); algae, berries and seeds also eaten, and in a study on the Poland-Czech Republic border algae formed up to 75% of food by volume in late summer. Neck-collar samples of nestling diet in two study areas, one in Switzerland and the other in C Asia (Tien Shan Mts), showed dipterans and lepidopterans as numerically important in both areas, with psocids also important in Tien Shan Mts. In a neck-collar study in Moravia, three groups of insects were predominant, with dipterans accounting for 36·5% of items, lepidopterans 33·4% and homopteran bugs 21·6%; average length of prey was 8·3 mm; in poor weather, caterpillars and adults and larvae of scatophagid flies became more important. Forages on the ground, picking up insects and other small invertebrates; occasionally jumps up to take flying insects, or flies out from a perch to catch prey. In severe weather in high mountains, feeds around burrow entrances of marmots (*Marmota*). During breeding season, foraging bouts are more frequent and flight distances greater when weather conditions poor. Generally forages singly or in pairs, sometimes in small groups.

Breeding. Lays end Apr to early Jul in Europe; sometimes double-brooded. Mainly monogamous, occasionally polygynous or polyandrous. In song flight, male rises diagonally to 10-30 m, flies in circle or arc, descends in long looping glide. Nest built mainly by female, sometimes helped by male, a cup of grass stems and leaves, some moss incorporated, lined with finer material and some hairs, placed on ground in side of a bank or hollow, usually well concealed by vegetation, sometimes at end of a tunnel. Clutch 4-6 eggs, occasionally up to 8, mean in former USSR 5·33; incubation by female only, period 14-15 days; chicks brooded by female and fed by male for first few days, thereafter fed by both parents, nestling period 14-15 days. In Europe, 39% of nests in one study were preyed on by stoats (*Mustela erminea*) and snakes, and in another study long-tailed weasels (*Mustela frenata*) and deer mice (*Pesomyscus maniculatus*) were responsible for heavy losses of both eggs and nestlings.

Movements. Predominantly a short-distance or altitudinal migrant; regular migration from high mountains down to lowlands in autumn. Nominate race winters mainly in W & S Europe, including Britain, and S to NW Africa (E to NW Libya); marked site-fidelity reported at wintering locations in NW Europe. Race *coutellii* winters in lower-lying parts of Asia Minor and Caucasus region, also migrates S to Middle East, NE Africa, Arabia and W & S Iran; E breeders (*blakistoni*) winter mostly in Pakistan, extreme NW India and S China (S of R Yangtze). Main departure from breeding areas from mid-Sept, slightly earlier in E (*blakistoni*); peak passage through Middle East from late Oct to late Nov; return northwards begins from Feb-Mar, arrival in breeding areas mainly Apr-May.

Status and Conservation. Not globally threatened. Locally common to fairly common. Patchy distribution in Europe due to altitudinal and habitat requirements, resulting in small isolated populations, together estimated as totalling c. 258,000-351,000 pairs; highest densities range from 2·4 pairs/10 ha in Jura Mts (Switzerland) to 3-3·6 pairs/10 ha in the Alps and to 4·5 pairs/10 ha in prime habitats in the Polish Tatras. Since 1960s several relatively low-altitude populations have been discovered where territories overlap with those of *A. pratensis*; despite potential competition, no evidence for any change in distribution or status of present species. No data on numbers elsewhere (races *coutellii* and *blakistoni*), but species appears to be fairly widespread in suitable habitat and not uncommon; race *blakistoni* possibly breeds also in NE Afghanistan, but confirmation needed.

Bibliography. Adamian & Klem (1999), Ali & Ripley (1998), Alström & Mild (1996, 1997a, 2003), van den Berg (1975), Biber (1982, 1986), Bijlsma (1977), Böhm (2000), Böhm & Landmann (1995), Bollmann (1996, 1998), Bollmann & Reyer (2001), Bollmann *et al.* (1997), Brodmann & Reyer (1999), Brodmann, Reyer & Baer (1997), Brodmann, Reyer, Bollmann *et al.* (1997), Bureš (1993, 1994b, 1997), Bureš *et al.* (2002), Catzeflis (1978), Cramp (1988), de Crousaz (1966), Dementiev *et al.* (1970), Denkinger (1994), van der Elst (1993), Étchécopar & Hüe (1964, 1983b), Flint & Stewart (1992), Flury *et al.* (1992), Frelin (1983), Glutz von Blotzheim (1962, 2000), Goodman *et al.* (1989), Gressel & Petersen (1981), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Handrinos & Akriotis (1997), Heath & Evans (2000), Heath *et al.* (2000), Heinroth & Steinbacher (1952), Hirschfeld (1995), Hüe & Étchécopar (1970), Jakobs (1969), Keith *et al.* (1992), Knox (1988), Königstedt & Muller (1983), Koning (1982), Kovshar (1979), Meyer de Schauensee (1984), Nazarenko (1978), Norton (1958), Pätzold (1984), Paz (1987), Rauter & Reyer (1997), Rauter *et al.* (2002), Rehsteiner *et al.* (1998), Reyer *et al.* (1997), Ringleben (1957), Roberts (1992), Sangster, Hazevoet *et al.* (1999), Sangster, Knox *et al.* (2002), Snow & Perrins (1998), Stepanyan (1990), Tellería *et al.* (1999), Thévenot *et al.* (2003), Vázquez (2003), Verbeek (1970, 1988), Villarán (1999), Walasz & Mielczarek (1992), Wartmann (1990), Winding (1990), Witt (1982), Zheng Guangmei & Zhang Cizu (2002).

39. **Rock Pipit**

Anthus petrosus

French: Pipit maritime **German**: Strandpieper **Spanish**: Bisbita Costero
Other common names: European Rock Pipit; Scandinavian Rock Pipit (*littoralis*)

Taxonomy. *Alauda petrosa* Montagu, 1798, coast of Wales.

Possibly forms a clade with *A. pratensis*, *A. roseatus*, *A. cervinus*, *A. spinoletta* and *A. rubescens*. May form a superspecies, and until recently treated as conspecific, with last two of those. Variation somewhat clinal, from longer-billed darker birds at NW edge of range to shorter-billed and paler ones in NE; race *kleinschmidti* sometimes merged with nominate. Proposed races *meinertzhageni* (described from South Uist, off W Scotland), *hesperianus* (Arran, off W Scotland) and *ponens* (NW France) considered inseparable from nominate. Three subspecies recognized.

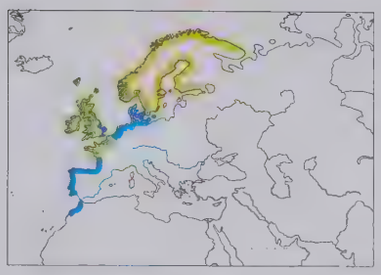
Subspecies and Distribution.

A. p. kleinschmidti Hartert, 1905 - Faeroes and outlying Scottish islands of Shetland, Orkney, Fair Isle and St Kilda.

A. p. petrosus (Montagu, 1798) - coasts of Ireland, Britain (except SE), Channel Is and N & NW France.

A. p. littoralis C. L. Brehm, 1823 - breeds coasts of Fennoscandia and NW Russia; winters W European coasts (S from S Scandinavia) and NW Africa.

Descriptive notes. 16·5-17 cm; 18-32·5 g. Nominate race has narrow, broken whitish eyering, sometimes hint of pale supercilium, grey-brown to olive-brown lores and ear-coverts, pale buff submoustachial stripe, indistinct brown malar stripe; dark olive-grey above, head lightly and thinly



streaked dark, mantle indistinctly streaked dark, rump more olive and plainer; remiges, primary coverts and greater wing-coverts blackish-brown, edged olive-grey, median coverts blackish, tipped olive-grey, lesser coverts dark grey, tipped olive-grey; tail dark brown, T5 with small grey tip, T6 with pale greyish outer web and tip of inner web; chin creamy; underparts light buff to dirty buffish, breast and flanks with heavy but diffuse dark brown streaking (often rather duller below in winter); underwing-coverts and axillaries grey, fringed creamy; iris blackish-brown; bill blackish; legs black to dark brown or dark-reddish-brown. Sexes alike. Immature resembles adult, sometimes browner and more obviously streaked above. Race *kleinschmidti* differs from nominate in having slightly yellower, less olive, tinge above, brighter and yellower ground colour below; *littoralis* has usually more obvious supercilium than nominate, paler wedge on outer rectrix (variable), summer plumage variable, often like nominate, but some are greyer above and have breast pinkish to vinous with streaking reduced or, rarely, almost absent (approaching *A. spinoletta* in appearance). Voice. Song, in flight, a sequence of sharp notes repeated in series, with several theme changes, usually with terminal trill, rather similar to that of *A. pratensis* but louder and with introductory notes slightly lower-pitched; one recording likened to "cheep cheep" followed by 27 double harsh "cheep-a" notes, 16 thin musical "ge" or "gee" notes rising in pitch, 12 higher-pitched "psee", 10 lower-pitched musical notes, and finally three dry rattles, the song lasting 18 seconds. Call a sharp "wiisst", "phi(s)t" or "tsup", lower-pitched and more metallic than that of *A. pratensis* and usually given as single or double call; alarm a high-pitched shrill "chip", "chick" or "ssit".

Habitat. Exposed rocky sea coasts and islands with low vegetation; occasionally breeds away from coast, e.g. up to 400 m inland on St Kilda (W Scotland), or on islands in large inland lakes, e.g. in S Sweden. Sometimes occurs inland along estuaries and at various wetlands, as well as on less rocky coasts, during passage and in winter.

Food and Feeding. Prey comprises a range of invertebrates, from terrestrial snails and slugs (Mollusca), worms (Annelida), small crabs and other crustaceans, and small fish, to aphids (Homoptera), flies (Diptera) and adult and larval beetles (Coleoptera); also seeds. In one study in SW England (Cornwall), periwinkles (*Littorina neritoides*), chironomid larvae, larvae of the kelp fly *Coelopa* and isopods (*Idotea*) were the four common littoral foods taken; amphipod larvae (Talitridae) were sometimes important in late summer. Amphipods important prey in Ireland and Scotland. Wintering concentrations in the Netherlands fed almost exclusively on the mollusc *Asiminea grayana*; winter diet in Norway mostly crustaceans. Forages mainly on the shore, searching among seaweed and on rocks in intertidal area; also on cliff tops in summer. Will wade in sea water, following receding waves to find prey. Also observed to follow a tractor moving pebbles on beach, and to pick up prey exposed by machine's activity. Makes short sallies to take flying insects, but rarely pursues insects far in flight. Usually forages singly or in small loose groups.

Breeding. Mid-Mar to Aug, varying with latitude, from Jun in far N; double-brooded in S of range. Monogamous, but polygyny reported in Sweden (race *littoralis*); territorial. In song flight, male rises to c. 15-30 m, then either flutters forward or in circle for variable distance, or immediately descends in parachute fashion to rock or ground. Nest, built by female, a bulky cup of grass stems, leaves and seaweed, rather flimsily lined with finer material, placed in crevice in cliff, or in small cavity on bank or grassy slope, or under rock or clump of vegetation. Clutch 4-6 eggs; incubation usually by female alone, occasionally assisted by male, period 14-15 days; chicks fed by both parents, fledging period 16 days; fledglings attended by both adults for several days. Average productivity in Britain 2·5 young per pair; in NW France, juvenile mortality more than 68%, and majority of chicks did not survive for more than 4 weeks after fledgling.

Movements. Resident and migratory. Nominate race largely resident, with some short-distance dispersal; *kleinschmidti* may move short distances inland to rivers and lakes or to sandy shores. Most populations of *littoralis* migratory, winter on coasts from S Norway and SW Sweden S to SW Europe, a few reaching NW Africa (Morocco); departure from breeding grounds Sept-Oct, return from Mar onwards, arrival in extreme N not until May. Stragglers recorded in Spitsbergen, Iceland, Canary Is, Mediterranean islands, and several countries in interior of C Europe.

Status and Conservation. Not globally threatened. Common. Global population estimated at c. 408,000 pairs, of which majority (c. 300,000) in Norway. Densities vary from 0·9 to 6 pairs/km of coast; c. 5 pairs/km of favoured coastal habitat in Cornwall (SW England) and 5-6 pairs/km in Loch Sunart (W Scotland). British population has slightly declined since mid-1970s; apparently stable elsewhere. Expansion of range to N in Finland between 1970 and 1990, but this stopped at Quark, probably because of lack of seaweed in Gulf of Bothnia. Few threats to habitat; locally, oil pollution on rocky shores can have adverse effect on this species' invertebrate prey, but generally only temporarily.

Bibliography. Alström & Mild (1996, 1997a, 2003), Arvidsson *et al.* (1997), Askenmo & Unger (1986), Askenmo *et al.* (1992, 1994), Biber (1986), Bijlsma (1977), Bourgonje (1994), Collett & Olson (1921), Cramp (1988), Dierschke (2002c), Duncan (1981), Elfström (1990, 1992, 1997), Étchécopar & Hüe (1964), Garoche & Sohier (2000, 2001, 2002), Garoche *et al.* (1997, 1998), Géroudet (1992), Gibb (1956), Gibbons *et al.* (1993), Hall (1961), Hario (1997), Heath & Evans (2000), Heath *et al.* (2000), Johansson & Larsson (2001), Keith *et al.* (1992), Knox (1988), Königstedt & Muller (1983), Koning (1982), Koskimies (1989), Larsson, L. & Strandvik (1986), Larsson, S. (1994), Sangster, Hazevoet *et al.* (1999), Sangster, Knox *et al.* (2002), Snow & Perrins (1998), Taylor (2002), Tellería *et al.* (1999), Thévenot *et al.* (2003), Tutt (1990).

40. Buff-bellied Pipit

Anthus rubescens

French: Pipit d'Amérique **German**: Pazifikpieper **Spanish**: Bisbita Norteamericano
Other common names: American (Water/Rock) Pipit; Siberian (Water) Pipit (*japonicus*)

Taxonomy. *Alauda Rubescens* Tunstall, 1771, Pennsylvania, USA.

Possibly forms a clade with *A. pratensis*, *A. roseatus*, *A. cervinus*, *A. spinoletta* and *A. petrosus*. May form a superspecies, and until recently treated as conspecific, with last two of those. Recent DNA studies, as well as plumage differences, suggest that races may represent more than one species. On the other hand, *pacificus* is doubtfully distinct from nominate in terms of morphology, and merged with latter by some authors. Geographical border between nominate race and *japonicus* uncertain, and population breeding in extreme NE Siberia possibly belongs with former; further study needed. Proposed race *geophilus* (from Aleutians) synonymized with nominate; *haermsi*, described on basis of specimen from non-breeding area in C Asia (E Uzbekistan), considered better treated as synonym of *japonicus*. Four subspecies recognized.

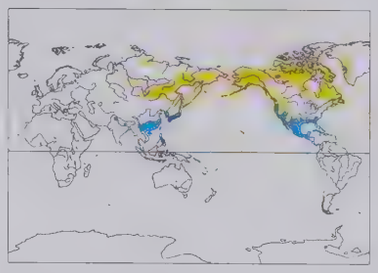
Subspecies and Distribution.

A. r. japonicus Temminck & Schlegel, 1847 - breeds N, C & E Russia in SE Taymyr, W Siberian Plateau, and from E of R Lena, Yakutsk region and L Baikal E to Chukotsk Peninsula, Commander Is, Sakhalin and Kuril Is; winters in S Asia.

A. r. pacificus Todd, 1935 - breeds W North America (Alaska, and Coast Range S to Oregon); winters S to W Mexico.

A. r. alticola Todd, 1935 - breeds C & S Rocky Mts (S from S British Columbia), also locally in mountains W to California (SW USA); winters S to Mexico.

A. r. rubescens (Tunstall, 1771) - breeds N & E Canada, W Greenland and extreme NE USA; winters S to Central America.



Descriptive notes. 14-17 cm; c. 21 g. Nominate race in breeding plumage has broad whitish supercilium tinged pinkish-buff, buffish submoustachial stripe, variable dark malar stripe and patch; grey above, slight dark streaking; wing feathers blackish, pale tips of wing-coverts forming two wingbars; tail blackish-brown, T5 with long white wedge on inner web, sometimes also white tip and white outer edge, T6 with white outer web and long white wedge on inner web; chin and throat pale buffish to pinkish; underparts orange-buff to deep pinkish-buff, variable amount of grey-brown streaking on breast and flanks; iris blackish-brown; bill blackish-brown; legs dark brown to blackish. Distinguished from *A. spinoletta* mainly by slightly smaller size, shorter bill, colour on underparts darker, more orange, and more extensive. In non-breeding plumage is grey-brown above, with dark streaking on back and scapulars somewhat heavier, wingbars more obvious, underparts whitish to rich brownish-buff, usually with more distinct dark streaking; legs sometimes pink-tinged. Sexes alike. Juvenile resembles non-breeding adult, but more distinctly streaked above, paler below, flanks less clearly streaked. Race *pacificus* is very similar to nominate, in breeding plumage underparts slightly yellower, less pinkish-buff, and with more distinct streaking, in non-breeding plumage slightly paler below and spotted rather than streaked, but much individual variation; *alticola* in breeding plumage has underparts darker orange-buff or more rufous-tinged and with sparse streaking, malar patch indistinct or lacking; *japonicus* differs from others in having pale, pinkish legs, in breeding plumage is more light rufous-cinnamon to pink-cinnamon below, distinct spots on cheeks, breast and flanks, in non-breeding plumage is darker greyish-olive above with more pronounced black feather centres on mantle and scapulars, more prominent (whitish) wingbars, usually more heavily marked below, where streaks and spots blacker, more sharply defined and more extensive. Voice. Song, in flight or from perch, a fast series of high notes repeated in phrases, e.g. "treeu-treeu-treeu", "pleetrr-pleetrr-pleetrr", "chwee-chwee", tsip-tsip-tsiru" and the like, continuing for up to c. 15 seconds. Call a high "sipit" or "sip" in flight; higher "tseep", sometimes rapidly repeated as "si-si-si-si-sif", when flushed; alarm near nest a rising "pwisp".

Habitat. North American races breed on treeless tundra with boulder-strewn fields and rocky areas, on barren coasts (Labrador), also on pastures and agricultural land to higher altitudes on mountain slopes farther S; to at least 2700 m. Winters in open, moist habitats along streams and lake edges, on fields, on saltmarshes and on beaches; on migration also on sandbars and open flats near rivers and lakes, on ploughed fields, mudflats, wet fields and wheat pastures. E Siberian race *japonicus* breeds on rocky alpine and subalpine tundra, to 2400 m; in winter favours moist grassland, marshes, irrigated cultivation, wetland edges.

Food and Feeding. Insects, including grasshoppers, crickets and locusts (Orthoptera), beetles (Coleoptera), bugs (Hemiptera), including plant-lice and aphids (Homoptera), also lepidopteran larvae, and ants (Hymenoptera); also other invertebrates, such as spiders (Araneae) and mites (Acarina), small molluscs and crustaceans; also small seeds and berries. Plant material taken mainly in autumn and winter. Forages on ground, by picking; also wades in shallow pools in search of aquatic invertebrates. Reported as eating dipteran larvae from rotting whale carcasses. Often in flocks outside breeding season.

Breeding. Laying mainly Jun-Jul. In brief song flight, male ascends to c. 20-30 m, glides back down to perch in long arc or loop. Nest built by female, male may bring material, a platform of dead grass with cup of fine grasses, often lined with hair, placed on ground in recess, or under rock or grass clump; new nest sometimes built on top of old one. Clutch 3-7 eggs, usually 4-6; incubation by female, period 14-15 days; chicks brooded only by female, fed by both parents, nestling period 13-16 days. Reported success rate 67% (74% of eggs hatched, and 77% of these produced fledglings); in Asia, nests parasitized by e.g. Common Cuckoo (*Cuculus canorus*), chicks sometimes die from infestation by blowfly (*Calliphora*) larvae.

Movements. Migratory. American races winter on W coast S from extreme SW Canada (S British Columbia) and from S USA S to N Central America; regular visitor in much of Mexico, including Baja California, less so in SE, and irregular to rare in Guatemala, El Salvador, Honduras and Jamaica. Leaves N breeding grounds mainly from late Aug and early Sept, reaching non-breeding quarters late Sept to Nov; returns N from Feb-Mar onwards, arrival in N of breeding range in May. Asian race *japonicus* migrates mainly to Japan, Korea and SE China, less commonly N Indochina, N Myanmar and N parts of Indian Subcontinent; apparently regular visitor also farther W, in Uzbekistan and Middle East (Israel); autumn arrival in Japan (Honshu) and Israel Oct-Nov, main departure Mar-Apr, spring arrival on breeding grounds mainly in May. Nominate race recorded as vagrant in at least five countries in Europe, also in NC & E Pacific Ocean (Hawaii, Clipperton I) and NW Atlantic (Bermuda); *japonicus* accidental in W USA, Europe (Sweden, Italy), NE Africa (Egypt) and several countries in SW Asia.

Status and Conservation. Not globally threatened. Common and widespread throughout most of range. Common to fairly common non-breeding visitor in Mexico; possibly breeds in NW Mexico (San Pedro Martír, in N Baja California). North American population recently estimated at more than 19,000,000 individuals. Has been suggested that global warming may have a negative impact on alpine breeding populations of this species in USA and Canada.

Bibliography. Ali & Ripley (1998), Alström & Mild (1996, 1997a, 2003), Amos (1991), Anderson (1989), Anon. (1998a), Arendt (1992), Armstrong (1983), Arnold (1984), Baicich & Harrison (1997), Bent (1950), Binford (1989), Brazil (1991), Campbell *et al.* (1997), Carey *et al.* (2001), Cassidy (1990), Clarke (1986), Conry (1976), Cramp (1988), Cyr (1995), DeGraaf & Rappole (1995), Dobson (2002), Drury (1961), Finch (1991), Grimmett *et al.* (1998), Hellmayr (1935), Hendricks (1987a, 1987b, 1991a, 1991b, 1997), Hendricks & Norment (1992, 1994), Howell & Webb (1995a), Hunter *et al.* (1997), Inskipp & Inskipp (1991), Kaufman (1996, 1998), King (1981), Knox (1988), Kutac (1989), Lee & Birch (2002), Lee Jones (2004), Maclean & Prys-Jones (1988), Martin (1998), Miller & Green (1987), Monroe (1968), Nazarenko (1978), Norris & Morgenson (1982), Peck & James (1987), Pétursson (1989), Pickwell (1947), Price *et al.* (1995), Rappole *et al.* (1995), Ripley (1982), Robson (1997, 2000), Rogacheva (1992), Root (1988), Sangster *et al.* (2002), Scott (1993), Shirihai (1999), Shirihai & Colston (1987), Small (1994), Smythies (1986), Snow & Perrins (1998), Stepanyan (1990), Sutton & Parmelee (1954), Tae (2002),

Taylor (1994), Terres (1982), Thönen (1999), Thurber *et al.* (1987), Verbeek (1970, 1981, 1996), Verbeek & Hendricks (1994), Vinicombe (2003), Woodell (1979).

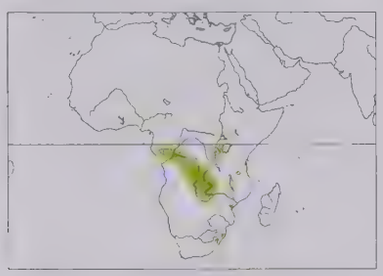
41. Short-tailed Pipit

Anthus brachyurus

French: Pipit à queue courte **German**: Kurzschwanzpieper **Spanish**: Bisbita Colicorto

Taxonomy. *Anthus brachyurus* Sundevall, 1850, upper Umlaas River, near Durban, South Africa.
May form a clade with *A. caffer* and *A. sokokensis*. Racial differences rather unclear, and correct assignation of population from S Tanzania disputed; proposed race *eludens* (WC DRCongo) not reliably separable from *leggei*. Two subspecies recognized.

Subspecies and Distribution.
A. b. leggei Ogilvie-Grant, 1906 - disjunct populations in E DRCongo, SW Uganda, Rwanda, N Burundi and extreme NW Tanzania; SE Gabon and S PRCongo through W & S DRCongo to NE Angola and N & C Zambia; and (probably this race) S Tanzania.
A. b. brachyurus Sundevall, 1850 - SC Mozambique (N of Beira); E South Africa (Mpumalanga and KwaZulu-Natal) and E Lesotho.



Descriptive notes. 11·5-12·5 cm; male 15·5-16·7 g, female 13·5-17·2 g. Small pipit with noticeably short tail; has been likened to female of a small bishop (*Euplectes*) or a large cisticola (*Cisticola*) in the field. Has indistinct pale supercilium, more obvious pale eyering; lores and ear-coverts dark olive; blackish upperparts with dull olive-buff feather edgings, rump dark olive-brown; wings blackish-brown, pale olive-buff edges of tertials and wing-coverts; tail dark brown, T5 tipped pale, T6 greyish-white; below, pale yellowish-buff, breast boldly streaked blackish, some streaking on throat, flanks and belly; underwing-coverts and axillaries pale yellowish-buff; iris brown; upper mandible dark brown, lower mandible flesh-coloured; legs flesh-coloured. Distinguished from *A. caffer* by shorter tail, shorter bill, darker (blackish) upperparts, white throat, more heavily streaked breast, more noticeable eyering. Sexes alike. Immature has whole of upperparts dark brown with narrow warm buff edgings, tertials and wing-coverts with sharply defined warm buffish-brown edges, underparts more broadly streaked. Race *leggei* differs from nominate in having feathers of upperparts less strongly edged with olive-buff, heavier streaking below. Voice. Song, in flight, a high, rapid, rather grating series of phrases, "tuweehweeh-weeh wheeh threeohweeh", or series of nasal notes, "bzip, bzeent, bzeeu", or rolling "tip-pee-reep-pip-rip"; wing-snaps in aerial display. Call soft, nasal "tseep".

Habitat. Short open grassland less than 15 cm in height. Moist, often seasonally inundated grassland preferred, but occurs in Zambia on sparsely vegetated ground on sandy soils, or on recently burnt ground. Sea-level to above 1800 m, mainly 800-1500 m.

Food and Feeding. Insects and their larvae, also grass seeds (Gramineae). Forages on ground. The most terrestrial of the small pipits, inconspicuous and elusive; flies reluctantly when disturbed, and soon lands in grass and moves away quickly under cover. Generally solitary, occasionally several together in loose aggregation; does not consort with other pipits.

Breeding. Poorly known. Breeds in the rains, in Dec in Angola, Nov-Feb in DRCongo, Nov-Dec in S Tanzania (Iringa highlands) and Sept-Jan in South Africa; one was in breeding condition in Dec in Zambia. Male displays on ground with rapid wing-flicking, or flies in wide circles a few metres above ground while giving nasal calls and buzzing wing-snaps. Nest a small deep cup of coarse grass, lined with finer material, placed on ground between tufts of grass. Clutch 2-3 eggs; no further information.

Movements. Poorly understood. May be resident in some areas, an altitudinal migrant (in KwaZulu-Natal), a local migrant, or an intra-African migrant. Unpredictable locally, although patterns of occurrence seasonal in some areas; in tropics present during or near rains, mainly Sept-Mar at 4°-16° S and mainly May-Aug in C Africa; in South Africa, breeds on lower slopes of Drakensberg escarpment in austral summer, and found in winter along coast and on floodplains (as around L St Lucia). Birds seen near Beira (Mozambique) possibly migrants from E Zimbabwe highlands, but few records from latter area; also recorded on Limpopo floodplain.

Status and Conservation. Not globally threatened. Generally uncommon to frequent throughout most of range, may be more common locally; rare in South Africa, where population estimated at fewer than 3000 individuals. Disjunct distribution, and fragmented populations highly localized. Formerly recorded more widely in South Africa, but has probably disappeared from Gauteng and North-west Provinces, and range in S KwaZulu-Natal may also have descreased; possibly no longer survives in Lesotho; the species' elusive nature, however, makes this difficult to confirm. Habitat is under pressure from commercial afforestation, sugar-cane farming, overgrazing, agricultural intensification, unsympathetic fire regimes, and increasing and dense rural human populations. Opencast coal-mining has caused local losses.

Bibliography. Barnes (2000), Benson (1976), Benson *et al.* (1971), Borrow & Demey (2001), Brooke (1984b), Brown & Britton (1980), Campbell (1989), Chapin (1953), Clancey (1964b, 1969a, 1985b, 1985c, 1990a, 1996), Connor (1980), Davies *et al.* (2003), Dean (1971, 2000), Donnelly (1982), Dowsett (1989), Dowsett & Dowsett-Lemaire (1997), Ginn *et al.* (1989), Harrison *et al.* (1997), Hartman (1985), Keith *et al.* (1992), Lawson, P. (1980), Lawson, W.J. (1965b), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Mendelsohn *et al.* (1988), Milstein (1966, 2000), Newman (1996), Short *et al.* (1990), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Stevenson & Fanshawe (2002), Steyn (1996), Tarboton (2001), Tarboton *et al.* (1987), Vincent (1986), Voelker (1999a, 1999b, 1999c).

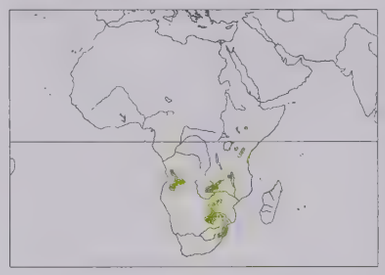
42. Bush Pipit

Anthus caffer

French: Pipit cafre **German**: Buschpieper **Spanish**: Bisbita Cafre
Other common names: Bushveld Pipit, Little Tawny Pipit

Taxonomy. *Anthus caffer* Sundevall, 1850, Mohapoani, by Limpopo River, South Africa.
May form a clade with *A. brachyurus* and *A. sokokensis*. Extent of distribution uncertain, and geographical variation and limits of races poorly understood. Birds from Angola included with *mzimbaensis* but smaller and less pale below, almost certainly involve an undescribed race; in addition, birds from extreme SE DRCongo and adjacent Zambia and N Malawi may represent an undescribed race; further study required. Five subspecies recognized.

Subspecies and Distribution.
A. c. australoabyssinicus Benson, 1942 - S Ethiopia (highlands E of Rift Valley).
A. c. blayneyi van Someren, 1919 - S Kenya and N Tanzania.
A. c. mzimbaensis Benson, 1955 - Angola (Cuanza Norte and Bié S to N Huíla, E to N Moxico), NW Malawi, extreme SE DRCongo and Zambia S to NE Botswana and C Zimbabwe.
A. c. caffer Sundevall, 1850 - SE Botswana, SW Zimbabwe, NE South Africa and W Swaziland.
A. c. traylori Clancey, 1964 - lowlands in NE South Africa (E Northern Province, NE KwaZulu-Natal), E Swaziland and extreme S Mozambique (S of R Limpopo).



Descriptive notes. 12·5-13·5 cm; 16-18 g. Small pipit with warm-coloured upperparts. Nominate race has indistinct buffish supercilium, buff-flecked dark brown lores and ear-coverts; warm reddish-brown upperparts are boldly streaked with dark brown, rump and uppertail-coverts only slightly streaked; wings dark brown, tertials and upperwing-coverts broadly edged and tipped warm buff; tail dark brown, outer rectrix white except at base of outer web; pale buff below, breast and flanks streaked dark brown; iris brown; upper mandible dark brown, lower mandible pale horn; legs light brown, hind claw short and curved. Distinguished from closely similar *A. brachyurus* by longer and broader tail, from *A. sokokensis* by darker and less boldly patterned underparts. Sexes alike. Immature is paler than adult, and more spotted above. Race *blayneyi* is more sandy buff than nominate, has rump streaked, belly whiter; *australoabyssinicus* is paler than last, has finer streaking above, streaks below extend to throat; *traylori* is smaller and less reddish above than nominate, rump more olivaceous and with dark brown streaks, underparts whiter; *mzimbaensis* resembles previous in colour but is much larger, but some Angolan birds smaller and less white below (also with less heavy streaking). Voice. Song, from tree perch, a repeated phrase of 2-3 notes, first note lower, "werrp-cheer, werrp-cheer, werrp-chirr" or "zweep-tseer, zweep-tseer, zweep-tseer". Call a sharp, sibilant "tzee-eep", "seeip", "tseeip" or "bzhzhzht", given when landing in a tree, or high nasal "meeh-tjih meeh-tjih" (first note rising); also a very distinctive, long descending "sseeeoo".

Habitat. Tree and bush savanna or open woodland with rather sparse ground cover, often with bare sandy patches or with scattered rocks and stones, from near sea-level to 2200 m. Recorded at edges of, or along, drainage lines in *Brachystegia* woodland, in acacia (*Acacia*) woodland, and in savanna, bushed and wooded grassland, and acacia thickets. In N Tanzania (Serengeti), appears to favour areas where grass cover between bushes reduced by heavy grazing by mammals. In SE Botswana, occurs in open woodland with wattles (*Peltophorum*) and acacias on lower slopes of rocky hills, heavily grazed and trampled by domestic livestock.

Food and Feeding. Prey consists of small insects and other invertebrates. Forages on the ground among leaves, in grass or on bare patches; when disturbed, flies jerkily up to top of a tree. Usually solitary or in pairs; occasionally in small loose flocks outside breeding season.

Breeding. Poorly known. Laying dates Mar-Apr in Kenya, Nov and Jan in Zimbabwe, and Oct-Mar in South Africa. Nest a small thick-walled grass cup, lined with rootlets, built on ground, concealed under tuft of grass. Clutch 2-3 eggs, mean 2·5 in South Africa, 2·7 in Kenya; no information on incubation and nestling periods.

Movements. Not well understood. Partially nomadic in E Africa (race *blayneyi*), movements coinciding with onset of rain; E populations of *mzimbaensis* undertake post-breeding movement to N Zambia, adjacent DRCongo and Malawi; *traylori* seems to be sedentary. Records in Zambia mainly in May-Sept dry season, suggesting that movements occur; in S Africa, however, present throughout year in all parts of range and reporting rates did not support concept of comprehensive migrations.

Status and Conservation. Not globally threatened. Localized and generally uncommon; not uncommon in Angola; very scarce in Malawi. Apparently disjunct distribution, but perhaps overlooked in some areas; possibly more widespread than currently realized. No evidence for any change in status over recent decades. Heavy grazing by domestic stock in some parts of its range may provide the sparse ground cover that this species prefers.

Bibliography. Aspinwall (1973, 1990), Aspinwall & Tucker (1971), Benson (1946a), Benson & Benson (1977), Britton (1980), Butler (1986), Campbell (1989), Chapin (1953), Clancey (1964b, 1989a, 1990a, 1991, 1996), Dean (1971, 1987, 2000), Ginn *et al.* (1989), Harrison *et al.* (1997), Hunter (1985), Irwin (1981), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1963), Maclean (1993a), Milstein (2000), Parker (1999), Penry (1994), Roberts (1913), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Stevenson & Fanshawe (2002), Stjernstedt (2004), Stronach (1990a), Tarboton (2001), Tarboton *et al.* (1987), Voelker (1999c), Wood (1993).

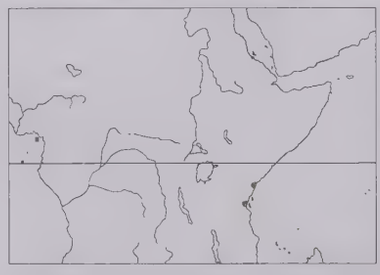
43. Sokoke Pipit

Anthus sokokensis

French: Pipit de Sokoke **German**: Sokokepieper **Spanish**: Bisbita del Sokoke

Taxonomy. *Anthus sokokensis* van Someren, 1921, Sokoke, Kenya.
May form a clade with *A. brachyurus* and *A. caffer*. Monotypic.

Distribution. Coastal forest in E Kenya and NE Tanzania.



Descriptive notes. 12 cm; 12-17 g. Small pipit with richly coloured upperparts, prominent pale wingbars, heavily streaked breast. Has narrow buffish-white supercilium, ear-coverts streaked pale buff and dark brown; broadly streaked warm buff and blackish-brown above, rump and uppertail-coverts tinged rufous; primaries and secondaries blackish-brown with narrow buff edges; tertials and inner greater wing-coverts dark brown, edges pale rufous or creamy buff (forming panel on closed wing); median coverts and outer greater coverts with broad buffish-white tips forming prominent wingbars; lesser coverts dark brown with broad buff fringes; tail feathers pointed, blackish-brown, central pair with broad rufous-buff edges, T5 tipped white, T6 white except for base of inner web; throat white; white with yellowish-buff tinge below, broad blackish streaks on upper breast, fine blackish streaks on lower breast, flanks and belly; underwing-coverts and axillaries white; iris dark brown; upper mandible blackish-horn, lower

mandible pinkish with brown tip; legs fleshy pink. Sexes alike. Immature unknown. Voice. Song, in flight, repeated high-pitched phrases e.g. "eee-see" or "su-eeee-see", middle note highest, each phrase separated by brief pause. Contact call, from tree or ground, high-pitched descending "sweer" or "tseer".

Habitat. Coastal forest. In Kenya (Arabuko-Sokoke Forest), particularly in dense *Afzelia*-dominated stands on white soil and in undisturbed *Brachystegia*-dominated woodland, also in degraded forest, and in *Cynometra-Manilkara* forest and lowland rainforest. In Tanzania (Kiono Forest), found in structurally uniform forest with 66% canopy cover, well-developed shrub layer, and sparsely vegetated ground with thick litter layer with much rotting wood and abundant terrestrial invertebrates; at Vikindu, also observed in a patch of forest with canopy cover 60-90%, very sparse shrub layer and almost no undergrowth.

Food and Feeding. Insects, such as termites (Isoptera) and beetles (Coleoptera). Forages among leaf litter on forest floor. When flushed, usually flies to high perch; sometimes may fly only short distance before dropping down to ground again.

Breeding. Undulating aerial display over forest canopy. No other information.

Movements. Resident.

Status and Conservation. ENDANGERED. Restricted-range species: present in East African Coastal Forests EBA. Global range very small, c. 2270 km². Shy and easily overlooked; often located only by its call. Recorded in seven or eight forests. Main stronghold in Arabuko-Sokoke Forest, in Kenya, where recent studies suggest population of 13,000 individuals, much higher than estimates made in 1970s and 1980s; densities up to 1 pair/2 ha in *Afzelia*-dominated forest, 2·8 birds/ha in undisturbed *Brachystegia* forest (but only 0·9/ha recorded in logged-over forest). Very rare at all known sites in Tanzania, and probably extinct at some. Has suffered greatly from degradation and loss of habitat; many coastal forests have disappeared or become severely degraded through logging, and through encroachment for crop-growing, stock grazing and firewood-gathering. Recent research indicates that continued presence of this pipit probably compatible only with very limited forest exploitation. Although an area of 400 km² of Arabuko-Sokoke has protected status, logging and replanting with exotic species remain legal activities; c. 43 km² fully protected, but legal regulations often ignored, and lack of funds for forest officers an added problem. In Tanzania, the species is the target of conservation efforts at Kiono and Vikindu Forest Reserves, although rare at both.

Bibliography. Bennun & Njoroge (1999), Bennun & Waiyaki (1992), Britton & Zimmerman (1979), Britton *et al.* (1984), Burgess, Cutts & Huxham (1991), Burgess, Huxham *et al.* (1991), Burgess, Mwasumbi *et al.* (1992), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Fanshawe (1991), Fishpool & Evans (2001), Green & Hirons (1991), Keith *et al.* (1992), Kelsey & Langton (1984), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Mlingwa (1991, 1993, 1996), Mlingwa *et al.* (1993), Moreau (1940b), Musila *et al.* (2001), Ripley & Bond (1971), Short *et al.* (1990), Stattersfield & Capper (2000), Stevenson & Fanshawe (2002), Turner (1977a), Waiyaki & Bennun (1999), Zimmerman *et al.* (1996).


inches
4
cm
10
44
45
46
ssp capensis
47
ssp colletti
48
49
50
51
52
53

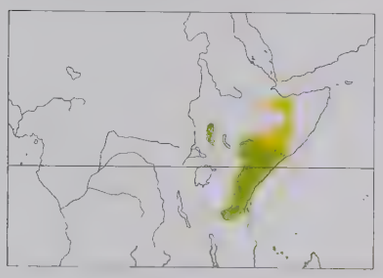
Genus *TMETOTHYLACUS* Cabanis, 1879

44. Golden Pipit

Tmetothylacus tenellus

French: Pipit doré **German**: Goldpieper **Spanish**: Bisbita Dorado

Taxonomy. *Macronix tenellus* Cabanis, 1878, Taita, south-east Kenya.
Apparently closely related to *Hemimacronyx* and *Macronyx*. Monotypic.
Distribution. SE Sudan and NE Uganda, and from NW Somalia and E & SE Ethiopia S to E Kenya and NE & C Tanzania.



Descriptive notes. 14-16 cm; male 18-21·5g, female 18-22 g. Distinctive motacillid with much yellow in wing and on side of tail; no feathering on lower tibia. Male unmistakable: has broad yellow supercilium, dusky-streaked greenish lores and ear-coverts; top and side of head, also mantle and scapulars, streaked blackish-brown and yellowish-green, back and rump yellowish-green with less streaking; primaries yellow, outer five blackish distally, inner four sometimes black-tipped; secondaries yellow; tertials dark brown with yellow base, tipped buff; alula and primary coverts yellowish, tipped black; outer greater and median wing-coverts yellow with dark brown bases of outer webs, inner greater and median coverts dark brown with buff fringes, lesser coverts dark brown, edged yellow; central tail feathers dark brown, next three pairs yellow, tipped and edged dark brown, outer two pairs yellow; below, bright golden-yellow, black breastband; underwing-coverts and axillaries yellow; iris and bill brown; legs pale brown, hind claw long and curved. Female has buff supercilium; above, is buffish-brown with dark brown streaks, rump less streaked; wings dark brown, primaries narrowly edged yellow, wing-coverts fringed buff; tail dark brown, outer rectrix yellowish-buff, adjacent one with yellowish-buff on inner web; buff below, yellower on centre of belly; underwing-coverts, axillaries and broad edges of inner webs of underside of primaries yellow. Immature resembles female, but breast spotted, young male with bases of secondaries yellow. Voice. Song, in flight or from perch, a series of sibilant or flute-like whistles, "dji-dji-dji-dji-dji-dur-dur" or "tsi-tsi-tsi-tsur-tsur-tsi-tsi-tsi-tsi"; also a grating hurried warbling, "tritt-ritthree-diderruh", as bird descends to ground from treetop.
Habitat. Arid light acacia (*Acacia*) bush, and scrubby grassland; sometimes in very open grassland with a few bushes in lowlands. Quite catholic in choice of habitats, being common in all savanna types, in SE Kenya (Tsavo East National Park). Generally below 1000 m, including coastal lowlands; occasionally to 1800 m.
Food and Feeding. Small insects, probably also other invertebrates. Forages in grassland; also takes items from herbage and bare ground. Frequently perches on bushes and trees and wags tail up and down in *Motacilla* fashion. Usually seen singly or in pairs; occasionally in presumed family parties, or in loose flocks outside breeding season.
Breeding. Lays in May in Ethiopia and Somalia; in Kenya, Jul on coast and Nov-Dec and Apr in SE; Nov in C Tanzania; mainly during rains, Dec-Jan, elsewhere. Monogamous; territorial. In song flight, male flutters upwards from treetop or bush, then glides to ground with wings raised in "V" over back. Nest is a cup of stems and grasses, lined with finer material, hidden low in a bush or just above ground in a grass tuft. Clutch 2-4 eggs; incubation and fledging periods not documented.
Movements. Rather poorly understood; probably migrates regularly between N and S of range, as indicated by birds caught at night at buildings in E Kenya, Nov to mid-Jan. Probably only a dry-season visitor in SE Sudan. In Somalia, present in NW mid-May to end Sept but not at other times, although a few birds remain in S, the rest presumed to have moved farther S, into Kenya; in 1961, S-directed passage noted in late Jun in N Somalia. In Kenya and Tanzania numbers fluctuate erratically, but present mainly Nov-Apr (during and after rains); at Mweka (N Tanzania) passes through in large numbers from Apr to Jun but few at other times; in Tsavo East National Park a definite increase occurs at onset of the rains, with peak numbers in Dec, then decrease through to Apr as grasslands dry out, and absent or nearly so in May-Sept. Few records of vagrants in South Africa and Zimbabwe, possibly result of extreme dispersal or occasional long-distance eruptions. Recorded once farther N, in S Arabia (Oman) in Jun.
Status and Conservation. Not globally threatened. Common in both NW & S Somalia, and locally common in Kenya and Tanzania; uncommon in S Sudan. In Tsavo National Park, in Kenya, reasonably high densities in bushed and wooded grassland, and lowest densities in open grassland and in woodland.
Bibliography. Archer & Godman (1937-1961), Ash & Miskell (1998), Backhurst & Pearson (1977), Bennun & Njoroge (1999), Benson (1946a, 1982), Briggs & van Zandbergen (2002), Brooke (1972b), Brooke & Irwin (1972), Brown & Britton (1980), Byaruhanga *et al.* (2001), Cave & Macdonald (1955), Clancey (1960b), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Friedmann (1937), Gallagher (1986), Ginn *et al.* (1989), Harrison *et al.* (1997), Jackson (1905), Keith *et al.* (1992), Lack (1985), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1963), Maclean (1993a), Newman (1996), Patten (1986), Schels & Lavoyer (1987), Short *et al.* (1990), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Stevenson & Fanshawe (2002), Stronach (1967), Turner (1977b), Zimmerman *et al.* (1996).

Genus *HEMIMACRONYX* Roberts, 1922

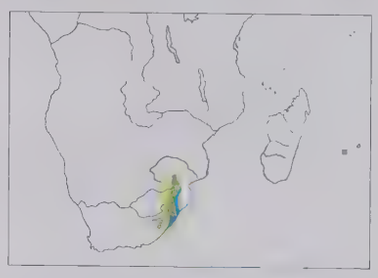
45. Yellow-breasted Pipit

Hemimacronyx chloris

French: Pipit à gorge jaune **German**: Gelbbrustpieper **Spanish**: Bisbita Pechigualdo

Other common names: Yellow(ish)-bellied Pipit, Yellow-breasted Longclaw

Taxonomy. *Anthus chloris* M. H. K. Lichtenstein, 1842, Eastern Cape, South Africa.
Genus apparently closely related to *Tmetothylacus* and *Macronyx*. Previously placed in genus *Anthus*, a treatment still preferred by some authors. Appears, however, much closer to *H. sharpei*, with which it probably forms a superspecies. Monotypic.
Distribution. Drakensberg in South Africa (Mpumalanga and W KwaZulu-Natal S to NE Eastern Cape and extreme SE Free State) and E & S Lesotho.



Descriptive notes. 16-18 cm; male 24-25·6 g, two females 25·3 g and 25·8 g. Unmistakable. In breeding plumage has narrow yellowish supercilium, with lores and ear-coverts streaked rich brown, whitish area below eye, thin blackish moustachial stripe; top of head and mantle blackish-brown, feathers edged yellowish-olive, giving effect of broad streaking; nape, rump and uppertail-coverts more grey; remiges and upperwing-coverts blackish-brown with narrow yellow, whitish or buff edgings; rectrices blackish-brown, edged buff, T5 tipped white on inner web, T6 almost entirely white; chin to upper belly bright yellow, brownish tinge on flanks, usually finely streaked brown on upper breast; lower belly to undertail-coverts greyish-white; greater underwing-coverts blackish with white tips, lesser underwing-coverts and axillaries yellow; iris dark brown; bill dark horn, yellowish base of lower mandible; legs yellowish-flesh, hind claw long and weak. In non-breeding plumage, lores and ear-coverts more uniform warm buffish-brown, moustachial stripe indistinct, feathers of upperparts edged warm buffish-brown, chin and throat pale buffish-brown, breast warm buffish and finely streaked brown, centre of belly yellow. Sexes alike. Immature is blackish-brown above, streaked creamy buff on head, scalloped on mantle and back, with tertials and upperwing-coverts broadly and sharply edged creamy buff, buff below, breast more dusky and finely streaked brown, belly centre slightly yellow-washed; resembles young *Macronyx capensis*, but has outer tail feathers white rather than white-tipped. Voice. Song, from perch or in flight, a repeated double "see-chick, see-chick", separated by brief pauses, the "see" note sibilant and soft, the "chick" abrupt and harsh. Call a single whistled "tseeu"; alarm a rapid continuous "chick chick chick".
Habitat. In breeding season restricted to areas of flat or undulating submontane grassland at 1400-2400 m; favours lush grassland with tussocks, and commonest in the least heavily grazed sites. In non-breeding period, also at lower elevations on grassland such as pastures and fallow land or in bush savanna.
Food and Feeding. Diet consists of insects, including mantids (Mantodea) and small beetles (Coleoptera). Skulking and furtive, creeping through grass and running across open spaces. Tends to freeze when approached, or to run, keeping behind cover; flushes at last minute and flies away for rather long distance; sometimes less shy. Usually in pairs; small flocks in non-breeding season.
Breeding. Breeds during Nov-Feb (summer rains). Monogamous; territorial, although sometimes several pairs nest close together. In aerial song display, climbs into air with floppy wingbeats, cruises for c. 100 m, then dives vertically into grass. Nest a cup of stalks, grass blades and rootlets, lined with fine rootlets and frequently also hair, built on ground under tussock or in grass clump. Clutch usually 3 eggs, mean of eight clutches 2·9; incubation and fledging periods not documented.
Movements. Resident and partial short-distance migrant. Some descend to lowlands in austral winter (Apr-Sept), a few moving E to Swaziland and coastal regions of KwaZulu-Natal and Eastern Cape; formerly recorded also in Vaal Basin W to North-east Province (W to Potchefstroom). An old record from S Western Cape (Swellendam).
Status and Conservation. VULNERABLE. Restricted-range species: present in South African Grasslands EBA. Localized and generally scarce within range; more common in N than in S. Rare in Lesotho, known only from Sehlabethebe National Park, where c. 60-80 pairs. Global population estimated at 1500-5000 individuals in 1992, but reassessed as between 2500 and 6500 in 2000. Occurs in Natal Drakensberg National Park; significant numbers, c. 30% of total population, occur in proposed grassland biosphere reserve in Wakkerstroom region of S Mpumalanga and adjacent KwaZulu-Natal. Has undergone range contraction and, probably, population decline as a result of habitat degradation and loss. Threats include overly frequent burning of grassland, and overgrazing and trampling by small livestock. There is a need to maintain low-intensity pastoral farming and to encourage appropriate management of grassland on private land; management practices affect nesting success through influencing the cover, height and density of vegetation; nest success highest in grassland with low-intensity grazing and biannual burning, lowest in heavily grazed, annually burnt plots; nest density, however, found to be highest in lightly grazed, annually burnt plots. Afforestation of montane grasslands an additional major threat, especially in N of range; has been estimated that 50% of the species' population could be lost through commercial afforestation on grasslands if no conservation action is taken.
Bibliography. Barnes (2000), Brooke (1984b), Campbell (1989), Clancey (1964b, 1985b, 1987a, 1990a), Colahan & Pringle (1998), Collar & Andrew (1988), Collar *et al.* (1994), Cooper (1985), Evans (2000a), Fishpool & Evans (2001), Ginn *et al.* (1989), Guy (1990), Harrison *et al.* (1997), Keith *et al.* (1992), Mackworth-Praed & Grant (1963), Maclean (1993a), McAllister (1994), Newman (1996), Osborne & Tiggar (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Stattersfield & Capper (2000), Tarboton (1997, 2001), Tarboton *et al.* (1987), Vernon (1983a), Voelker (1999c), Wilson (1999).

46. Sharpe's Longclaw

Hemimacronyx sharpei

French: Pipit de Sharpe **German**: Zitronenpieper **Spanish**: Bisbita de Sharpe
Other common names: Sharpe's Pipit

Taxonomy. *Macronyx sharpei* Jackson, 1904, Mau Plateau, Kenya.
Genus apparently closely related to *Tmetothylacus* and *Macronyx*. Species previously placed in latter genus, a treatment still preferred by some authors; others regard it as belonging in *Anthus*, on basis primarily of plumage pattern and size. Appears, however, much closer to *H. chloris*, with which it probably forms a superspecies. Monotypic.

On following pages: 47. Cape Longclaw (*Macronyx capensis*); 48. Yellow-throated Longclaw (*Macronyx croceus*); 49. Fülleborn's Longclaw (*Macronyx fuellebornii*); 50. Abyssinian Longclaw (*Macronyx flavicollis*); 51. Pangani Longclaw (*Macronyx aurantiigula*); 52. Rosy-breasted Longclaw (*Macronyx ameliae*); 53. Grimwood's Longclaw (*Macronyx grimwoodi*).

Distribution. Highlands of W & C Kenya: Mt Elgon, and on both sides of Rift Valley on Uasin Gishu, Mau and Kinangop Plateaux, S slopes of Aberdares and N slopes of Mt Kenya. Possibly also on Ugandan side of Mt Elgon.



Descriptive notes. 16-17 cm. Small, slender longclaw with *Anthus*-like appearance. Adult male has lemon-yellow supercilium with small olive-brown streaks, pale creamy lores tinged yellow, ear-coverts with cinnamon-brown wash; narrow dark olive-brown moustachial stripe with line of small dark spots below; above, brownish-black with distinct cinnamon to yellow-ochre edgings of feathers, pointed uppertail-coverts very long; remiges olive-brown with paler or brighter edges, tertials brownish-black with buff to cinnamon fringes; upperwing-coverts dark olive-brown, fringed yellow, creamy white or buff; rectrices dark olive-brown, central four pairs fringed buff, T4 tipped white, next pair with white distal third and pale yellow edging of proximal half of outer web, outer pair white with dark olive-brown shaft and proximal third of inner web; chin to centre of belly deep lemon-yellow, blackish streaks on breast, flanks cinnamon with brownish-black streaks, thighs, side of belly and undertail-coverts pale yellow to pale horn, streaked olive-brown; underwing pale olive-brown, axillaries deep lemon-yellow, underwing-coverts white; iris brown to dark brown; upper mandible pale brown to blackish, lower mandible paler with dark tip; legs horn, flesh-coloured, brownish or yellow-ochre. Female is duller than male, has supercilium yellowish-buff, underparts duller yellow, tinged pale buff on breast, duller white on tail. Immature is paler above than adult, upperwing-coverts fringed whitish, buff supercilium, dull creamy whitish below, washed yellow on lower breast and centre of belly, breast heavily spotted olive-brown. Voice. Song, in flight or from perch, a series of thin, plaintive whistles rising in pitch, "yo yo teu-tee", "tyo tyo tew-tee", "tew tyo tew tee" or "yoo si-si-si-si", or more complex series of notes, e.g. "tee s-si ya yee yo-yo". Calls include high-pitched "tsip" or "tsit" in flight; also sharper "tswit", more plaintive "tweeeee", richer rising "yooee" or descending "seeoo", and thin "eeeu".

Habitat. Open, treeless, short and often tussocky grassland at 1850-3400 m, mostly below 2800 m; areas favoured may be moist, waterlogged or dry, depending on rainfall. On Kinangop Plateau, it was found to prefer short grass with tussocks rather than open short grass or long grass, and avoided non-grassland areas entirely. Occurs mostly at higher altitudes than *Macronyx croceus*, with little overlap between the two.

Food and Feeding. Insects, particularly grasshoppers (Orthoptera) and beetles (Coleoptera), also other small invertebrates. Forages in grassland; foraging range and rate of pecking for food items are higher in grass with tussocks than in other grassland habitats. Found singly, in pairs, or in family parties or groups of up to seven individuals.

Breeding. Laying during or just after rains, Mar-Jun and Sept-Oct, and in Dec. Monogamous; solitary nester, territorial. In brief aerial display, flies up from ground, sings more rapidly during descent. Nest a deep, well-constructed cup of dry grass, lined with rootlets, well hidden at base of grass tussock or herbaceous plant, in grass under small bush or under clod of earth, sometimes in excavated hollow. Clutch 2-3 eggs, mean 2·2; incubation and fledging periods not documented; injury-feigning display by adult with young in nest has been described.

Movements. Sedentary; local movements may occur if habitat becomes very dry.

Status and Conservation. ENDANGERED. Restricted-range species: present in Kenyan Mountains EBA. Local and generally uncommon; in 1977 described as common on Kinangop and Mau Plateaux and around Nyahururu. Total range covers c. 2100 km², and global population thought to be greater than 10,000 individuals; great majority of population found on private land, outside protected areas. Mean home-range size 0·5 ha. Land-use changes, especially cultivation of grassland, planting of trees, and ploughing to remove tussock species, pose a serious threat; habitat loss has led to contraction of this species' range and decline in its numbers. Preservation and protection of suitable habitat considered essential in order to ensure its future survival.

Bibliography. Bennun (1999), Bennun & Njoroge (1999), Brown & Britton (1980), Clancey (1990a), Collar *et al.* (1994), Cooper (1985), Fishpool & Evans (2001), Keith *et al.* (1992), Lens, Bennun & Duchateau (2001), Lens, Duchateau & Bennun (1996), Lens, Muchai *et al.* (2000), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Muchai (1998, 2001), Muchai, Bennun & Lens (1998, 2001), Muchai, Bennun, Lens *et al.* (2002), Muchai, Lens & Bennun (2002), Muchane *et al.* (1996), Ndagn'ang'a, Mulwa & Gichuki (2003), Ndagn'ang'a, du Plessis *et al.* (2002), Short *et al.* (1990), Stattersfield & Capper (2000), Stevenson & Fanshawe (2002), Turner (1977a), Zimmerman *et al.* (1996).

Genus *MACRONYX* Swainson, 1827

47. **Cape Longclaw**

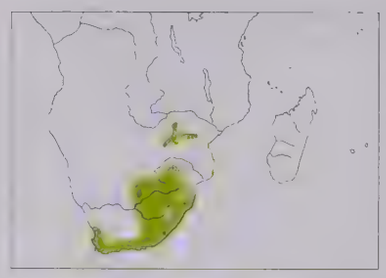
Macronyx capensis

French: Sentinelle du Cap **German**: Kappieper **Spanish**: Bisbita de El Cabo
Other common names: Orange-throated Longclaw

Taxonomy. *Alauda capensis* Linnaeus, 1766, Cape of Good Hope, South Africa.
Genus probably closely related to *Tmetothylacus* and *Hemimacronyx*. Races *stabilior* and *colletti* merged by some authors. Proposed race *latimerae* (Eastern Cape) included within *colletti*. Three subspecies currently recognized.

Subspecies and Distribution.
M. c. stabilior Clancey, 1952 - Zimbabwe (C plateau E to Inyanga Mts) and adjacent Mozambique.
M. c. colletti Schou, 1908 - extreme SE Botswana, E South Africa (Northern and C North-west Provinces S to N Eastern Cape), Swaziland and Lesotho.
M. c. capensis (Linnaeus, 1766) - coastal belt of SW & S South Africa.

Descriptive notes. 20-21 cm; male 49·2-55 g, female 45·2-52·2 g, unsexed 40-55 g. Large, chunky, short-tailed longclaw with reddish to orange throat, upright stance. Adult male nominate race has bright orange supercilium, white or pale yellow lores and line below eye, greyish-horn to dull cinnamon ear-coverts; forehead to mantle and scapulars dark olive-brown, pale feather fringes forming greyish (sometimes cinnamon) collar, back to uppertail-coverts greyish-horn to dull cinnamon; remiges dark olive-brown, edged orange-yellow, outer primary edged cream, secondaries tipped buff, tertials fringed buff to dull cinnamon; upperwing-coverts dark olive, fringed orange, orange-



yellow or cinnamon; rectrices dark olive-brown, central pair with narrow buff fringes, remainder with white at tip (becoming progressively greater towards outer pair) and with outer webs narrowly edged pale yellow to pale orange, outer pair with white outer web except at base; chin, throat, malar region and foreneck bright deep orange, bordered by brownish-black necklace, latter broadening in centre; centre of breast and belly orange-yellow, breast side (sometimes entire breast), flanks, thighs and undertail-coverts cinnamon to cinnamon-brown, breast side usually obscurely streaked olive-brown to buff-brown; underwing pale olive-brown, axillaries white, edged bright orange; iris hazel to dark brown; bill brown to blackish, greyish base of lower mandible; legs light brown, tinged flesh, reddish or yellow. Adult female is duller, has necklace browner and less well defined, breast and side of belly more greyish-horn to dull cinnamon. Juvenile has less orange-yellow below, narrower necklace; immature male has paler hindneck, darker feather centres above, pale cinnamon to creamy fringes forming bolder pattern on wing, throat patch creamy to orange, incomplete necklace, pale and duller orange-yellow centre of lower breast and belly, rest of underparts washed dull cinnamon to dark grey; immature female is paler below than young male. Race *colletti* is paler and brighter below than nominate, centre of breast and belly orange-yellow, breast side, flanks and thigh cinnamon to tawny-olive, sometimes pale grey on thigh and undertail-coverts; *stabilior* differs from previous in well-developed black feather centres on upperparts, is more rufous and less grey above, darker wings and tail, duller below, male has pronounced brownish suffusion on breast side. Voice. Song, in flight, a series of clear, piping, far-carrying "dweet" or "deweet" whistles, sometimes with added "meew", e.g. as "deweet, meew, deweet, meew". Calls include a series of clear, piping, far-carrying whistles "dweet" or "deweet", sometimes with an added "meew" rendered as "deweet, meew, deweet, meew". Calls include whistled "tsweet" from ground or in flight, also cat-like "meew" as alarm; also, harsh "chack", chirping "chi-rup" or "cheeerr-up", loud "choi", "chio", "chi-cho", "choik" and similar notes, often run together and given with other calls. May occasionally mimic other species.

Habitat. Favours short, usually dry, grassland in cool climates, but in some areas moist grassland, often near vleis and dams. In N occurs on montane grassland on highveld plateaux to c. 2300 m; in S on grasslands at lower altitudes, to sea-level in E & S South Africa. Also on pasture, fallow or cultivated land, and in extreme S on rocky seashores and in low fynbos. Often attracted to recently burnt ground, especially in non-breeding season. May occur alongside *M. ameliae* and *M. croceus* in parts of Zimbabwe and KwaZulu-Natal; occupies drier grassland than former, and found in areas with fewer intruding trees and bushes than those preferred by latter.

Food and Feeding. Food includes wide range of insects, both adults and larvae; also some grass seeds (Gramineae). Stomachs contained grasshoppers (Acrididae), beetles (Coleoptera) and stink-bugs (Pentatomidae). Other prey include termites (Isoptera), reduviid bugs (Hemiptera), and dipteran flies, including hippoboscids. Forages on ground in grassland, also on burnt ground; also in intertidal zone in S Cape region. Picks invertebrates from the ground; follows ploughs and associates with domestic stock, picking up disturbed insects. Uses its feet to scratch open termite tunnels. Chases moving insects; also catches them, notably termite alates, in the air, hawking out from a bush or small tree. Forages singly, in pairs or in small loose groups.

Breeding. Sept-Mar, mostly Nov-Feb, in Zimbabwe, and from Sept in Mozambique; in South Africa, Aug-Apr (mainly Nov-Jan) in N & E, and Jul-Dec (peak Aug-Sept) in SW. Monogamous; territorial. In display-flight, male rises to c. 10 m, sings while fluttering wings, drops back to ground. Nest a deep cup of grass, lined with finer grass and rootlets, built on ground close to or within grass tussock or well hidden in other dense vegetation cover. Clutch 2-5 eggs, mean 3; incubation and fledging periods not recorded.

Movements. Resident; some post-breeding altitudinal movements.

Status and Conservation. Not globally threatened. Fairly common throughout much of range; less abundant in Lesotho than in adjacent low-lying areas. Uncommon in lowlands and midlands of KwaZulu-Natal, where *M. croceus* is common. No evidence of any change in range or status in recent years, although at edges of its range, as in SE Botswana, contractions occur in some years.

Bibliography. Arnade (1981), Bowland (1984), Choate (1975), Clancey (1952c, 1959b, 1964b, 1968b, 1980, 1996), Cooper (1985), Dean (1987), Ginn *et al.* (1989), Gottschalk (1982, 1985), Harrison *et al.* (1997), Hewitt (1962), Hockey *et al.* (1989), Hunter (1985), Irwin (1981), Keith *et al.* (1992), Kopij *et al.* (2002), Langley (1973), Mackworth-Praed & Grant (1963), Maclean (1993a), Maclean & Prys-Jones (1988), Parker (1999), Parker & de Boer (2000), Pedersen (2000), Penry (1994), Rens (1999), Roberts (1913), Rowse (1996), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Swynnerton (1911), Tarboton (2001), Tarboton *et al.* (1987), Turner (1962), Voelker (1999a, 1999c).

48. **Yellow-throated Longclaw**

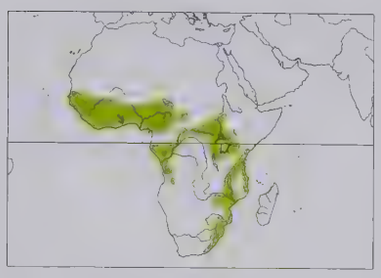
Macronyx croceus

French: Sentinelle à gorge jaune **German**: Gelbkehlpieper **Spanish**: Bisbita Gorgigualdo

Taxonomy. *Alauda crocea* Vieillot, 1816, Java; error = Senegal.
Genus probably closely related to *Tmetothylacus* and *Hemimacronyx*. May form a superspecies with *M. fuellebornii*. Plumage individually variable, and recognition of races often considered unwarranted; proposed race *hygricus* (Upper Guinea) included in nominate. Race *vulturnus* sometimes misspelt *vulturinus*. Three subspecies tentatively recognized.

Subspecies and Distribution.
M. c. croceus (Vieillot, 1816) - Senegambia E to Cameroon, W & S fringes of Chad, N & S Central African Republic, Gabon, NW & WC Angola, PRCongo, W, N & NE DRCongo, S Sudan, and Uganda and mesic areas of W & C Kenya S to Burundi and NW & N Tanzania (S to the Serengeti).
M. c. tertius Clancey, 1958 - coastal lowlands of Kenya and Tanzania.
M. c. vulturnus Friedmann, 1930 - C & S Tanzania, E Zambia (E of Luangwa Valley), Malawi, NE & C Zimbabwe and Mozambique S to SE South Africa.

Descriptive notes. 20-22 cm; male 43·8-57 g, female 43-51·6 g. Large, distinctive longclaw. Adult male nominate race has deep lemon-yellow supercilium, white area under eye, brown ear-coverts; olive-brown above, pale feather edges giving heavily streaked appearance, paler on neck, rump and uppertail-coverts, darker on scapulars and mantle; remiges and upperwing-coverts dark olive-brown with pale edges; rectrices dark olive-brown with pale shafts and fringes, T3 with distal quarter of inner web white, outer web white with narrow buff to pale yellow fringe, T4 similar but distal third of inner web white, T5 with distal half white, T6 with distal half white and outer web whitish with lemon-yellow edge; chin, throat, malar region and foreneck deep lemon-yellow, completely bordered by blackish band that broadens in centre of breast; rest of underparts deep lemon-



yellow, washed cream or buff, with variable amount of dull dark brown streaking; axillaries pale yellow, underwing-coverts white; iris brown, sometimes black, grey-brown or steel-blue; upper mandible brown to blackish, lower mandible grey, pale blue or, rarely, slate-green, sometimes tipped dark; legs pale brown to dull yellow, sometimes tinged flesh, straw or greenish, hind claw very long and curved. Female is duller than male, underparts often with buff or olive-yellow wash, necklace less well defined, usually narrower and dull dark olive-brown. Immature male is duller than adult, with darker fringes of upperpart feathers, yellow areas duller, washed with buff or olive-yellow, ill-defined broken necklace dark olive-brown, streaking below olive-brown and more extensive pale areas on tail duller, central rectrix with broad dull cinnamon fringe; immature female duller than young male, supercilium mainly dull buff, necklace of paler brown spots and streaks. Race *vulturnus* has longer bill than nominate, upperparts light greyish-brown with umber feather centres, throat, breast and abdomen lemon-chrome, flanks greyish-buff; *tertius* is greyer above than previous, lighter and clearer yellow below, bill shorter. Voice. Typical song, from perch or in flight, a rapid "tir-tri-tri-tri", the "tri" repeated up to c. 12 times, regionally variable, often preceded by whistled call notes. Commonest call a monotonous "tuewhee", "twee-eu", "meeeh" or "tsrrry", from top of bush or in flight; various multiple calls, e.g. descending far-carrying "te-ter-to" with last 2 notes repeated many times, whistled "torry teer-teer-eer-teer" with "teer" repeated, and "tirreeoo, trip-tritri"; also "tyoo-eoo", "tyo-éééoo" and variants, "twee-ee" and others; loud piping alarm "twip pipipipipipi" and hard "ker kwee-kwee-kwee" or rapid "keer keer keer".

Habitat. Dry grassland and cultivated open areas, scrubby grassland away from water, open clearings in miombo woodland (Zimbabwe) and in forest (W Africa), also airfields; also drier edges of wet grassland and swamps, as in S Sudan. Favours habitats having low trees and bushes for perches. To 1600 m in Zimbabwe, to 2350 m in Kenya; in South Africa occurs from sea-level to c. 900 m. In Kenya shares habitat (bushed and wooded grassland and ponds near Mombasa) with *M. aurantiigula*, but far more numerous than latter; found mostly at lower altitudes than *Hemimacronyx sharpei*. In Zimbabwe and NE South Africa (KwaZulu-Natal) occurs alongside *M. capensis* and *M. ameliae*, but different habitat preferences then evident.

Food and Feeding. Insects and other invertebrates, notably grasshopper adults and nymphs (Orthoptera), adult and larval beetles (Coleoptera) and moths (Lepidoptera), as well as mantids (Mantodea), ants (Hymenoptera), millipedes (Diplopoda), snails (Mollusca); also some plant material. Forages on ground. Usually in pairs or family parties.

Breeding. Mainly during or just after rains, mainly May-Aug in W Africa, also Dec in Senegambia, Apr-Oct in Nigeria; Oct in Sudan; in all months but mostly during rains in Kenya, Mar-Nov (mostly in rains) in Uganda, Nov-Jun in Tanzania, Aug-Nov in DRCongo, Jun and Dec in Zambia, Nov-Apr in Malawi, Nov-May in Mozambique; Sept-Mar (before and during rains) in Zimbabwe, and in South Africa Aug-Apr (mostly Nov-Jan) in N and Oct-Feb in KwaZulu-Natal. Monogamous; territorial. Fluttering display-flight, with tail spread. Nest built by female, male in attendance, usually a deep cup of grass with lining of fine rootlets and fibres, well concealed under grass clump or against bush. Clutch 2-4 eggs, average 3; incubation mostly or solely by female, period 13-14 days; chicks fed by both parents, nestling period 16-17 days; fledgings attended by both sexes for up to 7 weeks or more.

Movements. Probably resident in many areas. Local seasonal movements noted in Sudan, Malawi and parts of South Africa; during survey work in S Africa, local variation in numbers from year to year also suggested some movement.

Status and Conservation. Not globally threatened. Widespread and not uncommon in suitable habitat through much of range, locally less common; scarce in Senegambia and rare in Mali. Common in several large protected areas, e.g. Serengeti National Park, in Tanzania. One old record from SE coast of Somalia, in 19th century; probably a wanderer from coastal Kenya. No imminent threats identified; could possibly become threatened locally if severe loss of habitat occurs.

Bibliography. Ash & Miskell (1998), Bannerman (1953), Barlow *et al.* (1997), Beesley (1972), Benson & Benson (1977), Benson *et al.* (1971), Carroll (1988), Cave & Macdonald (1955), Cheke & Walsh (1996), Christy & Clarke (1994), Clancey (1964b, 1968b, 1984e), Dean (2000), Demey & Fishpool (1994), Dowsett & Dowsett-Lemaire (1991, 1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Evans & Balmford (1992), Farmer (1979), Gatter (1997), Ginn *et al.* (1989), Giraudoux *et al.* (1988), Gore (1990), Green (1983), Grimes (1987), Harrison *et al.* (1997), Hickling (1983), Hodgson (1971), Irwin (1981), Keith *et al.* (1992), Koster & Grettenberger (1983), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Masterson & Child (1959), Medland (1992c), Nikolaus (1987), Parker (1999), van Perlo (1995), Rodwell (1996), Ryall (1991), Salewski (2000), Savalli (1991), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Stevenson & Fanshawe (2002), Steyn (1996), Tarboton (2001), Thiollay (1985), Voelker (1999c), Wilkinson & Beecroft (1988), Zimmerman *et al.* (1996).

49. Fülleborn's Longclaw

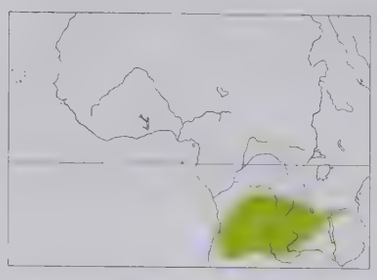
Macronyx fuellebornii

French: Sentinelle de Fülleborn **German**: Fülleborn pieper **Spanish**: Bisbita de Fülleborn

Taxonomy. *Macronyx füllebornii* Reichenow, 1900, Unika Highlands, south-western Tanzania.
Genus probably closely related to *Tmetothylacus* and *Hemimacronyx*. May form a superspecies with *M. croceus*. Two subspecies recognized.

Subspecies and Distribution.
M. f. ascensi Salvadori, 1907 - Angola, C & S DRCongo, Zambia (W of Luangwa Valley) and extreme N Namibia; probably also extreme N Malawi.
M. f. fuellebornii Reichenow, 1900 - SW Tanzania.

Descriptive notes. 20 cm; male 53-64 g, female 46-60 g. Large, distinctive longclaw. Adult male has deep lemon-yellow supercilium, white to buff lores, cinnamon-brown ear-coverts; white or buffish-white line from lores to side of neck, sometimes to breast side; forehead to nape very dark olive-brown to brownish-black with slight scaled appearance, greyish collar; upperparts dark olive-brown to brownish-black, except for greyish back and rump sometimes tinged cinnamon; wings dark olive-brown to brownish-black, fringed bright yellow or yellowish-white to buff or greyish-horn; rectrices dark olive-brown, all except central pair tipped white, white area increasing in size towards outer feather, which has distal third white; chin, throat, malar region and foreneck deep lemon-yellow, bordered by blackish necklace from moustachial region downwards and across upper breast, where broadens in centre; rest of underparts dull lemon-yellow to buff, breast sometimes finely streaked dark; underwing pale olive-brown, axillaries white or yellowish-white; iris dark brown; upper mandible dark horn to black, lower mandible greyish or horn, tipped blackish; legs horn-coloured or brown, tinged yellowish, hind claw long and curved. Distinguished from similar *M. croceus* by having underparts suffused with buff, no streaking on side of breastband, less pronounced yellow supercilium, buff-brown flanks and undertail-coverts. Adult female has browner and narrower necklace. Immature is darker and duller above, duller and buffer below, necklace browner and narrower. Race *ascensi* is slightly larger than nominate, and has duller, less cinnamon rump. Voice. Song "tu-wee-ti-choo wee-ti-choo"; monotonous whistled "jee-o-wee", when perched or in flight; other recorded calls include mournful "peeeu", metallic "weee" or "wieh wrrit" and chirping "chwee".



Habitat. Moist highland grassland, wet plains and dambos, drainage lines in woodland, also dry grassland if near water, including near sewage-treatment works; occurs even in small areas of grassland, often with scattered trees and bushes. At 730-2450 m. Where overlaps in range with *M. ameliae* and *M. grimwoodi*, as in NW Zambia, occupies drier ground than those species.

Food and Feeding. Insects, notably grasshoppers (Orthoptera) and beetles (Coleoptera); also spiders (Araneae). Forages on the ground; also catches termite alates (Isoptera) in flight. Occurs in pairs and family parties.

Breeding. Laying mainly during rains, Sept-Feb in most of range, but also in May in DRCongo, and occasionally Jun in Zambia; Nov-May in Tanzania. Monogamous; territorial. Nest a shallow, wide, neat cup of grass, lined with finer grass and rootlets, on ground close to or within grass tussock. Clutch 2-3 eggs, mean 2·7; incubation and fledging periods not recorded; nestlings fed by both parents; injury-feigning display observed when adult flushed from nestlings.

Movements. Resident; local seasonal movements, moving from drier grasslands to damper habitats in May-Sept. Nominate race recorded once in N Tanzania (Mbulu), far to NE of normal range.

Status and Conservation. Not globally threatened. Widespread and fairly common in Angola; common in highlands of Tanzania. Drainage of dambos and other wetlands may be a threat locally.

Bibliography. Anon. (1993), Aspinwall & Beel (1998), Benson, Brooke *et al.* (1971), Benson, Irwin & White (1959), Britton (1970), Brown & Britton (1980), Cooper (1985), Dean (2000), Dowsett & Dowsett-Lemaire (1978, 1997), Fishpool & Evans (2001), Keith *et al.* (1992), Lippens & Wille (1976), Lynes (1934), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Newman (1996), Pedersen (2000), Rudebeck (1955), Short *et al.* (1990), Stevenson & Fanshawe (2002), Taylor (1983), Tree (1962).

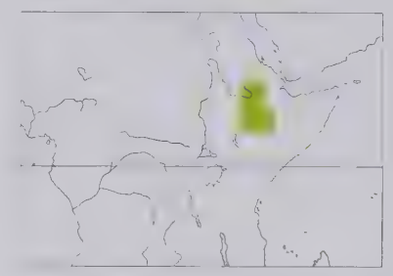
50. Abyssinian Longclaw

Macronyx flavicollis

French: Sentinelle d'Abyssinie **German**: Goldhalspieper **Spanish**: Bisbita Abisinio
Other common names: Ethiopian Longclaw

Taxonomy. *Macronyx flavicollis* Rüppell, 1840, Simien Mountains, north Ethiopia.
Genus probably closely related to *Tmetothylacus* and *Hemimacronyx*. Monotypic.

Distribution. Mountains of N, C & SW Ethiopia



Descriptive notes. 20 cm. Adult male has saffron-yellow supercilium, paler and more buff to creamy behind eye, broad olive-brown eyestripe, buff to creamy ear-coverts; side of neck buff to cream; brownish-black above, paler on back, rump and uppertail-coverts, broad buff to cinnamon feather edgings producing striped appearance; primaries and secondaries olive-brown with pale or bright edgings, upperwing-coverts brownish-black, edged white, yellow, buff and cinnamon; rectrices dark olive-brown, all except outermost edged buff, T3 with small white tip, T4 with distal quarter of inner web and tip of outer web white, T5 with distal third of inner web and tip of outer web white, outermost rectrix with distal half of inner web and most of outer web white; chin, throat, malar region and foreneck deep saffron-yellow to orange-yellow, bordered by dark olive-brown moustachial stripe that joins blackish necklace of varying width, broader in centre; rest of underparts buff to cinnamon, paler on flanks and thighs, blackish-brown streaks on breast side, yellow wash on centre of belly; underside of remiges pale olive-brown with cinnamon tinge, axillaries white, underwing-coverts whitish with darker centres; iris dark brown; upper mandible black to grey, lower mandible grey; legs brown with flesh-coloured or yellow tinge, hind claw very long and curved. Adult female is paler and duller below than male. Immature has chin to neck buff or cinnamon, moustachial stripe browner, necklace browner and consisting of spots. Voice. Song, from perch or on the wing, a clear trill; has a piping call.

Habitat. Open grassland on high mountain plateaux; 1200 m to above 3000 m, mainly 1800-2750 m.

Food and Feeding. Insects and other invertebrates; no details of diet. Forages on the ground in grassland, by picking items from surface.

Breeding. Mainly Jun-Aug, occasionally in Feb. Nest a grass cup lined with fibre or horsehair, built on ground among young crops or in grass. Clutch 2-3 eggs. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Uncommon. Was considered abundant but local in 1950s and 1960s, and common and widespread from 1966 to 1977, but fewer were found in 1989; described as uncommon by ornithologists surveying Important Bird Areas during 1990s. Numbers may have been reduced through an expansion in area of cultivated land, and consequent increases in grazing pressure on remaining grassland, as a result of growth in human population.

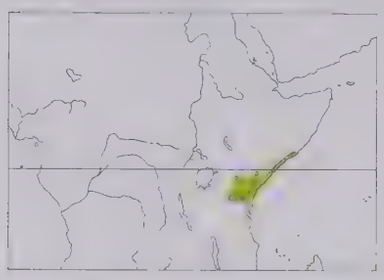
Bibliography. Ash & Gullick (1989), Benson (1946a), Collar *et al.* (1994), Cooper (1985), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Francis & Shirihai (1999), Keith *et al.* (1992), Mackworth-Praed & Grant (1960), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Tilahun *et al.* (1996), Urban (1980), Urban & Brown (1971).

51. Pangani Longclaw

Macronyx aurantiigula

French: Sentinelle dorée **German**: Panganipieper **Spanish**: Bisbita de Pangani

Taxonomy. *Macronyx aurantiigula* Reichenow 1891, Pangani River, east Tanzania.
Genus probably closely related to *Tmetothylacus* and *Hemimacronyx*. May form a superspecies with *M. ameliae*. Birds from S Kenya sometimes separated as race *subocularis*. Monotypic.
Distribution. SE Somalia, SE Kenya (S on coast to Mombasa) and NE Tanzania (Arusha, W Tanga).



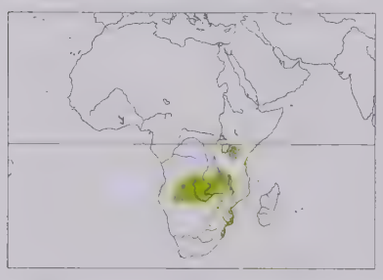
Descriptive notes. 19-20 cm; 36·6-43 g. Male has orange-yellow supercilium to above eye, white behind eye, cinnamon-brown ear-coverts; above, dark olive-brown to brownish-black with pale feather edges, giving scaly effect; wings olive-brown, outer edges of primaries fringed pale yellow, other feathers fringed buff; tail feathers dark olive-brown, central pair fringed buffish, rest with pale buff fringes and white tip, amount of white progressively increasing outwards, outermost rectrix mostly white with buff tinge; chin, malar region, throat and foreneck orange-yellow or deep yellow, entirely bordered by blackish moustachial stripe and necklace; breast side buff, centre of breast and belly, and sometimes thighs, deep yellow, belly side and undertail-coverts white to whitish-buff, brownish-black streaking on breast and flanks, olive-brown streaks on undertail-coverts; axillaries white; iris darkish brown; bill brown to black, lower mandible paler with dark tip; legs pale brown, tinged flesh. Distinguished from very similar *M. croceus* mainly by smaller size, more orange throat patch, narrower breastband, less extensive yellow below, more streaking below. Female has supercilium less yellow, is paler yellow below, necklace narrower. Immature is mainly buffish below, some yellow on breast, breastband broken and poorly defined. Voice. Song, from perch, a rapidly repeated descending "teeoo", or "syeet syeet syeet, churrie churrie which which which-which, tee-er, ee-er, tee-ur", each note repeated two or more times. Various calls given when perched or in flight, e.g. repeated high-pitched, plaintive "seeeeeee", repeated rising whistled "weee" or "ooeee" and rapid, chirping but musical "chrry"; anxiety call a plaintive "k-lee", given in flight during breeding season.
Habitat. Dry grassland with acacia trees (*Acacia*) and bushes, and coastal grassland; also on higher, moister grassland in NE Tanzania; open areas and light woodland in Somalia. Not associated with water. Generally below 1000 m; up to 1800 m in NE Tanzania. Slight overlap with *M. ameliae* on Ardai Plains, in Tanzania; also occurs together with *M. croceus* in coastal Kenya, both in parkland along lower R Tana and in acacia bush near Mombasa.
Food and Feeding. Prey includes insects, notably beetles (Coleoptera), grasshoppers (Orthoptera), termites (Isoptera), and small moths and their larvae (Lepidoptera); also spiders (Araneae) and snails (Mollusca). Forages mainly on the ground, but may snatch insects 1 m up in the air. Usually singly, in pairs or in trios.
Breeding. In all months except Aug and Oct in Kenya and Tanzania. Monogamous; solitary nester. Nest built by female, with male in attendance, a cup of dry grass, lined with fine rootlets and fibres, placed on ground in dense grass, or above ground in grass tussock with approach ramp. Clutch 2-4 eggs, mean 2·5; incubation, probably by female alone, 13 days; chicks fed by both parents, fledging period not documented; distraction display by male recorded.
Movements. Presumed resident in Somalia. Probably some local movements in Kenya; has been noted as absent from grassland near Mombasa in dry season (Jan-Apr), whereas it was found to be more common in Tsavo East National Park in wet season.
Status and Conservation. Not globally threatened. Uncommon in Somalia, occurring in narrow strip within 100 km of SE coast. Common in Kenya, where fairly common through year in Tsavo East National Park in areas with high grass cover. Recorded densities of 11 individuals/10 ha in grassland, 4 in bushed grassland, 2 in wooded bushed grassland and 2 in bushland; 2 birds/10 ha in riverine habitats. Locally common, and present in several protected areas, in Tanzania.
Bibliography. Ash & Miskell (1998), Beesley (1973), Bennun & Njoroge (1999), Britton (1980), Brown & Britton (1980), Cooper (1985), Fishpool & Evans (2001), Fuggles-Couchman (1984a, 1984b), Irwin (1957), Keith *et al.* (1992), Lack (1985, 1986), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Pearson (1983), van Perlo (1995), Pierce *et al.* (1977), Ryall (1991), Short *et al.* (1990), Stevenson & Fanshawe (2002), Wood (1988), Zimmerman *et al.* (1996).

52. Rosy-breasted Longclaw

Macronyx ameliae

French: Sentinelle à gorge rose **German**: Rubinkehlpieper **Spanish**: Bisbita Gorgirrosa
Other common names: Pink-throated/Rosy-throated Longclaw

Taxonomy. *Macronyx ameliae* de Tarragon, 1845, Durban, South Africa.
Genus probably closely related to *Tmetothylacus* and *Hemimacronyx*. May form a superspecies with *M. aurantiigula*. Validity of geographical races doubted by some authors, who prefer to treat species as monotypic. Three subspecies tentatively recognized.
Subspecies and Distribution.
M. a. wintoni Sharpe, 1891 - C & SW Kenya (C highlands, L Victoria basin, and Masai Mara) and N Tanzania (S to Serengeti and Ngorongoro Crater, E to L Manyara and Ardai and Sanya Plains).
M. a. altanus Clancey, 1966 - E & S Angola (E plateau), SE DRCongo and extreme SW Tanzania S to NE Namibia, N Botswana (Okavango Delta, Linyanti Swamp and Chobe floodplain), extreme NW Mozambique and extreme N & C Malawi (R Songwe mouth, and Lilongwe area); also on highveld of NE & C Zimbabwe.
M. a. ameliae de Tarragon, 1845 - coastal S Mozambique and NE South Africa (KwaZulu-Natal coast S to L St Lucia).



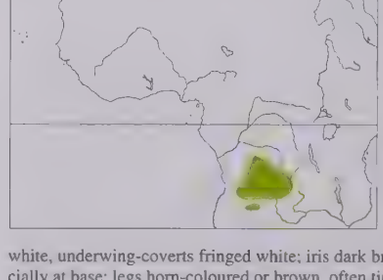
Descriptive notes. 19-20 cm; male 30·3-39·8 g, female 30·8-34 g. Distinctive, slender, long-tailed longclaw with pink throat. Male has whitish to buff supercilium, pinkish in front of eye, buffish-white lores and cheeks, cinnamon-brown ear-coverts; blackish above, feathers edged cinnamon, buff or whitish, neck side pale cinnamon with dark olive-brown streaking; wings olive-brown, remiges edged whitish, pinkish or buff, coverts variously edged pink, red, orange, white and buff; tail dark olive-brown, central four feather pairs edged buff to white, T4 with small white tip, T5 with distal third or more white, outermost rectrix mostly white; chin, malar area, throat and foreneck orange, pink or red, bordered by blackish moustachial stripe that meets blackish necklace on upper breast, breastband broadest in centre; breast side buff or whitish with blackish streaking, lower breast and belly as throat but paler; flanks, thighs and undertail-coverts buff, streaked brownish black; underwing-coverts white; iris dark brown; upper mandible brownish or grey, lower mandible paler, particularly at base; legs brownish, sometimes tinged yellow or orange. Distinguished from *M. grimwoodi* mainly by more deeply coloured throat patch and belly, black breastband. Female differs from male in being paler and more buff, less red, below, necklace and breastband reduced to disjointed streaking. Juvenile has buff scalloping above, and is buff without breastband below; male may take two years to acquire adult plumage; immature female is less red below than adult, white on rectrices duller. Race *altanus* is smaller and shorter-billed than nominate, has dusky wedge on inner web of outer rectrix extending over proximal two-thirds; *wintoni* is similar to previous but less heavily streaked black above, forehead and crown with narrower streaks, rump and uppertail-coverts less heavily spotted black, feather edgings above paler, less heavy streaking on breast side and flanks. Voice. Song, in flight or from top of bush, a uniform "wee-tjihwee-tjih", or a series of squeaky whistled notes with wheezing final syllable, "pink-pink-pink-zheenk". Anxiety or alarm call a sharp "chuitt" or more metallic "tyang"; other calls include plaintive double "chuit chuit"; seldom calls in flight.
Habitat. Short tussocky, moist or wet grassland, either permanently or seasonally flooded, near swamps, marshes, floodplains of rivers, pans and other open water; also flooded cultivation, fallow rice fields and wet pasture on coast. From sea-level to 2200 m. Inhabits wide range of grassland types, from *Panicum repens* beds on Zambia-Zimbabwe border (L Kariba) to fine grasses such as *Sporobolus* by vleis and lakes; usually in treeless grassland, but in Zambia occurs in areas with scattered small acacia trees (*Acacia*), and in parts of Okavango Delta (Botswana) in areas with small tree islands. In Zambia, occupies wet grassland close to L Kariba whereas *M. fuellebornii* favours slightly higher, drier grassland nearby; usually in wetter habitats than those preferred by *M. croceus* and *M. capensis*, but sometimes occurs with those species on drier ground.
Food and Feeding. Larval and adult insects up to size of grasshopper (Orthoptera); also, small frogs occasionally taken. Forages on the ground, picking items from surface; also catches termite alates (Isoptera) in flight.
Breeding. Laying mainly during or after rains: Apr-Jun and Dec in Kenya, and Dec-Jan, Mar and May in Tanzania; Sept, Nov-Dec, Feb-Mar and Jun in Zambia, and Dec-Jan in DRCongo and Malawi; Nov-Apr in Zimbabwe, Mar in Mozambique and Sept-Apr in South Africa; birds in breeding condition in Oct in Botswana. Monogamous; territorial. Male sings in display-flight, rising high and circling or hovering, with legs dangling; or from top of tree or bush. Nest built by female, male in attendance, a deep, compact cup of dry grass, lined with rootlets and fine dry grass, placed on or above ground beside or between grass tussocks; may have a short entrance run through grass. Clutch 2-4 eggs, mean 2·8; incubation by female, for 13-14 days; nestlings fed by both parents for up to 16 days, male may deliver food to female, which passes it to chicks; distraction display by adult recorded during or just after nestling period, calls and hovers or flutters, legs dangling, above intruder, makes short flights to lead intruder away.
Movements. Mainly sedentary, locally nomadic; seasonal movements in response to rainfall and the burning or drying-out of grassland also recorded. Atlas surveys in S Africa suggest local movements, although apparent seasonality in occurrence possibly due to fact that the species may be more conspicuous early in breeding season. In wetlands with seasonal variations in water levels, however, breeding habitat deserted during times of high flooding or of drying-out. Recent sporadic records at L Kariba perhaps indicative of extensive nomadic movements.
Status and Conservation. Not globally threatened. Locally common to uncommon; not uncommon in Angola; uncommon in Kenya. Distribution disjunct. Has apparently disappeared from parts of S Mozambique, and fewer than 100 individuals estimated to survive in area S of R Save; suggested that the species has been adversely affected by human disturbance of marshland along coast, and that it is threatened in that region. Has also disappeared from parts of KwaZulu-Natal (South Africa), and concern has been expressed here about effects of encroachment of industry onto its grassland habitats; regarded as "Vulnerable" in South Africa. Elsewhere, drainage of wetlands a potential problem. In S Africa, highest reporting rates during 1997 surveys were from Okavango Delta (Botswana), where habitat largely secure, although increased human settlements and grazing by domestic livestock in N of delta, together with burning on floodplains, are of some concern. Formerly extended farther S in NE Botswana; contraction of range may be due to series of low-rainfall years in early 1990s.
Bibliography. Benson & Benson (1977), Benson *et al.* (1971), Berruti (1992), de Boer & Bento (1999), Britton (1970), Brooke (1984b), Brown & Britton (1980), Chapin (1953), Clancey (1964b, 1967b, 1996), Cooper (1985), Cruikshank (1963), Dean (1971, 2000), Ginn *et al.* (1989), Harrison *et al.* (1997), Irwin (1981), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993a), Medland & Karcher (1990), Parker (1999), Penry (1994), Short *et al.* (1990), Siegfried *et al.* (1976), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Skinner (1989), van Someren (1956), Stevenson & Fanshawe (2002), Steyn (1996), Tarboton (2001), Zimmerman *et al.* (1996).

53. Grimwood's Longclaw

Macronyx grimwoodi

French: Sentinelle de Grimwood **German**: Grimwoodpieper **Spanish**: Bisbita de Grimwood

Taxonomy. *Macronyx grimwoodi* Benson, 1955, Chitunta Plain, Mwinilunga District, north-west Zambia.
Genus probably closely related to *Tmetothylacus* and *Hemimacronyx*. Monotypic.
Distribution. S DRCongo S to WC & E Angola and extreme NW Zambia.



Descriptive notes. 19·5-21 cm. Male has cinnamon supercilium and malar area, black lores and moustachial stripe, cinnamon-brown ear-coverts; feathers of upperparts, including wings, cinnamon to tawny with blackish centres; rectrices dark olive-brown, T3 with white tip of inner web, T4 with white distal third of inner web, T5 with distal half of inner web white, outermost rectrix with inner web white, outer web pale brownish-grey; chin, throat and foreneck reddish to orange, rest of underparts dull cinnamon with tawny-buff wash, sometimes pinkish on centre of belly; breast, flanks, thighs and undertail-coverts streaked blackish; axillaries white, underwing-coverts fringed white; iris dark brown; bill dark horn, lower mandible paler, especially at base; legs horn-coloured or brown, often tinged pinkish or reddish. Differs from *M. ameliae* in having paler pink on underparts confined to throat and not surrounded by black, breast streaked,

flanks more narrowly and sparsely streaked, also larger size, longer and heavier bill. Female has paler chin and throat than male. Immature undescribed. Voice. Little known; aerial song said to be a series of whistled notes, "wee-wrrit, wee-wrrit" and the like, similar to that of *M. fuellebornii*.
Habitat. Moist short grass on plains, in river valleys, along drainage lines (dambos) and in grassy hollows, between 800 m and 1500 m. Sometimes occupies the wettest habitats when occurring alongside *M. ameliae* and *M. fuellebornii*, with latter in driest places; often, however, no obvious ecological segregation between present species and *M. fuellebornii*.
Food and Feeding. Little information. Apparently feeds on small insects such as beetles (Coleoptera), grasshoppers (Orthoptera) and pentatomid bugs (Hemiptera).
Breeding. Nest containing 2 eggs found in DRCongo in Feb (rainy season); not described. No other information.
Movements. Believed to be resident.
Status and Conservation. Not globally threatened. Data-deficient. Little recent information available on population size or threats to its habitats.Considered to be not uncommon in Angola; locally common in NW Zambia, where three pairs were found on Kamunoka Plain (Zambezi District) in Oct 1997, and estimated 1 pair/300 m on Chitunta Plain. Research and fieldwork required in order to establish main details of this species' ecology and biology, as well as its precise distribution and population level.
Bibliography. Aspinwall & Beel (1998), Benson, Brooke *et al.* (1971), Benson, Irwin & White (1959), Collar *et al.* (1994), Cooper (1985), Dean (2000), Dean *et al.* (1988), Derney & Demey (1998), Fishpool & Evans (2001), Harrison *et al.* (1997), Hockey (1997b), Keith *et al.* (1992), Leonard & Peters (1998), Mackworth-Praed & Grant (1963), Pedersen (2000), Sinclair & Ryan (2003).



PLATE 76

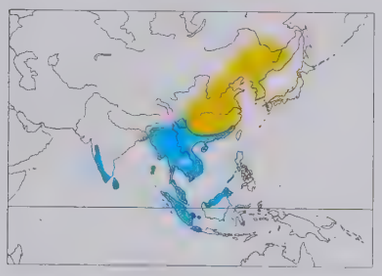
inches 3
cm 8

Genus *DENDRONANTHUS* Blyth, 1844

54. Forest Wagtail
Dendronanthus indicus

French: Bergeronnette de forêt **German**: Baumstelze **Spanish**: Lavandera Forestal
Other common names: Tree Wagtail

Taxonomy. *Motacilla indica* J. F. Gmelin, 1789, India.
Relationships uncertain; sometimes placed in genus *Motacilla*. Monotypic.
Distribution. Breeds from Russian Far East (S Ussuriland) S to SE China (S to SW Sichuan, N Guizhou and N Fujian) and S Japan (SW Honshu, NW Kyushu); also sporadically in NE India (Cachar Hills, in Assam). Winters in S & SE Asia.



Descriptive notes. 16-18 cm; 14-17 g. Small motacillid with distinctive wing and breast patterns. Adult has prominent, long, whitish supercilium, occasionally dark moustachial and malar stripes; upperparts greenish-tinged brownish-grey, uppertail-coverts blackish or blackish-brown; remiges blackish, edged whitish, yellowish-white bases forming patch on wing; lesser wing-coverts brownish-grey, tinged greenish, median and greater coverts blackish with yellowish-white tips (two wingbars); central pair of rectrices brownish-grey, tinged greenish, next four pairs dull blackish-brown, T4 sometimes tipped white, outer two pairs whitish with dark bases; underparts whitish, sometimes washed faintly yellow and buffy on flanks, two black crescent-shaped bands on upper breast (lower one sometimes broken), broader in centre; underwing-coverts whitish, underside of remiges dark grey with whitish bases (forming wingbar); iris dark brown; upper mandible dark grey, lower mandible pinkish, sometimes tipped dark; legs pale dull pinkish, hind claw short and curved. Sexes alike. Immature is browner, less green, above than adult, breastbands brownish-black and narrower, lower one completely or partially missing. VOICE. Song a disyllabic "tsi-fee" repeated 4-5 times; call a metallic "pink" or double "pink-pink".
Habitat. Forest, secondary growth and open woodland, to 1800 m. Wide variety of forests, both deciduous and evergreen, including mixed and sometimes pure coniferous forest, also dense riverine forest; in Russia, favours relatively young well-lit oak (*Quercus*) forest and mixed hardwood forests with oak predominant. Often along streams and tracks. In winter, also wooded cultivation and well-shaded coffee and cardamum plantations, parkland, glades and clearings in mixed bamboo jungle, mangroves. Also visits cattle yards and mudflats for foraging on passage and in winter; roosts communally in sugar cane, reeds and mangroves, in Thailand often with *Motacilla flava*.
Food and Feeding. Food consists of small invertebrates, such as ants (Hymenoptera), beetles (Coleoptera), small grasshoppers (Orthoptera), butterflies (Lepidoptera), cicadas (Cicadidae) and other hemipterans, and other insects, also spiders (Araneae), small molluscs and worms (Annelida). Forages mostly on the ground, running about quietly on shady forest paths or on mulch-covered forest floor; also in trees, running along horizontal boughs and up and down at a steep angle. When disturbed usually flies to perch in tree, sways tail and rear body from side to side. Singly or in pairs.
Breeding. Breeds mainly Apr-Jun. Monogamous; territorial. Nest built by female, accompanied by male, a compact firm cup of twigs, leaves, fine grasses and rootlets matted together with moss and cobwebs, draped with lichen to match surroundings, lining of hair, wool, fur or moss roots, placed c. 2-7 m above ground, sometimes higher, in small tree, often on horizontal branch or in crotch, usually by a stream. Clutch 4-5 eggs; incubation by female alone, fed on nest by male; chicks fed by both sexes; incubation and fledging periods not documented.
Movements. Migratory. Winters in India (mainly SW & NE), Bangladesh and Sri Lanka, and from Myanmar and S & SE China S to Greater Sundas; occasionally farther N, in Korea and SW Japan. Leaves breeding areas from late Aug, present on non-breeding grounds late Sept/Oct to Apr; arrival in breeding areas mostly in May. Accidental in Mongolia, Pakistan, Nepal, Philippines. Vagrants recorded a few times in Middle East.
Status and Conservation. Not globally threatened. Locally common, both in breeding and in non-breeding areas. First bred in Japan in early 1970s; previously only very rare migrant. Only occasional breeder in NE India, on the Laisung stream in N Cachar Hills (Assam); suspected breeding in SW Myanmar (Arakan Yomas) unconfirmed, believed unlikely. Very common in Thailand (especially in S) outside breeding season. No potential threats identified; no evidence that deforestation has led to any decline in population of this species.
Bibliography. Ali (1969, 1996), Ali & Ripley (1998), Alström & Mild (2003), Anderson & Baldock (2001), Barua & Sharma (1999), Brazil (1991), Carey *et al.* (2001), Curry-Lindahl (1980), Deignan (1945), Delacour (1947), Dementiev *et al.* (1970), Dickinson *et al.* (1991), Duckworth *et al.* (1998), Eames & Ericson (1996), Eames *et al.* (2001), Étchécopar & Hüe (1983b), Flint *et al.* (1984), Glenister (1971), Grimmett *et al.* (1998), Henry (1998), Jamdar (1982), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Khachar (1989), Knystautas (1987), Lekagul & Round (1991), Long Guozhen & Li Hanhua (1985), MacKinnon (1988), MacKinnon & Phillipps (1993), Madoc (1976), Majumdar *et al.* (1992), van Marle & Voous (1988), McClure (1998), McWhirter (1988), Medway & Wells (1976), Meyer de Schauensee (1984), Mitra (1980), Neufeldt (1961), Pardo & Gogorza y González (1997), Pfister (2001), Pittie (1997), Ripley (1982), Roberts (1992), Robson (2000), Smythies (1999), Stepanyan (1995), Sugathan & Varghese (1996), Won Pyongoh *et al.* (1968), Zheng Guangmei & Zhang Cizu (2002).

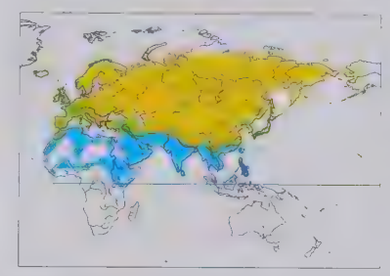
Genus *MOTACILLA* Linnaeus, 1758

55. White Wagtail
Motacilla alba

French: Bergeronnette grise **German**: Bachstelze **Spanish**: Lavandera Blanca

Other common names: Black-backed/Japanese Pied/Kamchatka Pied Wagtail (*lugens*); Black-eared/Hodgson's Wagtail (*alboides*); Indian White Wagtail (*dukhunensis*); Masked Wagtail (*personata*); Moroccan Wagtail (*subpersonata*); Pied/British Pied Wagtail (*yarrellii*); Streak-eyed Wagtail (*ocularis*); Swinhoe's Wagtail (*baicalensis*); Amur/White-faced Wagtail (*leucopsis*)

Taxonomy. *Motacilla alba* Linnaeus, 1758, Sweden.
Thought to form a superspecies with *M. maderaspatensis*, *M. grandis* and *M. aguimp*, all of which formerly often regarded as races of present species, and with recently described *M. samveasnae*; some recent analyses of mitochondrial DNA, however, suggest that *M. aguimp* possibly more distantly related to that group. Geographical variation marked and complex. Races often divided into four groups on basis mainly of breeding range: "nominate group" (including also *yarrellii*, *persica*, *dukhunensis*, *personata*, *baicalensis*), "*alboides* group" (with *leucopsis*), "*lugens* group" (with *ocularis*), and single-taxon "*subpersonata* group". In addition, several races sometimes regarded as separate species, but widespread intergradation occurs where races meet, and frequent co-occurrence evident in non-breeding quarters; in particular, *lugens* and *personata* often ranked as full species, but former appears to intergrade and interbreed with both *leucopsis* and *ocularis*, and latter with *dukhunensis*, *alboides* and *baicalensis*. Moreover, the described taxa *persica* and *dukhunensis* may be only inter-racial hybrids, perhaps better included within nominate. Proposed race *frontata* (described from Xiamen, SE China, where probably only migrant) provisionally included in *leucopsis*, though possibly of hybrid origin. Other named races include *forwoodi* (described from Abd al Kuri I, W of Socotra), included in nominate; and *albula* (Khasi Hills, in NE India), considered inseparable from *alboides*. Eleven subspecies currently recognized.
Subspecies and Distribution.
M. a. alba Linnaeus, 1758 - breeds SE Greenland, Iceland, Faeroe Is and throughout continental Europe (has bred Britain and Ireland) E to Urals, Turkey and Levant; winters in S part of range and S to W & E Africa, Arabia and SW Asia.
M. a. yarrellii Gould, 1837 - breeds Britain and Ireland, possibly also N parts of W Europe; partial migrant, winters S to NW Africa.
M. a. dukhunensis Sykes, 1832 - breeds from C Russia (Ural Mts E to Taymyr Peninsula) S to Caucasus, NW Iran, Kyrgyz Steppes and foothills of Altai Mts; winters Middle East E to Indian Subcontinent.
M. a. ocularis Swinhoe, 1860 - breeds N & NE Siberia (E from Taymyr Peninsula and R Yenisey, S to Lensk region, Stanovoy Mts and N Kamchatka) and extreme NW USA (W Alaska); winters S Asia E from NE Indian Subcontinent.
M. a. subpersonata Meade-Waldo, 1901 - NW Africa (W Morocco).
M. a. persica Blanford, 1876 - NC & W Iran (S Elburz Mts, Zagros Mts).
M. a. personata Gould, 1861 - breeds C Asia from Transcaspia and N Iran E to S Russia (W Sayan Mts), W Mongolia, extreme NW China (NW & W Xinjiang) and S to N Afghanistan, N Pakistan and Kashmir; winters Iran and E Arabia E to Indian Subcontinent.
M. a. baicalensis Swinhoe, 1871 - breeds SC Siberia (upper R Yenisey E to Stanovoy Mts) S to Mongolia and NE China (NE Nei Mongol); winters N India E to SE China and C Indochina.
M. a. lugens Gloger, 1829 - breeds SE Russia (from S coasts of Sea of Okhotsk, Sakhalin, C Kamchatka and Commander Is) S to N Korea and Japan; winters Myanmar E to SE China, Taiwan and S Japan.
M. a. leucopsis Gould, 1838 - breeds C & E China (Qinghai E to Heilongjiang and W Zhejiang, S to N Guangxi and N Guangdong), Russian Far East (Amurland, Ussuriland), Korea and SW Japan (SW Honshu, N Kyushu); winters S Asia E from N India.
M. a. alboides Hodgson, 1836 - breeds Himalayas (E from NE Pakistan), S China (S Xizang, S & SE Qinghai E to S Shaanxi, S to Yunnan and Guizhou), N Myanmar, extreme N Laos and extreme N Vietnam; winters in foothills and S to Bangladesh and N Thailand.



Descriptive notes. 16·5-18 cm; male 20-24·6 g, female 17·6-21·9 g (to 27·9 g when laying). Male nominate race in breeding plumage has mid-crown to nape and hindneck black, chin and throat black, rest of head white; mantle and scapulars to uppertail-coverts grey; wings greyish-black, tertials broadly edged white, broad white fringes on median and greater wing-coverts (two white wingbars); central pair of rectrices black, narrowly fringed white, next three pairs black, outer two pairs white with dark wedge on inner web; black of throat extends down to breast; rest of underparts white, washed greyish on breast side and flanks; iris blackish-brown; bill and legs black. Breeding female differs from male in slightly duller head pattern, sometimes some grey on crown, usually some grey on nape, thus less contrast with mantle, often some pale spots on throat. Both sexes non-breeding have olive-grey wash on crown and nape, white chin, throat and upper breast with some black mottling. Immature has brownish-grey head, dusky moustachial stripe, greyish-white chin and throat, rest of underparts also greyish-white, sometimes tinged buffy, with narrow dark grey-brown gorget. Races differ mainly in colour of back and/or rump and pattern of black and white on head (all have white forehead) of male, to which following details refer, females often difficult to ascribe to race: *yarrellii* has black back; *subpersonata* has more black on head, extending to lores, cheeks and ear-coverts and meeting black of chestband, with short supercilium, moustachial stripe and patch on neck side white; *ocularis* differs from nominate in blackish eyestripe (may be indistinct), more white on wing-coverts (often white wing panel); *lugens* has jet-black back, black eyestripe, white chin (sometimes speckled blackish), white remiges and primary coverts with some blackish on distal parts of primaries, outer rectrix usually all white, inner web of T4 often white; *leucopsis* has jet-black back, white chin and upper throat, white breast side, remiges with narrow white tips, secondaries broadly edged white, greater coverts and tips of medians white, outer rectrix all white; *baicalensis* resembles previous, but back grey, slightly less white on head, less white in wings; *alboides* has black back, much black on head and neck, white confined to forehead and area around eye, large white wing panel, white edges of secondaries and tertials; *personata* resembles previous, but upperparts grey, not black; *dukhunensis* has upperparts on average somewhat paler, more blue-grey, than nominate, more white on wing-coverts (sometimes forming unbroken panel); *persica* is generally intermediate between previous two, much individual variation. VOICE. Song a warbling twitter of repeated slurred "zit", "psit", "ziti", "zilipp", "zittip" and similar contact calls. Call, in flight, a high-pitched "chissik" or "tscizzic" or monosyllabic "zit" or "psit" (nominate race), or "ziti" (*baicalensis*), or more shrill "tschizzik" or "tissick" or "chisk" (*yarrellii*); "pii-tup" or "piiup" like sparrow (*Passer*) chirp in Iran (*personata*); twittering noises at roost.

On following pages: 56. White-browed Wagtail (*Motacilla maderaspatensis*); 57. Japanese Wagtail (*Motacilla grandis*); 58. Mekong Wagtail (*Motacilla samveasnae*); 59. African Pied Wagtail (*Motacilla aguimp*).

Habitat. Very wide variety of non-forested wet and dry habitats, including seashores, rocky or sandy upland rivers and slow-moving lowland rivers, lakeshores, farmland, gardens, parks, short grassland such as that found in vicinity of factories in towns and cities; frequently around human habitations in towns and villages. On migration and in winter months, also edges of reservoirs, lakes, ponds and sewage works, wells in deserts, irrigated fields and rice fields, as well as in wide variety of open short grasslands and other sites in towns and villages, at campsites and on beaches. Largely restricted to vicinity of running water throughout year in NW Africa (race *subpersonata*). Breeds from lowlands to mountains, to 5000 m in Himalayas; recorded on passage to 5700 m in W China (S Xizang). Roosts communally in trees, sometimes in reedbeds; often on or inside buildings, such as factories and glasshouses, in urban areas.

Food and Feeding. Food includes wide range of small terrestrial and aquatic invertebrates, ranging from weevils (Curculionidae) and other beetles (Coleoptera), dragonflies (Odonata), adult and larval flies (Diptera), termites (Isoptera) and ants (Hymenoptera) to spiders (Araneae), small snails (Mollusca), crustaceans and worms (Annelida), as well as fish fry; crumbs and other household scraps also taken. Observed to take fly maggots from carcasses. In one study in England, dipterans comprised 96·7% of 4654 items from faeces collected by pools, and the birds also took mainly dipterans (87·5% of 779 items) when foraging at dung pats; small beetles made up the rest of the diet in both cases. In Russia, dipterans again accounted for more than 50% of items in one study, although other aquatic invertebrates and beetles formed a major part of the diet in other studies. Forages while walking, readily exploiting lawns, bare areas, roads and pavements, roofs and other open areas. Picks at items on the ground or darts forwards (run-picking) to snatch prey; jumps up to take insects in the air or makes short flights to catch aerial prey (flycatching). Sometimes wades in shallow water, picking invertebrates from the surface or in mud, or hovers over water or vegetation to snatch prey. Also forages amidst seaweed along tideline. May follow ploughs on farmland. Singly or in pairs; frequently in loose flocks when on migration, and also at rich winter feeding areas and at roosts; some, especially adult males or pairs, maintain individual and regular feeding areas during winter months.

Breeding. Mostly early Apr to Aug, starting later in N; late Apr to mid-Jul in S & SE Europe, Apr-Jun in Morocco and May to early Aug in S Asia (*alboides*); up to three broods. Monogamous; strictly territorial, and highly aggressive towards both conspecifics and congeners. Nest, built by both sexes, a rough cup of twigs, grass stems, leaves, rootlets and mosses, lined with hair, wool or feathers, sited in hole or crevice in riverbank, wall or bridge, and often in building or even in machinery. Clutch 3-8 eggs, usually 4-6; incubation by both parents, female taking greater share and she alone sitting at night, period 11-13 days, sometimes up to 16 days; chicks fed by both parents for 11-16 days; fledglings fed by parents for up to 1 week.

Movements. Most races regular long-distance migrants; others partial migrants or largely resident. In Europe, some W & S populations of nominate race and of *yarrellii* resident, but N populations of latter are partial migrants, moving S & SW to as far as Iberia and NW Africa in autumn; mostly resident in NW Africa (*subpersonata*). All N & E populations move S after breeding. Nominate race regularly migrates S into S & SW Europe. N half of Africa (mainly in the arid N bordering the Sahara) and S Asia; in Africa winters S to Sahel zone and to Uganda and Kenya, and a few as far S as Malawi, but rarely occurs S of Tanzania; fairly common passage migrant through Somalia and a regular winter visitor in small numbers to S Sudan. Asian populations winter in Arabia (nominate, *personata*) and across S parts of Asia, where up to six races found together in winter quarters from Indian Subcontinent E to SE China; *ocularis* and *leucopsis* move farthest S, to Malay Peninsula and Philippines, and former recorded also in W North America (S to Mexico); accidental in Australia (*baicalensis*, *lugens*, *leucopsis*) and Seychelles (nominate or *dukhunensis*). Migrants leave breeding grounds Aug-Oct, return mainly Mar-Apr, often not until late May in N of range. In Iranian mountains (*persica*) and in E Himalayas to S China (*alboides*) generally shorter movements, involving post-breeding descent to lower elevations.

Status and Conservation. Not globally threatened. Generally common throughout its breeding and non-breeding ranges; locally very common or abundant. Estimated European population over 12,000,000 breeding pairs; population generally stable, although sometimes temporary declines following severe winters. Breeding density has been correlated variously with food supply and with availability of enclosed nest-sites found in human settlements; in Europe average densities c. 1-4 pairs/km², but up to 43 pairs/km² in rural villages in Germany. No comparable data for Asia, but appears to be generally common and widespread; race *lugens* common in Japan, where winter roosts of 2000-7000 recorded. Has adapted well to man-made environments, and exploited opportunities for nesting and roosting offered by buildings and other artificial structures, and for foraging by lawns, roads and open surfaces. A highly successful species.

Bibliography. Adamian & Klem (1999), Akhtar & Prakash (1989), Ali & Ripley (1998), Ali *et al.* (1996), Alström & Mild (2003), Anon. (1998a), Archer & Godman (1937-1961), Armstrong (1983), Ash & Miskell (1998), Badyaev *et al.* (1996), Baicich & Harrison (1997), Bannerman & Bannerman (1965), Beasley (1995), Benson (1946a), Benson & Benson (1977), Birrer (1994), Borrow & Demey (2001), Brazil (1991), Broom *et al.* (1976), Carter *et al.* (1995), Chemyakin (1988), Christidis & Boles (1994), Cop (1985), Cramp (1988), Davies (1976, 1982), Davies & Brooke (1989a, 1989b), Davies & Houston (1981, 1983), Davis (1966), Deignan (1945), Dementiev *et al.* (1970), Dolnik & Gracheva (1990), Dougall (1991, 1992, 1995, 2002b), Duckworth *et al.* (2001), Emley (1985), Étchécopar & Hüe (1983b), Fitzpatrick (1996), Flousek (1986), Fotteler *et al.* (1984), Goodman *et al.* (1989), Greaves (1941), Grimmett *et al.* (1998), Heinroth & Steinbacher (1952), Hellmayr (1935), Herrera (1984), Higuchi & Hirano (1983b, 1989), Hirano (1985), Houston *et al.* (1985), Howell & Webb (1995a), Jeyarajasingam & Pearson (1999), Kanowski (1982), Karhe (1966), Kaufman (1996), Keith *et al.* (1992), Kennedy *et al.* (2000), Leinonen (1973a, 1973b, 1974), Lekagul & Round (1991), Lundberg (2001), Mackworth-Praed & Grant (1960, 1973), McClure (1998), Mlodinow & O'Brien (1996), Morcombe (2000), Morlan (1981), Nakamura *et al.* (1984), Nikolaus (1987), Nishigai & Hirata (1980), Norton (1958), Ohsako (1996), Ossiannilsson (1978), Patten (1982), Perray (1978), Persson (1977), Porter (1983), Rezanov (1981), Rheinwald (1991), Ridgway (1904), Ripley (1982), Roberts (1992), Ruck (1969), Sangster, Hazevoet, Van den Berg & Roselaar (1998), Sangster, Hazevoet, Van den Berg, Roselaar & Sluys (1999), Schroeter (1983), Sellin (1993), Shigeta (1995, 1996a), Shirihai (1996), Simmons (1965), Simms (1992), Smith (1968a), Smythies (1986, 1999), Snow & Perrins (1998), Sonobe (1982), Tatin (1997), Voelker (2002), Watanake & Maruyama (1977), Weber & Hegelbach (1993), Würtele (1986), Zahavi (1971), Zheng Guangmei & Zhang Cizu (2002).

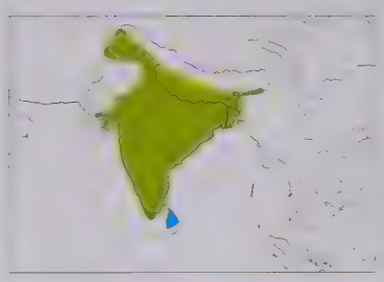
56. White-browed Wagtail

Motacilla maderaspatensis

French: Bergeronnette indienne **German**: Mamulastelze **Spanish**: Lavandera India
Other common names: Large Pied Wagtail

Taxonomy. *Motacilla maderaspatensis* J. F. Gmelin, 1789, Madras, Tamil Nadu, India.
Formerly regarded as a race of *M. alba*. Thought to form a superspecies with that and with *M. grandis*, *M. samveasnae* and *M. aguimp*, although recent analyses of mitochondrial DNA suggest that last species possibly more distantly related to this group. Birds from Punjab region, described as race *kangrae*, generally considered indistinguishable from other populations. Monotypic.

Distribution. N Pakistan E in Himalayan foothills to Bangladesh, probably to Arunachal Pradesh, and S through most of peninsular India.



Descriptive notes. 21-24 cm; 30-36 g. Rather large wagtail. Male has all-black head except for broad white supercilium from bill to rear of ear-coverts, very thin white crescent below eye; upperparts mostly black, median and greater wing-coverts mostly white, primary coverts black, edged white; remiges blackish, tipped white, primaries with basal two-thirds also white, secondaries with basal half of outer webs white, much of closed wing appearing white (large white wing patch in flight); tail black, outer two rectrices white with inner webs edged black; throat and side of neck to upper breast black, rest of underparts white, greyish wash on flanks, underwing-coverts whitish; iris dark brown; bill and legs blackish. Female is usually greyer or duller black above, primaries browner. Immature has supercilium shorter (starts from above eye), black areas of upperparts greyish-brown, breast side tinged greyish-buff, rest of underparts white; bill more brownish, pinkish base of lower mandible. Voice. Song a clear, high-pitched jumble of loud pleasant whistling notes; call a loud "chiz-zit", given in flight.

Habitat. Watercourses. Favours streams and rivers, especially smooth-flowing rivers with rocks and stony shoals, but occurs along any watercourse; also at irrigation tanks, lakes, pools and wells, and sometimes in paddyfields and on lawns. To 1500 m, mainly below 915 m in N, sometimes to 1700 m in Nepal; to 2200 m in hills in S India. Outside breeding season roosts in flocks in tamarisks (*Tamarix*) or reeds, often with other wagtail species and with swallows (Hirundinidae).

Food and Feeding. Diet consists of insects, especially small coleopterans (e.g. Tridactylinae), grasshoppers (Orthoptera) and dragonflies (Odonata), also snails (Mollusca) and other small items. Picks prey items from sand and among pebbles, usually along water's edge, while walking or running.

Breeding. Laying Mar-Jun, rarely Sept-Oct, in N, and Dec-Jun in S, coinciding with low water levels in dry season. Monogamous; territorial. Nest built by both sexes, a bulky structure of roots, grass and various materials, neat cup lined with hair or wool, placed near water in variety of sites, including hole in bank, wall or building, ledge under bridge, crevice in tree trunk or rock face, in clump of vegetation on wall or rock, in disused nest of dipper (*Cinclus*); also in river ferryboat in constant use. Clutch 3-5 eggs, usually 4; incubation and fledging periods not documented; young cared for by both sexes.

Movements. Mainly resident, living in pairs throughout year. Descends from highest elevations to lower levels after breeding. Some dispersal; rare non-breeding visitor in Sri Lanka.

Status and Conservation. Not globally threatened. Fairly common to locally common, and widespread; scarce in Bangladesh. Probably occurs in NE India (Arunachal Pradesh, N Assam), but status there uncertain. Reports from S China (Yunnan) in 19th century considered of doubtful validity. Unlikely to be at any major risk in immediate future; nevertheless, construction of new dams and reservoirs, leading to submergence of lowland rivers, could place populations at risk locally.

Bibliography. Ali (1969, 1996), Ali & Ripley (1998), Ali *et al.* (1996), Alström & Mild (2003), Anon. (1998d), Barua & Sharma (1999), Chakravarthy & Tejasvi (1992), Chanda (1998), Daniels (1997), Gokula & Vijayan (1997), Grewal (1995), Grimmett *et al.* (1998, 2000), Harrison (1999), Hasan (2001), Henry (1998), Inskipp & Inskipp (1991, 1993), Inskipp *et al.* (1996), Javed & Rahmani (1998), Kazmierczak (2000), Kirkpatrick (1954b), Lamsfuss (1998), Mahabal & Lamba (1987), Majumdar *et al.* (1992), Mason & Lyczynski (1980), Mohan (1997), Mukherjee (1995), Phillips (1978), Pittie (1997), Purandare (2002), Ripley (1982), Roberts (1992), Shrestha (2000), Srinivas & Subramanya (2000), Sugathan & Varghese (1996), Voelker (2002), Whistler (1923).

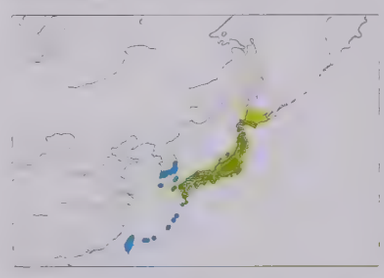
57. Japanese Wagtail

Motacilla grandis

French: Bergeronnette du Japon **German**: Japanstelze **Spanish**: Lavandera Japonesa
Other common names: Japanese Pied Wagtail

Taxonomy. *Motacilla grandis* Sharpe, 1885, Japan.
Formerly treated as conspecific with *M. alba*, but the two breed sympatrically in Japan. Both thought to form a superspecies with *M. maderaspatensis*, *M. samveasnae* and *M. aguimp*, although recent analyses of mitochondrial DNA suggest that last species possibly more distantly related to this group. Monotypic.

Distribution. Breeds in Japan; non-breeding visitor to Korea (has bred) and S to Taiwan.



Descriptive notes. 21-23 cm. Male has forehead, supercilium, chin and very thin white crescent below eye white; rest of head, down to breast, and upperparts black; primaries mostly white, dull blackish distally, edged and tipped white, secondaries all white, median and greater wing-coverts mostly white (wing appearing mostly white both when closed and in flight); tail black, outer two rectrices white with black edging on inner webs; underparts below breast white, underwing-coverts white; iris dark brown; bill and legs blackish. Female is more greyish-black above, diffuse dark markings on remiges, dark tips of white primary coverts. Immature has head grey, tinged brown, supercilium off-white and often indistinct, upperparts pale grey, blackish uppertail-coverts. Voice. Song, by both sexes (male in most months, female mainly Feb), comprises basic notes and short phrases combining different notes, e.g. "ji", "ju", "joi", "byu", "bui", "pouyu", "fi", "gi" and similar; simple song a repetition of same phrase, grading into more complex songs, continuing for 40-60 seconds without pause, e.g. as "tztzui tztzui tztzui pitzpitz tztzui pitzpitz-bitbitzeen bitbitzeen-bitbitzeen tztzui tzgichigi jijijiji". Call in flight, on take-off or when landing, "bi" or "ji"; warning calls when predator near nest include "pitzuin" or "pisui" and longer rattling chatter.

Habitat. Riparian habitats, dry riverbeds and rice fields, along large rivers with gravelly shores; also around open spaces in towns. More in coastal areas in winter. Sea-level to 1500 m. Overlap in habitat with *M. alba* (race *lugens*) in breeding season.

Food and Feeding. Arthropods. In urban areas, prey largely flies (Diptera), especially craneflies (Tipulidae), forming 88% of items fed to chicks; spiders (Araneae) made up much of remainder of food, although some mole-crickets (*Gryllotalpa*) taken and these were important by weight. Away from urban areas, along rivers, mayflies (Ephemeroptera) and stoneflies (Plecoptera) more important than dipterans in diet. Forages mainly by walking and picking prey from the ground.

Breeding. Laying Mar-Jul; 2-3 broods. Monogamous, occasional bigyny recorded; normally solitary, and territorial, aggressive towards conspecifics and congeners, notably *M. alba* (race *lugens*).

Nest built by both sexes, taking c. 16 days (but as little as 4-5 days for later nests), a cup of leaves, rootlets and grass stems, lined with finer material, typically sited in vegetation on riverbank or on gravel shoal, in towns frequently on or under roof of building, less commonly on branches of tree or in wood pile. Clutch 4-7 eggs, mainly 5; incubation by both sexes, period 11-13 days; chicks brooded mainly by female, fed by both sexes, both also remove faecal sacs, nestling period 13-15 days; fledglings accompanied by and fed by parents for c. 15 days, gather in communal roosts from mid-summer, later joined there by adults of population.

Movements. N populations (N Hokkaido) appear to move S & W in autumn; non-breeding visitor to Ryukyu Is, scarce but regular visitor to Korea Dec-Mar, and occasional winter visitor to Taiwan and coast of E China.

Status and Conservation. Not globally threatened. Common and widespread in S Hokkaido, Honshu, Kyushu and Shikoku, and on Sado I (off W Honshu). Less common in N & C Hokkaido, where largely replaced by *M. alba* (of race *lugens*); recent expansion of latter has led to more overlap and, probably, increased competition. Status in Korea uncertain; pair bred in 1966, and thought by some to be a rare resident; possibly local and uncommon breeder in extreme S and on E coast, but more study needed.

Bibliography. Alström & Mild (2003), Austin (1948), Austin & Kuroda (1953), Brazil (1991), Étchécopar & Hüe (1983b), Gore & Won Pyongoh (1971), Haneda & Shinoda (1969), Higuchi & Hirano (1981, 1983a, 1983b, 1989), Higuchi & Nakamura (1983), Hirano (1980, 1981, 1985), Hirano & Higuchi (1986), Inskipp *et al.* (1996), Kanouchi *et al.* (1998), Meyer de Schauensee (1984), Nakamura (1982, 1985), Nakamura *et al.* (1984), Ohsako (1989), Ohsako & Yamagishi (1989), Shigeta (1995, 1996b), Sonobe (1982), Uchida & Nagata (2000), Won Pyongoh (1993), Yoon Mooboo (1992).

58. Mekong Wagtail

Motacilla samveasnae

French: Bergeronnette du Mékong **German**: Mekongstelze **Spanish**: Lavandera del Mekong

Taxonomy. *Motacilla samveasnae* Duckworth *et al.*, 2001, San River, Stung Teng province, Cambodia.

Recently described species. Thought to form a superspecies with *M. alba*, *M. maderaspatensis*, *M. grandis* and *M. aguimp*, although recent analyses of mitochondrial DNA suggest that last species possibly more distantly related to this group. Monotypic.

Distribution. Lower R Mekong and tributaries in extreme S Laos and NE Cambodia (upstream from Kampi), also marginally in adjacent parts of Thailand and Vietnam.



Descriptive notes. 17-17·5 cm. Male has forehead to nape blackish, long, broad white supercilium, very thin white crescent below eye, blackish lores, ear-coverts and neck, white triangular patch on lower neck side; upperparts blackish-brown; remiges white proximally, dark distally, lesser wing-coverts brownish-black, outer median coverts white with blackish bases, inner ones blackish with white tips and edges, greater coverts blackish with white tips (two white wingbars); tail blackish, tinged brownish, outer two rectrices white with blackish base of outer web and edge of inner web; chin and throat white, broad blackish U-shaped breastband, rest of underparts white, tinged grey; iris dark brown; bill black; legs greyish-black. Distinguished from *M. aguimp* by smaller size, proportionately longer bill, more extensive white outer edges of primary feathers. Adult female is paler and greyer above than male, with less white in wing. Immature is browner above. Voice. Simple song a brief rapid series of rather thin, high-pitched, often rather harsh notes, all notes different and phrases or rattles rare, each series interspersed by pause of 4-6 seconds or more, same series may be repeated several times; resembles song of *M. grandis* but with fewer harsh notes, lacks drawn-out rolls of *M. maderaspatensis*, lacks frequent phrases and rattles of *M. aguimp*. Complex song a drawn-out, rapid ramble of notes, many as in simple song, but with high proportion of harsh, drawn-out notes and buzzing sounds like those of e.g. Eurasian Siskin (*Carduelis spinus*), and resembling that of *M. grandis*. Flight call a short, sharp, rather harsh "dzeer", sometimes doubled or repeated several times, resembles that of *Anthus spinoletta* and *A. petrosus*, also of *M. grandis* but lower-pitched and less clipped; softer, lower-pitched versions given when perched or in flight.

Habitat. Broad lowland rivers; requires braided sections of river with swift-flowing water, and with distinctive mosaic of sandbars and gravel shoals and numerous emergent rocks and bushes ("channel mosaic"). Appears to shun exposed areas such as sandbars and earth banks, as well as higher islands with vegetation resembling that of adjacent floodplain. Most records are from rivers more than 100 m wide.

Food and Feeding. Little known. Diet probably small arthropods. Forages regularly within tops of emergent bushes, walking along branches and picking small food items from these or from the leaves. Foraging behaviour outside breeding season not known.

Breeding. Breeds Feb-Apr, in later part of low-flow season. No other information.

Movements. Little known. Appears to leave breeding habitats during season of high water flow, when channel mosaics submerged; only one record from R Mekong outside breeding period.

Status and Conservation. Not globally threatened. Initially described as recently as 2001. Numbers considered currently healthy in Cambodia, but status in Laos uncertain; at least three pairs found in Vietnam (R Serepok, in Yok Don National Park) in 2003. Occurs in several protected areas in Laos and Cambodia, and potentially in Thailand. Channel mosaic considered less vulnerable than other river-channel habitats, but new dams pose one of greatest threats. Recent proposal to blast and dredge R Mekong for the Lancang-Mekong Navigation Channel Improvement Scheme, if carried out, would place this species at serious risk; blasting and clearance of rapids, shoals and reefs to facilitate navigation would directly affect river habitats in China, Myanmar, Laos and Thailand, and also indirectly affect river life in Cambodia and Vietnam. Following numerous objections sent to governments of China, Myanmar, Laos and Thailand, pointing out inadequacies of an environmental-impact assessment and the ecological consequences if the scheme were to go ahead, the project did not start in 2002; continued monitoring of the situation essential. In addition, fieldwork is required in order to establish details of this species' ecology and behaviour.

Bibliography. Alström & Mild (2003), Anon. (2001h, 2002e, 2003d), Davidson *et al.* (2001), Duckworth *et al.* (2001), Pitches (1997), Scott & Pitcher (2002).

59. African Pied Wagtail

Motacilla aguimp

French: Bergeronnette pie **German**: Witwenstelze **Spanish**: Lavandera Africana
Other common names: African Wagtail

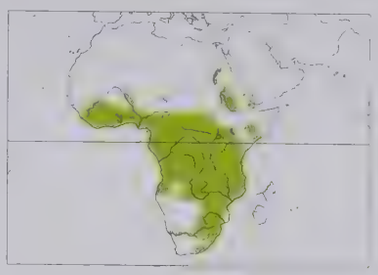
Taxonomy. *Motacilla aguimp* Dumont, 1821, Lower Orange River, South Africa.

Thought to form a superspecies with *M. alba*, *M. maderaspatensis*, *M. grandis* and *M. samveasnae*; recent analyses of mitochondrial DNA, however, suggest that it is possibly more distantly related to this group, and may be a sister-taxon to a group containing *M. alba* (with race *lugens*), *M. flava*, *M. citreola* and *M. cinerea*. Two subspecies recognized.

Subspecies and Distribution.

M. a. vidua Sundevall, 1850 - Sierra Leone and S Mali E to S Sudan and NW & E Kenya, S to Angola, N & E Botswana and E South Africa (S to Eastern Cape); also lower Nile Valley (S from S Egypt), and discontinuously N & E Sudan, W Eritrea, NW, NE & S Ethiopia, and S Somalia.

M. a. aguimp Dumont, 1821 - R Orange and R Vaal drainages in S Namibia, C South Africa and Lesotho.



Descriptive notes. 20 cm; male 22-33 g, female 23-30 g. Male nominate race in breeding plumage has broad white supercilium from bill base to well behind eye, squarish white patch on side of neck; centre of forehead to nape, also lores, subocular area, ear-coverts and vertical band on neck side black; mantle, scapulars and back black, rump greyish-black, uppertail-coverts black, lateral ones with white outer webs; primaries black with narrow white tips, large white area on both webs at base, secondaries black, broadly tipped white, outer web edged white, tertials black with outer webs broadly edged white; alula, primary coverts and lesser wing-coverts black, median and greater coverts white; tail black, central pair of feathers sometimes with wide white edging, outer two pairs white, T5 with black edging on inner web; chin to uppermost breast white, broad black pectoral band narrower at side, black blotching on side of breast and flanks, rest of underparts white; underwing-coverts white; iris dark brown; bill and legs black. Differs from similar *M. samveasnae* in somewhat larger size, proportionately shorter bill, less white on outer edges of primaries. Non-breeding male has black of upperparts replaced with slate-grey. Breeding female has dark areas less intensely black; in non-breeding plumage upperparts are dark olive-grey. Immature has black of adult plumage (except remiges and rectrices) replaced with dark olivaceous grey-brown, white replaced with buffy white, greater and median primary coverts white with buffy tips. Race *vidua* differs from nominate in narrower, better-defined breastband, lacks black blotching on breast side and flanks, has outer rectrix entirely white and adjacent one with less black. Voice. Song a sustained melodious series of whistling and piping notes, "weet-weet, wip-wip-wip, weet, wee-wee" and so on, likened to song of Atlantic Canary (*Serinus canaria*); imitates other species, including Common Bulbul (*Pycnonotus barbatus*) and Chattering Cisticola (*Cisticola anonyma*). Call a high-pitched sharp "tweet" or "chizzit", and more liquid rapid trisyllabic "quick-quick-treeet", "twee-twee-twee" or "tseet-tseet-tseet" with final note very high, or a whistled thin but loud "tuwhee".

Habitat. In humid tropical regions occurs near human habitations, as at farms, in villages, on roofs and roads in towns and cities, in parks and on garden lawns, as well as around reservoirs, lakes, coastal lagoons, sewage ponds, and on sandy banks or rocky areas along or in rivers. In drier areas more restricted to perennial rivers with rocks and sandbanks and to other permanent waterbodies, such as reservoirs. Sea-level to moderate elevations; to 3000 m in E Africa. Communal roosts in non-breeding season in trees, on buildings, even on boats.

Food and Feeding. Diet includes wide variety of small terrestrial and aquatic invertebrates, mainly insects. Recorded items include adult and larval flies (Diptera), beetles (Coleoptera), grasshoppers (Orthoptera), dragonflies (Odonata), ants (Hymenoptera), termites (Isoptera), butterflies (Lepidoptera), crustaceans, worms (Annelida). Small fish also taken; and household crumbs and scraps eaten. Forages by walking and picking, or darting forward to snatch prey on the ground or from low vegetation (run-picking); also by jumping up to snatch an insect, or by aerial fly-catching. Occasionally hovers over water to pick insects from surface. Outside breeding season, flocks of up to 100 sometimes congregate at favoured feeding areas, e.g. sewage farms, individuals and small groups foraging in close proximity to one another.

Breeding. Starts to breed prior to rains and continues into wet season: mostly Feb-May in W Africa, Oct-Apr in Nigeria, Aug and Dec-Feb in Gabon, probably all months in DRCongo; most or all months (mainly Feb-Dec) in E Africa, Dec-Oct in coastal Kenya and S Somalia; Feb-May and Aug-Nov (mainly Mar, Sept, Oct) in Malawi, and Feb-Dec (mainly Sept) in Zambia; in all months except Jan (peak Aug-Oct) in Zimbabwe; all months except May, mainly before and at start of rains, peak in Sept-Oct, in South Africa; usually 2-3 broods, in Kenya up to seven recorded in a season. Monogamous; solitary, and territorial, very aggressive towards conspecifics, sometimes also towards other species, e.g. *M. cinerea* and Common Sandpiper (*Actitis hypoleucos*). Nest, built by both sexes, a bulky cup of grass, stems, rootlets, leaves, downy seeds and feathers, occasionally seaweed and coconut fibres incorporated, lined with grass, hair, feathers or fine rootlets, placed on ground in grass tussock or other vegetation, in riverbank, in flood debris, in crevice or on ledge in cliff or in house roof or outbuilding, sometimes on boat. Clutch 2-7 eggs, usually 3-4; incubation by both sexes, mainly by female, period 13-14 days; chicks fed by both sexes, nestling period 15-16 days; juveniles fed by both parents for c. 2 weeks after fledging. Nests parasitized by Red-chested Cuckoo (*Cuculus solitarius*), Diederik Cuckoo (*Chrysococcyx caprius*) and Jacobin Cuckoo (*Clamator jacobinus*).

Movements. Largely resident; some movements, but not fully understood. Much local movement thought to take place in many countries, but data for S Africa reveal little evidence of large-scale seasonal movements; an uncommon vagrant in Botswana away from N & NE breeding areas. Non-breeding visitor to Pemba I and Zanzibar, off NE Tanzania; recorded also in W Chad (L Chad), on São Tomé and in SW South Africa.

Status and Conservation. Not globally threatened. Common and widespread in much of range, and generally tame and confiding; common to uncommon in W Africa. Locally common in S Sudan, but absent in extreme SE, the Sudd and the region NW of Wau. Uncommon in Somalia, only 19 records to 1991, along lower R Juba; three old records on coast at Baraawe, somewhere on R Shabeelle and on Ethiopian side of border. Widespread and common in Kenya (except N & NE); very common in Malawi below 1500 m and in Viphya Mts (at 1830 m) and Nyika Plateau (at 2240 m). Appears to have declined as a breeding bird during 20th century along Nile Valley in Egypt. Over much of S Africa has possibly benefited from construction of dams and from creation of lawns and ponds in parks and gardens, although drying-up of rivers through overabstraction may have caused some local declines.

Bibliography. Alström & Mild (2003), Anon. (1966), Ash & Miskell (1998), Bannerman (1953), Benson (1946a), Benson & Benson (1977), Borrow & Demey (2001), Brash (1994), Brooke (1970), Brosset & Erard (1986), Chapin (1953), Cheke & Walsh (1996), Christy & Clarke (1994), Clancey (1964b), Cramp (1988), Dean (2000), Donnelly (1976, 1977, 1978), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Duckworth *et al.* (2001), Edwards (1988), Elgood *et al.* (1994), Gatter (1997), Ginn *et al.* (1989), Goodman *et al.* (1989), Grimes (1987), Harrison *et al.* (1997), Hickling (1983), Keith *et al.* (1992), Larsen (1991), Liggitt (1985), Mackworth-Praed & Grant (1960, 1962, 1973), Maclean (1993a), Mason & Lyczynski (1980), McGill (1992), Meinertzhagen (1930), Morel & Morel (1990), Nevill (1987), Nhlane (1990, 1992), Nikolaus (1987), Penry (1994), Pitman (1966), Sinclair & Hockey (1996), Snow & Perrins (1998), Tarboton (2001), Taylor (1978), Tree (1963b), Vader (1982), Vernon (1973), Voelker (1999c, 2002).



PLATE 77

inches 4

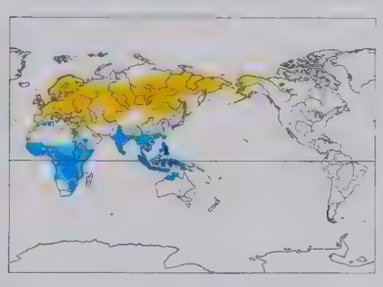
cm 10

60. Yellow Wagtail

Motacilla flava

French: Bergeronnette printanière **German**: Schafstelze **Spanish**: Lavandera Boyera
Other common names: Yellow(ish)-crowned Wagtail (*flavissima*); Grey-headed/Dark-headed Wagtail (*thunbergi*); Blue-headed (Yellow) Wagtail (*flava*); Iberian/Spanish (Yellow) Wagtail (*iberiae*); Ashy-headed Wagtail (*cinereocapilla*); Egyptian Yellow Wagtail (*pygmaea*); Black-headed Wagtail (*feldegg*); (Eastern) Yellow-headed/Yellow-browed Wagtail (*lutea*); Sykes's Wagtail (*beema*); White-chinned Wagtail, Turkestan Black-headed Wagtail (*melanogrisea*); Alaska (Yellow) Wagtail (*tschutschensis*); White-headed Wagtail (*leucocephala*); Green-crowned/Green-headed/Kuril (Yellow) Wagtail (*taivana*); Short-tailed Grey-headed Wagtail, Siberian (Yellow) Wagtail (*simillima*)

Taxonomy. *Motacilla flava* Linnaeus, 1758, southern Sweden.
Relationships uncertain. Has been thought to form a superspecies variously with *M. citreola*, or with *M. capensis*, or with those two together with *M. flaviventris*, but recent molecular-genetic studies indicate that none of these arrangements is tenable. Taxonomy complex, and much further research needed. Recent studies, using mitochondrial DNA, suggest that races may represent three separate species, one in NE (based on *tschutschensis*), another in extreme SE (based on *taivana* and *macronyx*), and a third in W & C (based on nominate race); moreover, they also indicated that the NE group was closest to E nominate form of *M. citreola* and the SE group closest to W race (*werae*) of latter; other researchers, however, consider those two races of *M. citreola* to be inseparable in terms of morphology. In addition, several races (especially *lutea*, *feldegg* and *taivana*) have often been treated as separate species by various authors. Taxonomy is further complicated by the fact that some races are known to hybridize on fairly regular basis, thus confusing the picture with regard to distributional limits. Race *plexa* is perhaps indistinguishable from *thunbergi*; *simillima* possibly better included in *tschutschensis*, and *angarensis* in latter or in *macronyx*; and *melanogrisea* possibly inseparable from *feldegg*. Race *alakulensis* (from SE Kazakhstan) synonymized with *thunbergi*, *alascensis* (W Alaska) with *tschutschensis*, and *aralensis* (Aral Sea) and *raddei* (Transcaspia) with *feldegg*; proposed race *zaissanensis* (L Zaisan, in E Kazakhstan) is apparently an intergrade or hybrid form, and other suggested races *superciliaris*, *dombrowskii* and *perconfusus* similarly represent inter-racial hybrids. Pending further research, and bearing in mind above-mentioned details, all forms traditionally considered to belong in present species are treated as such and listed below. Seventeen subspecies currently recognized.
Subspecies and Distribution.
M. f. flavissima (Blyth, 1834) - breeds Britain and adjacent coastal Europe; winters Africa.
M. f. thunbergi Billberg, 1828 - breeds Scandinavia E to NW Siberia; winters mainly sub-Saharan Africa and across S & SE Asia.
M. f. flava Linnaeus, 1758 - breeds N & C Europe (S from S Scandinavia) E to Urals; winters sub-Saharan Africa.
M. f. iberiae Hartert, 1921 - breeds Iberia, SW France and NW Africa (S to islands of Banc d'Arguin, in Mauritania); winters W & NC Africa.
M. f. cinereocapilla Savi, 1831 - breeds Italy (including Sardinia and Sicily) and Slovenia; winters Mediterranean coast and CW Africa (Mali E to L Chad).
M. f. pygmaea (A. E. Brehm, 1854) - resident in Egypt (delta and S along R Nile).
M. f. feldegg Michahelles, 1830 - breeds SE Europe (former Yugoslavia E to S Ukraine), S to Turkey, E Mediterranean, Iraq, W Caspian, Iran and Afghanistan; winters Africa (mainly Nigeria E to Sudan and Uganda).
M. f. lutea (S. G. Gmelin, 1774) - breeds SW Russia (between lower R Volga and R Irtysh, S from Kazan' and Perm') and N Kazakhstan (E to L Chany and L Zaysan); winters Africa and Indian Subcontinent.
M. f. beema (Sykes, 1832) - breeds from upper R Volga E to SW Siberia, S to N Kazakhstan and Altai Mts, also W Himalayas (Ladakh, possibly also N Kashmir); winters mainly Indian Subcontinent, also Arabia and E Africa.
M. f. melanogrisea (Homeyer, 1878) - breeds Volga delta and SW Kazakhstan S to NE Iran and Afghanistan; winters mainly S Asia E to W Nepal, possibly also NE Africa.
M. f. plexa (Thayer & Bangs, 1914) - breeds N Siberia (R Khatanga E to R Kolyma); winters India and SE Asia.
M. f. tschutschensis J. F. Gmelin, 1789 - breeds NE Siberia and extreme NW North America (N & W Alaska, extreme NW Canada); winters mainly SE Asia (E to Philippines, S to Indonesia).
M. f. angarensis (Sushkin, 1925) - breeds S Siberia and W Transbaikalia S to N Mongolia; winters SE Asia (Myanmar and Thailand E to SE China).
M. f. leucocephala (Przevalski, 1887) - breeds NW Mongolia, extreme NW China (N Xinjiang) and adjacent parts of former USSR; winters probably mostly in India.
M. f. taivana (Swinhoe, 1863) - breeds SE Siberia, Amurland, Sakhalin and N Japan (N Hokkaido); winters Myanmar, S China and Taiwan S to Greater Sundas, Philippines and Wallacea.
M. f. macronyx (Stresemann, 1920) - breeds SE Transbaikalia E to Amurland and Ussuriland, S to NE Mongolia and C Manchuria; winters SE Asia S to Malay Peninsula and SE China.
M. f. simillima Hartert, 1905 - breeds Kamchatka, N Kurils and Commander Is, and possibly Pribilofs and Aleutian Is; winters SE Asia and Philippines S to Sundas and Wallacea, and N Australia.



Descriptive notes. 16·5 cm; male 12·3-26·4 g, female 11·2-22·6 g, much variation with season, time of day and locality. Male nominate race in breeding plumage has blue-grey forehead to nape and hindneck, often somewhat darker ear-coverts, long narrow white supercilium from bill base to nape side, dark stripe through eye, thin whitish submoustachial stripe; upperparts greenish-tinged olive-brown; remiges blackish, tertials fringed yellow or buffy white, wing-coverts blackish, fringed and tipped greenish-yellow (two wingbars); tail brownish-black, fringed olive, outer two feather pairs wholly or largely white; chin, throat and underparts bright yellow, some green on breast side and flanks, sometimes an indistinct olive or greenish necklace; underwing-coverts white; iris dark brown; bill greyish to black; legs slate-grey to black. Male non-breeding plumage is similar to breeding female, browner above, yellower rump, wingbars less contrasting, dark necklace more obvious. Female in breeding plumage has duller, less contrasting head pattern, greyish or grey-brown crown, brownish cheeks, upperparts browner, less yellow; paler and less uniformly yellow below, especially throat, breast buffish and variably spotted dark brown, often forming necklace. Non-breeding female is duller than male, paler below, often with more obvious necklace. Immature resembles non-breeding female, may be greener above. Races vary mainly in colour and pattern of head of breeding male, whereas females and immatures often very difficult to assign to race (even when seen together in non-breeding areas): *flavissima* male has bright yellow head, more olive on hindcrown, nape, hindneck and ear-coverts, female is darker, browner, above and paler yellow below than nominate; *lutea* male has whole head yellow, female is similar to previous; *iberiae* male resembles nominate but has chin and throat white, not yellow, female has darker cheeks and whiter chin; *cinereocapilla* male is like previous but white supercilium absent or inconspicuous, female resembles previous; *pygmaea* male has dark grey crown and ear-coverts, white chin and throat, lacks supercilium, female is similar to last; *beema* male resembles nominate but forehead, crown, hindneck and ear-coverts pale ash-grey and supercilium broader, female has broader and longer supercilium; *leucocephala* male has white head except for yellow centre of throat and sometimes greyish hindneck, female variable, resembles either nominate or previous; *thunbergi* male has dark slate-grey forehead, lores, forecrown and ear-coverts shading to dark blue on hindcrown to hindneck, yellow centre of chin and throat, some birds with white rear supercilium and some with white stripe below ear-coverts, female differs from nominate in having darker crown, cheeks and upperparts, less obvious supercilium and darker necklace; *plexa* male has darker ear-coverts and lores and is more greyish on mantle than previous, female resembles dull male or is like nominate but darker; *tschutschensis* male differs from last in paler grey head, long white supercilium, sometimes blackish ear-coverts, female is variable, sometimes as nominate but with darker and greyer ear-coverts, or like dull male; *simillima* male differs from last in being brighter yellowish-green above, brighter below and generally lacking necklace, female resembles last; *angarensis* male has dark slate-grey crown and loral stripe, slate-black ear-coverts, narrow white supercilium, female resembles previous; *macronyx* male differs from previous in paler ear-coverts, no supercilium, brighter green mantle, deeper yellow underparts, more conspicuous wingbars, female is similar but duller or like nominate but darker and without supercilium; *taivana* male has long, broad deep yellow supercilium, dark ear-coverts and lores, yellow throat, dull greenish crown, nape and upperparts, female is variable, similar to washed-out male, with greenish-brown ear-coverts, paler and slightly narrower supercilium; *feldegg* male has glossy jet-black from forehead to hindneck and down to ear-coverts, sharply demarcated from yellow chin and throat, yellow-tinged wingbars, female has black mottling on head; *melanogrisea* male resembles last but has white stripe separating yellow throat from black cap, upperparts brighter green, sometimes an indistinct olive or greenish necklace, female is similar to last. Voice. Song, from perch (often bush or fence post) or in flight, a very brief trill or twitter of 2-3 notes, e.g. "srrii-srrríť". Call a shrill, drawn-out monosyllabic "tsweep", "chreep", "tseer" or "psie", occasionally disyllabic "tsi-weep", "sree-sreeh" or "tuwiet wheet". Some variation in both calls and songs among races, e.g. *feldegg* call harsher "szrrie".
Habitat. Variety of damp or wet habitats with low vegetation, from damp meadows, marshes, waterside pastures, sewage farms and bogs to damp steppe and grassy tundra; also large clearings in forest in N of range. In non-breeding season uses similar habitats, especially pasture and damp grassland, also cultivations; roosts in reedbeds and similar tall vegetation. Most races forage primarily in damp grassland or on relatively bare open ground at edges of rivers, lakes and other wetlands, but also in dry grassland and cereal crops; often feeds around herds of cattle and other large mammals, especially when on migration and in non-breeding season, and in African winter quarters associates with herds of game in rather open acacia (*Acacia*) savanna. Some differences in habitat preferences among races: *feldegg*, for example, favours swamps, lakesides and other wet places in winter quarters in Africa, and in Ethiopia often associated with edges of streams and rivers with fast-flowing water, whereas nominate race then occurs in drier habitats with grazing stock or game. Mainly lowlands to c. 1000 m, but in Caucasus locally up to 2500 m; breeds at 3600-4500 m in Ladakh.
Food and Feeding. Diet includes wide variety of terrestrial and aquatic invertebrates; also some plant material, especially seeds. Invertebrates range from small flies (Diptera), bugs (Hemiptera), beetles (Coleoptera), grasshoppers (Orthoptera), butterflies (Lepidoptera), cockroaches (Blattodea), termites (Isoptera) and ants (Hymenoptera) to crustaceans; dragonflies (Odonata) sometimes important by mass. In African winter quarters, sample of stomach contents dominated in terms of bulk by adult beetles 3-5 mm long, and larvae of beetles and lepidopterans present in small numbers; bugs, beetles, ants and grasshoppers were numerically the most important prey in another study. Small flies were found to be most important elsewhere, as at L Chad and L Victoria. Some berries, e.g. from saltbush (*Salvadora persica*), and other plant material also taken. Forages by picking items from the ground or from water while walking; also run-picks, and makes short flights to catch insects in the air, over water or from vegetation. Occasionally hover over vegetation to take prey. Frequently associates with domestic stock, especially cattle, both in summer and in winter, also with wild game in winter quarters; takes advantage of insects attracted by the animals and their dung and disturbed by their grazing activity. Often in small to large or very large flocks outside breeding season; single individuals often defend a feeding territory throughout winter, and small flocks may also do so.
Breeding. Apr-Aug, varying with latitude; 1-2 broods. Monogamous; solitary, territorial breeder. Nest, built mainly by female, a grass cup lined with hair, placed on or close to ground in shallow scrape. Clutch 4-6 eggs; incubation by both sexes, female taking greater share, period 11-13 days; chicks fed by both parents, nestling period 10-14 days; fledglings remain with parents for several weeks. Nests sometimes parasitized by Common Cuckoo (*Cuculus canorus*). Adult seen to feed Crested Lark (*Galerida cristata*) fledgling in S France.
Movements. Almost wholly migratory; resident in Egypt (*pygmaea*), probably at least partially so also in NW & W Africa (*iberiae*). W populations winter throughout sub-Saharan Africa, *flavissima* and *iberiae* mainly in W, *lutea* in E; some (especially *cinereocapilla*) also remain around Mediterranean region. C & E populations migrate mainly to S Asia, some (e.g. *beema*) also to Africa; those in far E of range (*tschutschensis*, *simillima*) move as far S as the Sundas, with *simillima* regularly reaching N Australia. Races mix freely in non-breeding quarters, and N race *thunbergi* found in non-breeding season from Africa across to SE Asia. Departure from breeding grounds mainly Aug-Oct, from Jul in N, reaching winter quarters mostly in Oct; return begins Feb, some not leaving until end Apr, arrival in breeding areas Mar-May, in N sometimes not until early Jun; large passage involving at least five races through Middle East, from late Aug (*feldegg*) to Oct (*lutea*) and in spring from mid-Feb (*feldegg*) to May (*thunbergi*, *lutea*). Migrates diurnally, in flocks; adults and offspring may migrate together, although males reported as leaving wintering grounds earlier than females, and males were earlier migrants than females on four Italian islands; adult males may arrive before yearling males.
Status and Conservation. Not globally threatened. Locally common to very common; uncommon in some regions, and status of some races uncertain. Estimated European population over 7,000,000 breeding pairs; very large roosts in winter quarters, e.g. one in Nigeria estimated to contain 50,000

On following page: 61. Citrine Wagtail (*Motacilla citreola*).

individuals. Declines reported between 1970 and 1990 in 13 countries in Europe, involving mainly nominate race and *flavissima*; increases recorded in Sweden and Slovenia, and stable populations in 16 other countries. In Britain, marked decline (9·4%) noted between breeding survey in 1968-72 and that in 1998-1991. Declines have been linked with agricultural intensification, especially drainage of wetlands in floodplains and replacement of grassland with cereals; in some areas, as in E Britain, this species does breed in root crops and cereals, but at lower densities than in prime floodplain habitats. Drainage, use of pesticides and dumping of manure may have caused declines in Continental Europe. Few comparable data from other parts of range; common resident in Egypt (*pygmaea*). Recently discovered breeding in C Saudi Arabia (*feldegg*). In African winter quarters, migrants thought to be vulnerable to chemical spraying of Red-billed Quelea (*Quelea quelea*) roosts in trees or reedbeds where wagtails also roost.

Bibliography. Adamian & Klem (1999), Ali (1969), Ali & Ripley (1998), Alström & Mild (2003), Amat (1998), Anon. (1998a), Archer & Godman (1937-1961), Armstrong (1983), Ash & Miskell (1998), Ash *et al.* (1967), Aymí (1999), Badyaev *et al.* (1998), Baicich & Harrison (1997), Barlow *et al.* (1997), Bartrolí (1991), Beehler *et al.* (1986), Bell (1996a, 1996b), Benson & Benson (1977), Benson *et al.* (1971), Beregovoi (1971), van den Berg & Oreel (1985), Berthold (2001), Blakers *et al.* (1984), Bonaccorsi (2002), Borrow & Demey (2001), Bradbury & Bradter (2004), Brazil (1991), Broadbent (1969a), Brosset (1971), Christidis & Boles (1994), Clancey (1964b, 1980), Coates (1990, 2001), Coates & Bishop (1997), Corso (2001), Cramp (1988), Curry-Lindahl (1958, 1963), Danielsen *et al.* (1994), Dementiev *et al.* (1970), Dierschke (1994), van Dijk (1975), Dowsett (1965), Dubois (2001), Elgood *et al.* (1966), Étchécopar & Hüe (1983b), Evans, Dutson & Brooks (1993), Fry *et al.* (1972), Gibbons *et al.* (1993), Ginn *et al.* (1989), Goodman *et al.* (1989), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Heinroth & Steinbacher (1952), Herremans (1992), Hou Lanxin & Jiang Wei (2003), Hura (1999), Kaufman (1996), Keith *et al.* (1992), Kennedy *et al.* (2000), Keve (1978), Kukish & Noskov (1976), Lekagul & Round (1991), Ma Ming *et al.* (2000), Mackworth-Praed & Grant (1960, 1962), Maclean (1993a), van Marle & Voous (1988), Marshall & Williams (1959), Mason & Lyczynski (1980), McClure (1998), Morcombe (2000), Nechaev & Kurenkov (1983), Pakenham (1979), Paulsen (1978, 1993a, 1993b), Pavlova *et al.* (2003), Pearson (1971b), Pearson & Backhurst (1973), Penry (1994), Pérez-Tris & Asensio (1997), Porter (1983), Rand & Gilliard (1967), Riley (1997), Ripley (1982), Roberts (1992), Sangster, Hazevoet, Van den Berg & Roselaar (1998), Sangster, Hazevoet, Van den Berg, Roselaar & Sluys (1999), Serle *et al.* (1977), Siblet & Tostain (1984), Simmons (1994), Skerrett *et al.* (2001), Smith (1950), Smith & Ebbutt (1965), Smythies (1986, 1999), Snow & Perrins (1998), Spina & Massi (1992), Spina *et al.* (1995), Stiebel (1997), Surmacki *et al.* (1999), Valkiūnas & Iezhova (2001), Vaurie (1957b), Verroken & Verroken (1991, 1995), Voelker (2002), Voous (1950), Ward (1963, 1964), White & Bruce (1986), Wood (1975, 1976, 1978, 1979, 1982, 1992), Yang Guisheng & Xing Lianlian (2000), Yesou (1992), Zheng Guangmei & Zhang Cizu (2002), Zink (1973-1985).

61. Citrine Wagtail

Motacilla citreola

French: Bergeronnette citrine **German**: Zitronenstelze **Spanish**: Lavandera Cetrina
Other common names: Yellow-headed/Yellow-hooded Wagtail

Taxonomy. *Motacilla citreola* Pallas, 1776, Siberia.

Has been thought to form a superspecies with *M. flava*, or with that species together with *M. capensis* and *M. flaviventris*, but such relationships not supported by recent molecular-genetic studies. Recent research, using mitochondrial DNA, suggests that W race *werae* may represent a separate species, closer to SE Asian races of *M. flava* and distinct from nominate E race, which appears closer to NE races of latter; others, however, consider *werae* to be morphologically and vocally inseparable from nominate. Further study needed. Races intergrade. Proposed race *quassitrix* (described from S Russian Altai) considered indistinguishable from nominate, and *sindzianicus* (N Xinjiang, in NW China) from *werae*; *weigoldi* (from N Sichuan, in C China) synonymized with *calcarata*. Three subspecies recognized.

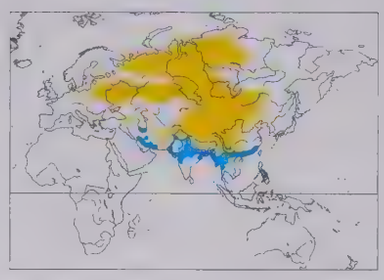
Subspecies and Distribution.

M. c. citreola Pallas, 1776 - breeds N Europe (Finland, N Russia) E to C Siberia, Transbaikalia, Mongolia and NW Manchuria; winters mainly Indian Subcontinent, also SE Asia.

M. c. werae (Buturlin, 1907) - breeds E Europe (S Baltic Republics, E Poland), Belarus and Ukraine E to Russian Altai, N & E Kazakhstan and NW China (NW Xinjiang); winters Indian Subcontinent and SE Asia.

M. c. calcarata Hodgson, 1836 - breeds E Iran, Afghanistan, and C Asian mountains from Tien Shan E to C China (E to C Gansu and Sichuan) and S to N Himalayas; winters lowlands from S Afghanistan E to Myanmar.

Descriptive notes. 16·5-20 cm; 18-25 g. Male nominate race in breeding plumage has bright yellow head and underparts, black lower hindneck and upper mantle, black extending slightly onto breast side; lower mantle and scapulars dark grey, tinged olive, rump dark slate-grey, uppertail-coverts black; remiges and greater and median wing-coverts dark brown to black with pale edgings, white covert tips forming two wingbars, lesser coverts dark olive-grey; tail mostly black, outer two feather pairs mainly white with black bases; yellow of underparts washed olive-grey on side of



breast and flanks, sometimes blackish spots on breast side, undertail-coverts yellowish-white; iris dark brown; bill black; legs black or blackish-brown. Non-breeding male is duller, hindcrown to mantle and scapulars dark olive-grey to grey, sometimes some dark mottling above, yellow areas paler. Female resembles non-breeding male; non-breeding female is duller, greyer above, yellow areas paler, grey on side of breast and flanks, whiter on belly. Immature has little or no yellow in plumage, is more buff and more grey than non-breeding female, olive-brown on breast side and flanks. Races differ mainly in colour tones of breeding male, but much individual variation: *werae* male differs from nominate in having purer grey back with no dusky suffusion, paler below with less grey on flanks, female is similar to nominate, on average slightly smaller; *calcarata* male differs in having all-black upperparts, deeper yellow of head and underparts extending to undertail-coverts, edges of tertials broader and purer white, greater coverts often all white, often more black on inner webs of outer two rectrices, female is similar to nominate but may show diffuse blackish spots on mantle to rump, more blackish uppertail-coverts, has more yellowish-tinged undertail-coverts, on average longer bill and tarsus. Voice. Song, from bushtop or in flight, 2-4 simple notes, first note often sharper, repeated in phrases separated by several seconds; rather similar to that of *M. flava* or *M. alba*. Call a distinctive wheezy or husky, rather harsh "peep", "zeet", "dzeep" or "drreeep" or disyllabic "tit tit"; also higher-pitched and less rasping "pzeeoow".

Habitat. Favours marshes, edges of lakes, willow (*Salix*) thickets and wet rough grassland in tundra, also areas of willow bushes on mountain meadows and sometimes in fields near villages. In non-breeding season similarly wet habitats, including also coastal marshes, brackish lagoons, sewage farms and irrigated land, wet paddyfields, lake margins and riverine sandbars; in Nepal favours wetter areas than those used by *M. flava*. Breeds from sea-level to 4600 m.

Food and Feeding. Food includes wide variety of invertebrates, often aquatic, and their larvae; recorded items include, among others, nymphs and adults of dragonflies (Odonata) and beetle larvae (Coleoptera), adult and larval flies (Diptera), and spiders (Araneae). Forages by picking and darting for prey; takes items from the ground, from low vegetation or from water surface. Walks on open wet ground at edge of water and on floating mats of aquatic vegetation such as water hyacinth (*Eichhornia*); wades in shallow water. Will also flutter up to snatch an insect in air.

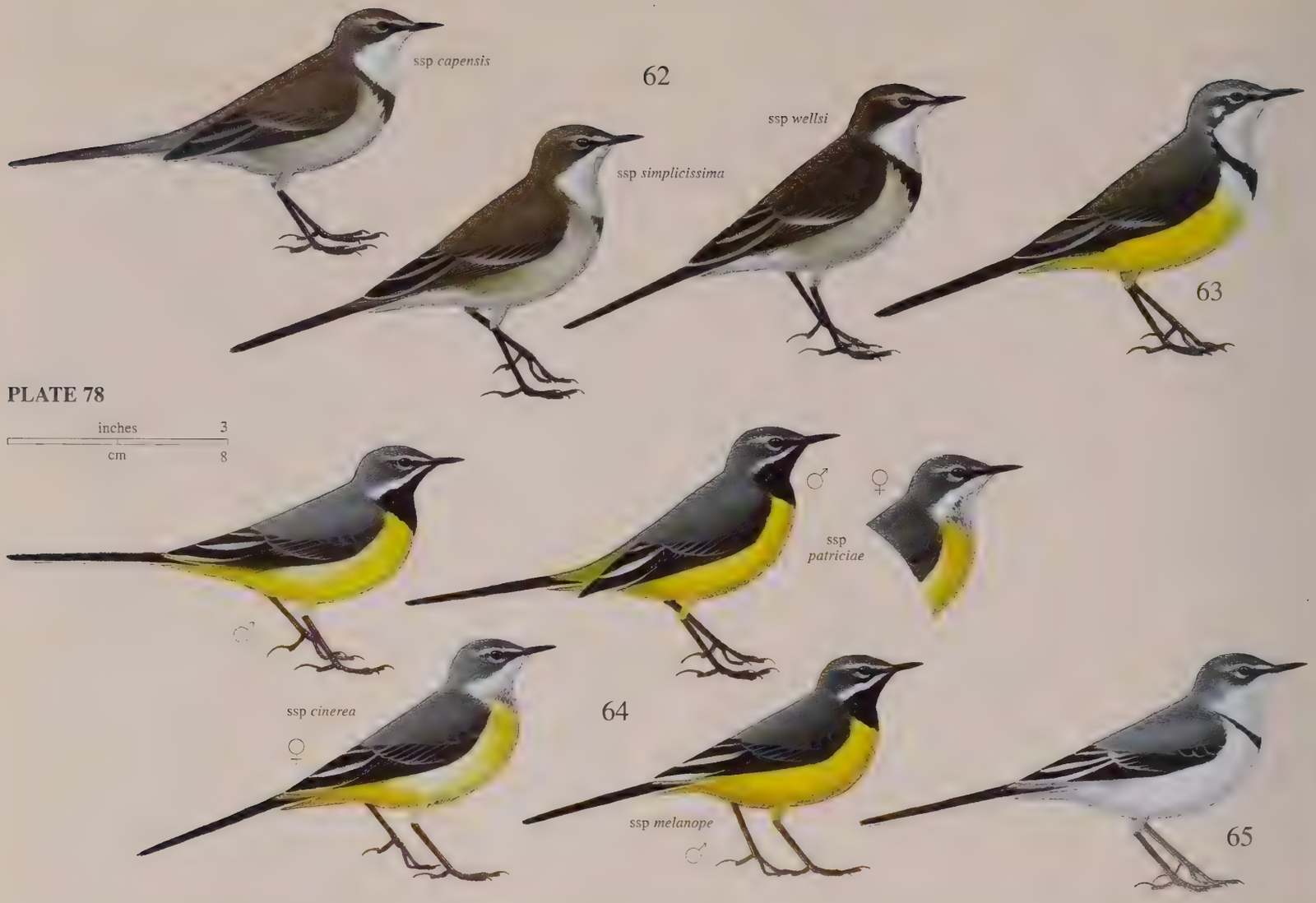
Breeding. Late Apr-Jun, later in N, and May-Aug in SE (*calcarata*); often two broods. Monogamous; territorial, but may nest semi-colonially. Nest, built by female, a cup of moss and plant leaves and stems, lining of hair, wool and feathers, placed on ground in grassy vegetation. Clutch 3-6 eggs, occasionally 7; incubation by both sexes, period 14-15 days, in Poland 11-12 days; nestling period 10-13 days, sometimes up to 15 days. For 28 nests in Poland, hatching success 55·3%, fledging success 38·1%, average of 1·8 young reared per nest.

Movements. Migratory. Winters in Indian Subcontinent (except S & E) and in SE Asia, smaller numbers also S shores of Caspian Sea and N Persian Gulf; occasional winterer in Middle East. Regularly recorded during spring migration in Israel and also in Oman, which may indicate that a wintering area exists in Africa; at least 15 records from Africa (Egypt, Sinai, Morocco, Djibouti, Ethiopia and Cameroon), and one straggler reached South Africa in Apr-May 1998. Occasionally occurs E to Japan. Increasingly recorded as a vagrant in W Europe since 1980. S migration mainly Aug-Oct; return N from Mar, arrival in breeding areas Mar-May, in N Siberia not until Jun. Migrates and winters in flocks; sometimes roosts together with *M. flava*, as in S Nepal (Chitwan).

Status and Conservation. Not globally threatened. Very common in tundra belt of N Russia, less common farther S; estimated total population in European Russia over 300,000 pairs. Density in preferred habitat in Ukraine 0·3-0·5 pairs/ha. In recent decades has extended its range to W & SW; regular breeder in Ukraine since 1976, breeding first reported in Belarus in 1982, in Lithuania in 1987, in Estonia in 1991, in Latvia in 1993 (six pairs in 1998), and in Finland and N Poland since 1990s; has bred in Germany and the former Czechoslovakia, and in Armenia.

Bibliography. Ali (1996), Ali & Ripley (1998), Ali *et al.* (1996), Alström & Mild (2003), Ananian & Busuttil (2002), Andersen *et al.* (1993), Anon. (1998c), Barthel (1990), Bergmanis (1984), Brazil (1991), Brewka *et al.* (1988), Carey *et al.* (2001), Christidis & Boles (1994), Cox & Inskipp (1978), Cramp (1988), Deignan (1945), Dementiev *et al.* (1970), Demey (1998), Duckworth *et al.* (1999), Edqvist (1979), Étchécopar & Hüe (1983b), Grimmett *et al.* (1998), Hadarics (1996), Hagemeijer & Blair (1997), Heath & Evans (2000), Heath *et al.* (2000), Hirschfeld (1995), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Keith *et al.* (1992), Lekagul & Round (1991), Ma Ming *et al.* (2000), Mason & Lyczynski (1980), McClure (1998), Mukherjee (1995), Pavlova *et al.* (2003), Paz (1987), Pizzey & Doyle (1980), Pranaitis (1990), Ripley (1982), Roberts (1992), Robson (2000), Rogacheva (1992), Schultz (1998), Sciborska (2004), Shirihai (1990, 1996), Smythies (1986), Snow & Perrins (1998), Stepanyan (1990), Svensson (1977), Voelker (2002), Walker (1981a), Wilson, M.G. (1984), Yang Guisheng & Xing Lianlian (2000), Zhang Xiaoai & Deng Heli (1992), Zheng Guangmei & Zhang Cizu (2002).

PLATE 78 ➤



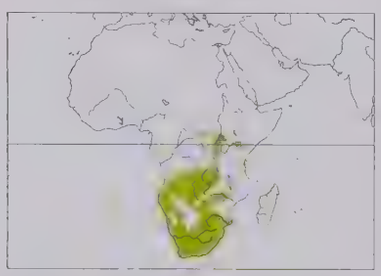
62. Cape Wagtail

Motacilla capensis

French: Bergeronnette du Cap **German**: Kapstelze **Spanish**: Lavandera de El Cabo
Other common names: Angolan Wagtail (*simplicissima*); Wells's Wagtail (*wellsi*)

Taxonomy. *Motacilla capensis* Linnaeus, 1766, Cape of Good Hope, South Africa.
Sometimes thought to form a superspecies with *M. flaviventris*; both also suggested as comprising a superspecies with *M. flava* and *M. citreola*, but such a relationship is not supported by recent molecular-genetic studies. Race *simplicissima* sometimes treated as a separate species. Proposed races *bradfieldi* (from W Namibia) and *beirensis* (S Mozambique) included in nominate. Three subspecies recognized.

Subspecies and Distribution.
M. c. wellsi Ogilvie-Grant, 1911 - E DRCongo E to SW Uganda and NW Tanzania, and W & C Kenya.
M. c. simplicissima Neumann, 1929 - Angola E to SE DRCongo, S to NE Namibia, N Botswana and Zambia, and W Zimbabwe (on R Zambezi).
M. c. capensis Linnaeus, 1766 - W & S Namibia, SE Botswana, much of Zimbabwe and W & S Mozambique S to S South Africa.



Descriptive notes. 17-20·5 cm; 17-25 g. Adult nominate race has narrow buffy supercilium, dark brown to black lores; above, mainly dark olivaceous grey, wing feathers blackish-brown with buffy or grey edges; tail brownish-black, T3-4 edged and tipped white, T5-6 mostly white; chin and throat creamy; dusky pectoral band, broader in centre, breast side and flanks olive-grey, centre of lower breast and belly yellowish or creamy white, undertail-coverts white; axillaries grey, underwing-coverts whitish; iris dark brown; bill black; legs blackish. Sexes alike. Immature is warm brown above, wing-coverts tipped pale buff, underparts washed with pale yellow, has shorter tail than adult. Race *simplicissima* has more olivaceous upperparts than nominate, yellower wash on underparts, breastband reduced to an irregular spot in centre of breast; *wellsi* has darker upperparts than others, well-defined blackish pectoral band, pinkish wash below. Voice. Song a jumble of twittering notes, "tweep tweep tweep, witititi, cheep-tweep", sometimes containing phrases similar to those of a finch (Fringillidae). Call a loud, liquid, high-pitched "tseeep" or "tweep" or disyllabic "tseep-eep" or "weeep tèdèdjèj"; also drawn-out trisyllabic whistle.

Habitat. In S occurs near any sort of water, so long as open ground nearby; found around houses and gardens, farms, villages, on large areas of lawn in towns and villages, as well as by tree-lined rivers, small slow-moving streams, floodlands and pastures, dunes and both sandy and rocky coasts. In N (N of R Limpopo) much less urban, preferring wetland edges, sides of slow-moving streams, rivers and ditches, muddy edges of pools and reservoirs, sewage farms, watered lawns around houses, but also cultivations, grassland and forest clearings, to 3000 m. Occurs above 2000 m in highlands of Kenya. Communal roosts containing up to 100 individuals in reedbeds or in trees, often in busy city centres, outside breeding season.

Food and Feeding. Diet mainly insects, including flies (Diptera), often midges (Chironomidae) and mosquitoes (Culicidae) and their larvae, larval and adult moths and butterflies (Lepidoptera), beetles (Coleoptera), ants (Hymenoptera), and dragonflies and their nymphs (Odonata); also termites (Isoptera). Also crustaceans such as sandhoppers (Talitridae) and small crabs, snails (Mollusca), tadpoles and small fish; ticks (Acarina) also eaten. Household scraps, ranging from raw meat and suet to bread, cake, cheese and hard-boiled eggs, readily taken. Forages on wet mud and moist grassland, often feeding among cattle. Foraging usually involves walking and picking or darting after insects on the ground, also wading in shallow water and picking at prey in or over the water; jumping up into the air for insects. Occasionally makes short aerial sallies from trees in manner of *M. cinerea* or a flycatcher (Muscicapidae). Singly, in pairs or in family groups; in non-breeding months also in loose flocks of up to 50 individuals.

Breeding. Mar, Jun-Sept and Nov-Dec in Uganda, Jan, Apr-May, Jul and Sept in Kenya, and Jul-Aug in Zambia; lays in most months in S, season Aug-Dec (mainly Sept-Oct, occasionally Feb) in Zimbabwe, and in South Africa mostly Sept-Nov in N and Jul-Jan in E; up to six broods in a season. Monogamous, permanent pair-bond; solitary and territorial. Nest, built by both sexes, a cup of grass, rootlets and leaves, lined with finer rootlets, cattle hair and sometimes wool or feathers, concealed in vegetation on ground or in low vegetation, occasionally up to 6 m above ground in tree, bush or creepers, generally over or close to water. Clutch 1-4 eggs, exceptionally 5-7; incubation by both sexes, period 12-14 days; chicks fed by both sexes, nestling period 15-16 days; juveniles fed by both parents for 3-4 weeks after fledging, injury-feigning display by adults when newly fledged young present. Nests regularly parasitized by Red-chested Cuckoo (*Cuculus solitarius*) and Diederik Cuckoo (*Chrysococcyx caprius*).

Movements. Largely sedentary; some wandering in parts of E Africa, and in parts of South Africa and Zambia possibly a long-distance altitudinal migrant or partial migrant. Post-breeding dispersal or hard-weather movements may account for observed increases in numbers at some places in dry winter months; marked influx in Botswana during dry season, suggesting regular seasonal movement. Outside the breeding season may form flocks, and roosts communally (up to 100 birds) in reedbeds or in trees, often in busy city centres

Status and Conservation. Not globally threatened. Frequent and widespread; most common in parts of S. In E Africa common in SW Uganda, but scarce in E DRCongo, Rwanda, Burundi and N Tanzania; local and uncommon in Kenyan Highlands. In South Africa, density on R Little Caledon (Free State) 3·2 pairs/10 km, and total of 21 pairs along 65 km of river; 31 counted in the intertidal zone on Dassen I (off Western Cape) in Nov. Sometimes concentrated in a small area, e.g. a few hundred pairs found in relatively small area around freshwater pools at Sandwich Harbour (Namibia). Population in S Africa decreased in 1950s and 1960s as a result of insecticide use, but has since recovered. Has probably benefited from creation of artificial environments, such as parks, garden lawns, sewage farms and dams.

Bibliography. Anon. (1979), Beel (1992), Begg (1981), Benson *et al.* (1971), Berry (1980), de Boer & Bento (1999), Brewster & Tyler (2002), Bunning (1998), Clancey (1963, 1964b, 1996), Dean (2000), Earlé (1986e), Every (1973), Furlong (1999), Ginn *et al.* (1989), Godfrey (1925), Hanson (1999), Harrison *et al.* (1997), Herholdt (1986b), Hewitt (1964), Hockey *et al.* (1989), Irwin (1960, 1981), Jensen & Vernon (1970), Johnson & Maclean (1994), Keith *et al.* (1992), Kopij (1997), Lewis & Pomeroy (1989), Mackenzie (1982), Mackworth-Praed & Grant (1960, 1962), Milton & Dean (1999), Neumann (1929), Nevill (1984b), Oatley (1988, 2002b), Oschadleus (1996), Parker (1999), Parker & de Boer (2000), Penry (1994), Prozesky (1963), Rowan (1983), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Skead (1954), Stevenson & Fanshawe (2002), Steyn (1996), Tarboton (2001), Underhill (1992), Van Ee (1963), Venter (1999), Voelker (1999c, 2002), Wilson (1999), Winterbottom (1959a, 1968).

63. Madagascar Wagtail

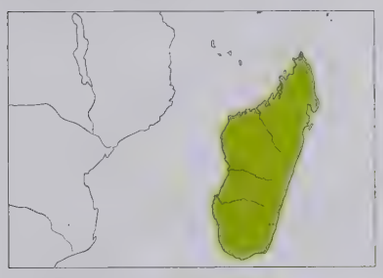
Motacilla flaviventris

French: Bergeronnette malgache **German**: Madagaskarstelze **Spanish**: Lavandera Malgache

Taxonomy. *Motacilla flaviventris* Hartlaub, 1860, Bombetoke Bay, Madagascar.

Sometimes thought to form a superspecies with *M. capensis*; both also suggested as comprising a superspecies with *M. flava* and *M. citreola*, but such relationship not supported by recent molecular-genetic studies. Described race *icterica* (SC Madagascar) considered indistinguishable from other populations. Monotypic.

Distribution. Madagascar.



Descriptive notes. 19 cm. Large wagtail with narrow black breastband. Male has grey crown and nape, prominent narrow white supercilium, dark grey eyestripe and moustachial stripe; rest of the head grey, small white crescent under eye, whitish spot on ear-coverts; upperparts mouse-grey, more olive on rump and uppertail-coverts; wings blackish-brown, remiges white basally, tertials fringed white, whitish tips of greater wing-coverts (indistinct wingbar); tail blackish-brown, outer rectrix white; throat and underparts white, strongly washed lemon-yellow on belly and flanks, narrow black band on upper breast extending around throat side to join moustachial stripe; iris brown; bill blackish; legs dark grey. Female and immature are paler than male. Voice. Song, from ground or perch or in flight, a trisyllabic, slightly trilled melodious "tree treeoo", usually repeated several times, followed by melodic phrase; more complex song by presumed male when he brought food to female on nest. Call a buzzy "trrree trrree-oou", frequently repeated, sometimes followed by melodious "tsee-eee-wee-oo tsee-wee-oo", in flight, on ground or perched.

Habitat. Open areas near water, whether fresh, brackish or salt; typically, by lakes and rivers, in marshes, paddyfields and fish ponds, and on beaches. Also away from water in clearings in woodland, in secondary forest and gum (*Eucalyptus*) plantations, cultivated areas, and around dwellings in towns and villages. Sea-level to 2600 m.

Food and Feeding. Diet mainly small invertebrates, notably insects and spiders (Araneae). In brief study at one nest, caterpillars and moths (Lepidoptera), as well as unidentified insects, and a lizard, were brought to the nestlings. Food items obtained largely by picking while walking jerkily or running on the ground; sometimes flutters up to snatch an insect in air.

Breeding. Breeds Aug-Nov; two broods. Record of juvenile from first brood joining parents in feeding nestlings of second brood. Nest a typically bulky structure, with neater cup of twigs, stems and mosses and lining of finer material, built in low bush, fork of tree, rock crevice or depression in boulder, or under house roof, often near or over water. Clutch 3-4 eggs, usually 2; incubation by both sexes, period not documented; chicks brooded and fed by both parents, female may take larger share of brooding, male delivers more food to nest, feeds nestlings directly or passes food to mate for brood-feeding, nestling period at one nest 15-16 days; at same nest, male sang as he brought food, female then left nest and perched beside mate, latter displayed by cocking tail almost vertically and fluttering closed wings rapidly, then slightly spread wings while shaking the body and singing, female then left and male fed chicks.

Movements. Some internal movements occur, but details unknown. Appears to leave the High Plateau during austral winter, presumably moving down to lower-lying ground.

Status and Conservation. Not globally threatened. Common and widespread, occurring throughout Madagascar. Most common in E and on the High Plateau; less numerous in N & W, rare in S. Has possibly benefited from presence of humans; frequent around houses, even in well-populated areas, and utilizes artifical habitats for foraging and artificial structures (house roofs) for nesting.

Bibliography. Bangs (1918), Benson (1981), Benson *et al.* (1976-1977), Dee (1986), Greiner *et al.* (1996), Koenig (2002), Langrand (1995), Milon *et al.* (1973), Morris & Hawkins (1998), O'Daniel (1997), Rand (1936), Sinclair & Langrand (1998), van Someren (1947).

64. Grey Wagtail

Motacilla cinerea

French: Bergeronnette des ruisseaux **German**: Gebirgsstelze **Spanish**: Lavandera Cascadeña

Taxonomy. *Motacilla Cinerea* Tunstall, 1771, no locality = Wycliffe, Yorkshire, England.

Relationships uncertain. Sometimes thought to form a superspecies with *M. clara*; possibly closer to E forms of *M. flava*. Variation clinal, tail length decreasing gradually from W to E, and E individuals on average darker, but differences relatively minor and much individual variation: E races *melanope* and *robusta* possibly better merged with nominate. Similarly, birds from Turkey, Caucasus and Iran sometimes treated as race *caspica*, but appear indistinguishable from nominate. Six subspecies tentatively recognized.

Subspecies and Distribution.

M. c. cinerea Tunstall, 1771 - British Is and N, W & S Fennoscandia S through much of W Europe to Iberia and islands in Mediterranean Sea, NW Africa (Morocco, N Algeria), Turkey, Caucasus and N & SW Iran.

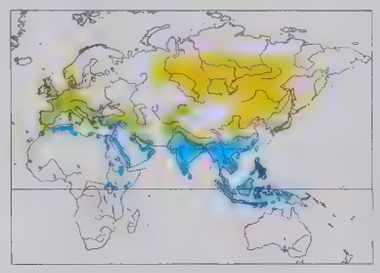
M. c. melanope Pallas, 1776 - breeds N Asia from Ural Mts E to C coast of Sea of Okhotsk, S to NW, N & E Mongolia and E China (S to S Gansu, S Shaanxi and Hebei); also in mountains from Tien Shan S to E Afghanistan and E along Himalayas; winters NE Africa and S & SE Asia.

M. c. robusta (C. L. Brehm, 1857) - breeds extreme E Asia from E Russia (S & C Kamchatka and Amurland) S to Korea and Japan; winters S to Sundas and New Guinea.

M. c. patriciae Vaurie, 1957 - Azores (Furnas, São Miguel).

M. c. schmitzi Tschusi, 1900 - Madeira.

M. c. canariensis Hartert, 1901 - Canary Is.



Descriptive notes. 17-20 cm; male 15-22 g, female 14-20 g. Distinctive; the only long-tailed wagtail with blue-grey upperparts and yellow uppertail-coverts and underparts. Male in breeding plumage has narrow white supercilium and eyering, black lores, white moustachial stripe; top and side of head grey, upperparts grey, olive-yellow rump and uppertail coverts, upperwing-coverts olive-grey; remiges black, inner ones edged white; long tail black, outer three rectrices white; chin and throat black, rest of underparts bright yellow; underwing grey, white bases of flight-feathers; iris dark brown; bill black; legs pinkish-brown or dark flesh-brown. Non-breeding male differs in having chin and throat white or buffy white, supercilium buffy. Breeding female differs from male in having chin and throat buffy white, mottled black, sometimes all black; non-breeding female differs from male in paler yellow underparts, more buff on breast. Immature is similar to non-breeding female, but pale markings more buff, dark markings more olive. Race *melanope* is somewhat darker and shorter tailed than nominate; *robusta* is marginally shorter-tailed than nominate, on average slightly darker above and deeper yellow below, with more extensive and deeper black on throat; *canariensis* is richer yellow (sometimes more orange-yellow) below, greenish-tinged on back, white markings on face and wings more contrasting; *patriciae* is darker grey above, particularly on cheeks, white supercilium only behind eye, shorter tail with less white on outer rectrix; *schmitzi* is similar to last, but has shorter bill, less black on tail. Voice. Song, in flight, a series of notes as "tzii-tz-tzi-tzi-tzee-ree-ree-ree", ending in trill, given as the male parachutes down from a tree or wires to the ground. Call a sharp "chittick", "tzitzi" or "si-heet", similar to that of *M. alba* but higher-pitched, more metallic and staccato; alarm a rising "sueet".

Habitat. Fast-flowing mountain streams and rivers with riffles and exposed rocks or shoals, often in forested areas; also more lowland watercourses, even canals, where there are artificial waterfalls, weirs, millraces or lock gates. In non-breeding season frequents wider variety of habitats, including farmyards, sewage farms, forest tracks, tea estates, and even town centres. Breeds at up to 4100 m in Himalayas.

Food and Feeding. Prey mainly insects, notably fly larvae and adults (Diptera, especially Chironomidae) and nymphal and adult mayflies (Ephemeroptera) and caddis flies (Trichoptera); some dragonflies (Odonata), moth caterpillars and adult butterflies (Lepidoptera), beetles (Coleoptera), lacewings and alderflies (Neuroptera), bugs (Hemiptera), grasshoppers (Orthoptera); freshwater shrimps (*Gammarus*), terrestrial snails (Mollusca) and spiders (Araneae) also eaten. In India, three stomachs contained 28 flies, 10 bugs, 7 grasshoppers, 6 beetles, 3 dragonflies and a spider. Of 944 prey items retrieved from nestlings in Czech Republic, 90% comprised flies, mayflies, stoneflies (Plecoptera) and beetles in equal proportions, while caddis flies and homopteran bugs each comprised just over 3%, and other items included insects (Lepidoptera, Hymenoptera, Orthoptera, Neuroptera), spiders, crustaceans and gastropod snails; almost 69% of food items were adult insects, but prey taken to nestlings varied according to weather. In a second study in Czech Republic, flies comprised 36% of 496 prey items, stoneflies 26%, homopterans 13·5% and caddis flies 8·5%; aquatic insect larvae represented less than 7% of nestling diet, although they were more important earlier in breeding season when there were more large larvae in the river (as the season progresses, the adults emerge). In C Asia, nestlings at L Baikal were fed a range of insect prey, as well as spiders and terrestrial molluscs, but 54% of items were, in order of abundance, mayflies, stoneflies, flies and caddis flies; in Tien Shan Mts mayflies, stoneflies and caddis flies dominated the nestling diet in late Jun and early Jul, accounting for 85% of food items, but comprised only 5·4% in late Jul, when dipterans (32·8%) were most important. Forages by walking and picking, run-picking, and flying up a short distance from ground to catch an insect; also makes flycatching sallies from a perch out over water, this technique being more frequent in summer months when temperatures are high and aerial insects more active. Also wades in shallow water to pick aquatic prey.

Breeding. End Mar to Aug, mainly from Apr, in Europe; late Mar to May in N Africa, early Mar to Jun in Canaries, lays from from late May in Azores; end Apr to early Jul in N Indian Subcontinent; frequently two broods, occasionally three. Monogamous; highly territorial, linear territory 200-1000 m or more. Male has parachuting display-flight, descends from tree or overhead wire, wings lowered and spread, tail depressed and yellow rump feathers conspicuously puffed up, singing until it reaches ground. Nest, built by both sexes, a typical platform and cup of coarser material, lining of finer grasses, root fibres and usually horse hair, placed on rock ledge or in crevice in riverbank, or often on ledge in wall, under bridge or in drainpipe. Clutch 3-7 eggs, usually 4-6; incubation by both sexes, female taking larger share, period 11-13 days; chicks fed by both parents, both also remove faecal sacs, nestling period 11-13 days; injury-feigning distraction display by adult when flushed from nest with young; young attended and fed by both parents for 2-3 weeks after fledging, sometimes by male alone if female soon lays a second clutch. In Europe, 42-63% of eggs produced fledged young, and productivity as high as 3·3 young per nest in Germany.

Movements. Island races and S populations resident; others partial or long-distance migrants. Nominate race winters in S parts of breeding range and in N Africa and coastal Arabia; some

On following page: 65. Mountain Wagtail (*Motacilla clara*).

continue S to W & E Africa, a few reaching DRCongo, Malawi and Tanzania, occasionally farther S (Zambia, Zimbabwe, Namibia, South Africa). E populations migrate to NE Africa and S Asia, winter widely from Indian Subcontinent E to SE China, and Taiwan and Philippines, race *robusta* extending S to Sundas and New Guinea (and recorded also in New Britain and Australia). Present throughout year in Japan. In many areas, individuals make short post-breeding movements to habitats that provide better foraging opportunities during winter months; for example, many descend from uplands to low-lying wetlands and farmland. Migrants leave breeding grounds from Aug onwards, often not until Oct; return in Mar-May.

Status and Conservation. Not globally threatened. Frequent and widespread in mountainous areas, and common in most of range. European population estimated at c. 1,000,000 pairs; abundant in Azores (20,000 pairs) and common in Madeira (300-500 pairs). Expansion of range recorded in Scandinavia and parts of C Europe during 20th century. Adversely affected by harsh winters in W & C Europe; suffers population losses in prolonged spells of severe cold weather. Has probably benefited from human activities on lowland rivers, exploiting fast-flowing water near weirs and on mill streams, and utilizing walls and bridges as nest-sites. Appears to be little affected by stream pollution.

Bibliography. Adamian & Klem (1999), Ali (1996), Ali & Ripley (1998), Alström & Mild (2003), Archer & Godman (1937-1961), Artukhin (2000), Bannerman (1963), Beasley (1995), Beehler *et al.* (1986), Benson (1946a), Benson & Benson (1977), Borrow & Demey (2001), Brazil (1991), Breitenmoser-Würster & Marti (1987), Bureš (1992, 1995), Bureš & Kral (1987), Buxton (1961), Carey *et al.* (2001), Christidis & Boles (1994), Clancey (1948), Coates (1990, 2001), Coates & Bishop (1997), Cramp (1988), Deignan (1945), Dementiev *et al.* (1970), Dickinson *et al.* (1991), Elstrodt & Zucchi (1991), Étchécopar & Hüe (1964, 1983b), Fellenberg (1985), Flousek (1986, 1987), Gibbons *et al.* (1993), Ginn *et al.* (1989), Goodman *et al.* (1989), Gopfert (1986), Handrinos & Akriotis (1997), Haneda & Ichikawa (1967), Heath & Evans (2000), Heath *et al.* (2000), Heim de Balsac & Mayaud (1962), Heinroth & Steinbacher (1952), Hirano (1985), Hirschfeld (1995), Hou Lanxin & Jiang Wei (2003), Hüe & Étchécopar (1970), Jeyarajasingam & Pearson (1999), Jørgensen (1970, 1971, 1976, 1977), Keith *et al.* (1992), Kennedy *et al.* (2000), Kolbe (1963), Koller (1980), Kral (1987), Lekagul & Round (1991), Long (1954), López (2003), Ma Ming *et al.* (2000), Mackworth-Praed & Grant (1960), Maclean (1993a), van Marle & Voous (1988), Marti & Breitenmoser-Würsten (1990, 1991), Martín & Lorenzo (2001), McClure (1998), Nauman (1905), Nicholl (1980), Norman (1970), Ormerod & Tyler (1987a, 1987b, 1991, 1992), Parslow (1967), Paz (1987), Pearson & Lack (1992), Pfeifer *et al.* (2001), Poot *et al.* (1986), Porter (1983), Rabor (1977), Rand & Gilliard (1967), Riley (1997), Roberts (1992), Rogacheva (1992), Ryves (1946), Schifferli (1972), Shirihai (1996), Sinclair & Hockey (1996), Smythies (1986, 1999), Snow & Perrins (1998), Sonobe (1982), Tellería *et al.* (1999), Thévenot *et al.* (2003), Tyler, S.J. (1972, 1979, 2002b), Tyler, S.J. & Ormerod (1991), Vaurie (1957b), Weber & Hegelbach (1993), White & Bruce (1986), Yang Guisheng & Xing Lianlian (2000), Zheng Guangmei & Zhang Cizu (2002), Zink (1973-1985).

65. Mountain Wagtail

Motacilla clara

French: Bergeronnette à longue queue **German**: Langschwanzstelze **Spanish**: Lavandera Clara
Other common names: Grey-backed/Long-tailed Wagtail

Taxonomy. *Motacilla clara* Sharpe, 1908, Simien Mountains, north Ethiopia.

Initially named as *M. longicauda*, but that name invalid, as preoccupied. May form a superspecies with *M. cinerea*. Race *chapini* possibly inseparable from *torrentium*. Three subspecies recognized.

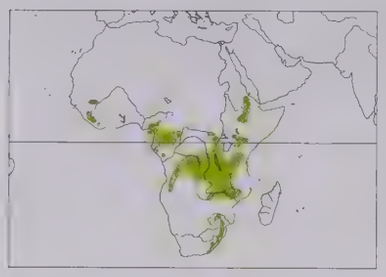
Subspecies and Distribution.

M. c. chapini Amadon, 1954 - SW Mali, S Sierra Leone, Liberia and W Ivory Coast, and from SE Nigeria and Cameroon S to Gabon and E to Central African Republic and N & S PRCongo; also Bioko I (Fernando Póo).

M. c. clara Sharpe, 1908 - highlands of Ethiopia.

M. c. torrentium Ticehurst, 1940 - E Uganda, C & S Kenya, and from E & S DRCongo, Rwanda and NW & N Tanzania S to C & SW Angola (S to Namibe), Zambia, N Zimbabwe and W Mozambique, also in mountains of E South Africa and Swaziland.

Descriptive notes. 17-19 cm; male 15-21·5 g, female 15-24·5 g. Graceful, long-tailed wagtail with much white in tail. Has narrow white supercilium ending just behind eye, blackish lores and area below eye, dark grey ear-coverts; otherwise mostly grey above, wings blackish, most remiges and wing-coverts narrowly edged white, tertials broadly edged white; central three pairs of rectrices black, T2 tipped and sometimes edged white, T3 with white inner web edged black, outer three pairs entirely white; white below, greyer on flanks, narrow black breastband (broader in centre); axillaries and underwing-coverts white, outer primary coverts black; iris dark brown; bill black, base of lower mandible sometimes greyish; legs pinkish-brown or greyish-brown. Sexes alike.



Immature differs from adult in absence or near absence of breastband, sometimes has buffy suffusion on underparts. Races differ little: *torrentium* has broader white borders of tertials, shorter wings and proportionately longer tail than nominate; *chapini* has marginally darker upperparts than previous. VOICE. Song a quiet, sustained series of trilled musical phrases and short notes, "ti-tuu-ui-tui-tui" or "tsrrrrup, tsrrrrup, tsrrrrup...", usually regularly repeated phrases, and quite varied. Call a loud, metallic, disyllabic "chirrup" or "chizzik" or high, drawn-out "sreeeeeeh" or "treeedrurrup", given on taking flight or as contact; alarm "phweep" or "chweep".

Habitat. Fast-flowing, rocky forested streams and rivers in lowlands and mountains, to at least 2000 m; altitude not important, so long as there is a steep gradient to provide waterfalls, cliffs, exposed rocks and rushing water. May occur in more open situations, especially in areas where *M. aguimp* is absent.

Food and Feeding. Mainly insects such as flies (Diptera), especially midges (Chironomidae) and empids (Empidae), blackflies (Simuliidae), also nymphal and adult mayflies (Ephemeroptera), dragonflies (Odonata), caddis flies (Trichoptera), stoneflies (Plecoptera), beetles (Coleoptera), and butterflies and moths (Lepidoptera); also other small invertebrates; small fish and tadpoles also eaten. Of 304 items found in faecal samples in one Ethiopian study, chironomid and empid flies formed 53%. Dragonfly nymphs were prominent in diet in a South African study. Forages by picking and darting for prey on the ground or vegetation; by wading in shallow water and picking prey from in, on or over the water; by jumping up to catch insects; and by flycatching over river.

Breeding. Breeds in Jan-Apr and Sept-Nov in Ethiopia, in all months in Tanzania, in Mar and Jul-Nov in Malawi, and in May and Aug-Dec in S Africa. Monogamous; highly territorial, defends 200 m to 1 km of river from conspecifics, although non-breeding *M. cinerea* may be tolerated. Territorial and courtship displays involve tail-fanning, drooping and vibrating of the wings, and aerial chases; during courtship display, individual may walk towards its mate while holding wings drooped, body plumage fluffed, tail raised and fanned. Nest, built by both sexes, often a bulky structure, with base formed from leaves, grass, moss and roots, neat deep cup of fine rootlets and hair, usually lined with hair, usually placed on ledge on riverside cliff, in recess in earth bank or among tree roots by river, sometimes under bridge; occasionally up to 50 m away from water, as on wooden beam, under thatched roof of a shelter, at edge of dense forest; nest-site reused in successive years, even same nest reused if repairable. Clutch 1-4 eggs, usually 2-3; incubation by both adults, period 13-14 days, both also feed chicks, nestling period 14-16 days; both parents continue to care for young for up to 30 days after fledging, longer with later broods.

Movements. Sedentary on permanent streams in Ethiopia; believed to be nomadic in E & S Africa, and possibly to make seasonal or migratory movements in W Africa. A single record in Botswana may have involved a migrant or wanderer from Zimbabwe or South Africa. No evidence of communal roosts or flocking.

Status and Conservation. Not globally threatened. Frequent on suitable watercourses through much of range. Possibly occurs also in S Sudan (Imatongs) and Eritrea. No evidence of any change in status, although deforestation and siltation may have adverse effect. In Ethiopia, survives on degraded streams in open areas, even where stream reduced to a trickle with algae-rich pools, and occurs on grossly polluted streams in Addis Ababa. In urban areas of South Africa, increased runoff of storm water is causing severe erosion and degradation of streams, by both scouring detritus from pools and increasing the amount of silt deposition.

Bibliography. Bannerman (1953), Benson (1946a), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Christy & Clarke (1994), Clancey (1964b), Colston & Curry-Lindahl (1986), Dean (2000), Dowsett & Dowsett-Lemaire (1991, 1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Gatter (1997), Gibbon (1989b), Ginn *et al.* (1989), Grimes (1987), Hanmer (1997), Harrison *et al.* (1997), Hickling (1983), Holland (1997), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lovett & Brina (2001), Mackworth-Praed & Grant (1960, 1962, 1973), Maclean (1993a), Maclean & Maclean (1993), Moreau (1949), Nikolaus (1987), Oschadleus (1996), Pedersen (2000), Pérez del Val (1996), Pfeifer *et al.* (2001), Piper (1980, 1989, 1994, 2001), Piper & Oatley (1998), Piper & Schulzt (1988, 1989), Rowley & Russell (1991), Serle *et al.* (1977), Short *et al.* (1990), Sinclair & Davidson (1995), Sinclair & Hockey (1996), Sinclair *et al.* (1993), Snyman (1991), Stevenson & Fanshawe (2002), Steyn (1996), Tarboton (2001), Tye (1992), Tyler & Ormerod (1986, 1987), Voelker (2002).

REFERENCES

REFERENCES OF SCIENTIFIC DESCRIPTIONS

Aldrich (1937). *Sci. Publ. Cleveland Mus. Nat. Hist.* **7**: 106 [*Elaenia flavogaster pallididorsalis*].
Alexander (1898). *Ibis* **Ser. 7, no. 4**: 107 [*Alauda razae*].
Alexander (1908). *Bull. Brit. Orn. Club* **21**: 89 [*Mirafra cantillans chadensis*].
Allen, J.A. (1888). *Auk* **5**: 287 [*Tityra semifasciata nigriceps*].
Allen, J.A. (1889). *Bull. Amer. Mus. Nat. Hist.* **2**: 86 [*Lathrotriccus euleri bolivianus*], 87 [*Chiroxiphia boliviana*], 141 [*Platyrinchus mystaceus bifasciatus*], 143 [*Platyrinchus mystaceus insularis, Poecilotriccus latirostris ochropterus*], 150 [*Lathrotriccus euleri lawrencei*].
Allen, J.A. (1900). *Bull. Amer. Mus. Nat. Hist.* **13**: 144 [*Pyrrhomyias cinnamomeus assimilis*], 151 [*Ochthoeca diadema jesupi*], 153 [*Attila spadiceus parvirostris*].
Álvarez & Whitney (2001). *Wilson Bull.* **113**: 1-9 [*Zimmerius villarejoi*].
Amadon (1954). *Amer. Mus. Novit.* **1656**: 2 [*Riparia cincta parvula*], 4 [*Motacilla clara chapini*].
Audouin (1828). In: Savigny, *Descr. Égypte* **23**: 360 [*Anthus spinoletta coutellii*].
Audubon (1828). *Birds Amer.* **1**: pl. 45 [*Empidonax traillii*].
Audubon (1838). *Orn. Biogr.* **4**: 593 [*Stelgidopteryx serripennis*].
Audubon (1844). *Birds Amer.* **7**: 334 [*Anthus spragueii*].
Aveledo & Pérez (1994). *Bol. Soc. Venez. Cienc. Nat.* **44(148)**: 243 [*Rhynchocyclus olivaceus jelambianus*].
Aveledo & Pons (1952). *Nov. Cient. Contrib. Ocas. Mus. Hist. Nat. La Salle, Ser. Zool.* **7**: 15 [*Myiobius villosus schaeferi*].
Aveledo & Pons (1953). *Mem. Soc. Cienc. Nat. La Salle* **13(35)**: 203 [*Phyllomyias burmeisteri wetmorei*].
Baird, S.F. (1858). In: Baird, Cassin & Lawrence, *Rep. Expl. Surv. R.R. Pac.* **9**: 170, 175 [*Tyrannus couchii*], 198 [*Empidonax difficilis*], 200 [*Empidonax wrightii*], xxx, 180 [*Myiarchus tyrannulus cooperi*], xxxiv, 312 [*Stelgidopteryx*].
Baird, S.F. (1859). *Proc. Acad. Nat. Sci. Philadelphia* **11**: 303 [*Myiarchus cinerascens pertinax*].
Baird, S.F. (1865). *Rev. Amer. Birds* **17**: 270, 306 [*Notiochelidon*]; **18**: 275 [*Progne elegans*], 277 [*Progne cryptoleuca*].
Baird, W.M. & Baird, S.F. (1843). *Proc. Acad. Nat. Sci. Philadelphia* **1**: 283 [*Empidonax flaviventris*], 284 [*Empidonax minimus*].
Bangs (1898). *Proc. Biol. Soc. Washington* **12**: 158 [*Elaenia frantzii browni*].
Bangs (1899). *Proc. Biol. Soc. Washington* **13**: 95 [*Myiotheretes pernix*], 96 [*Euscarthmus meloryphus paulus*], 98 [*Pipreola aureopectus decora*].
Bangs (1899). *Proc. New Engl. Zoöl. Cl.* **1**: 35 [*Manacus manacus abditivus*], 36 [*Manacus manacus purus*].
Bangs (1900). *Proc. New Engl. Zoöl. Cl.* **2**: 20 [*Mionectes oleagineus parcus*].
Bangs (1901). *Auk* **18**: 363 [*Pipra mentalis ignifera*].
Bangs (1901). *Proc. New Engl. Zoöl. Cl.* **2**: 58 [*Stelgidopteryx ruficollis aequalis*].
Bangs (1902). *Proc. New Engl. Zoöl. Cl.* **3**: 35 [*Myiopagis viridicata accola*], 37 [*Sayornis nigricans amnicola*], 85 [*Myiopagis viridicata pallens, Mionectes olivaceus galbinus*], 86 [*Onychorynchus coronatus fraterculus*].
Bangs (1903). *Proc. New Engl. Zoöl. Cl.* **3**: 103 [*Schiffornis turdina dunicola*].
Bangs (1904). *Proc. Biol. Soc. Washington* **17**: 114 [*Todirostrum cinereum finitimum*].
Bangs (1908). *Proc. Biol. Soc. Washington* **21**: 163 [*Tolmomyias sulphurescens exortivus*].
Bangs (1908). *Proc. New Engl. Zoöl. Cl.* **4**: 26 [*Pachyramphus versicolor costaricensis*], 27 [*Myiobius sulphureipygius aureatus*].
Bangs (1910). *Proc. Biol. Soc. Washington* **23**: 73 [*Mionectes olivaceus hederaceus, Tolmomyias sulphurescens asemus*].
Bangs (1911). *Proc. Biol. Soc. Washington* **24**: 189 [*Pyrocephalus rubinus blatteus*].
Bangs (1915). *Proc. Biol. Soc. Washington* **28**: 125 [*Tityra semifasciata deses*].
Bangs (1930). *Bull. Mus. Comp. Zool.* **70**: 368 [*Ammomanes burra*].
Bangs & Barbour (1922). *Bull. Mus. Comp. Zool.* **65**: 216 [*Rhynchocyclus olivaceus bardus*], 220 [*Oxyrhyncus cristatus brooksi*].
Bangs & Penard, T.E. (1918). *Bull. Mus. Comp. Zool.* **62**: 71 [*Rhytipterna simplex frederici*], 74 [*Platyrinchus coronatus gumia*], 78 [*Pitangus lictor panamensis*].
Bangs & Penard, T.E. (1921). *Bull. Mus. Comp. Zool.* **64**: 373 [*Lophotriccus vitiosus*], 395 [*Pachyramphus marginatus nanus*].
Bangs & Peters, J.L. (1928). *Bull. Mus. Comp. Zool.* **68**: 396 [*Tyrannus crassirostris pompalis*].
Banjkowski (1913). *Izvestia Kavkazskii Muz.* **7**: 231 [*Calandrella brachydactyla artemisiana*].
Bannerman (1923). *Bull. Brit. Orn. Club* **43**: 75 [*Cecropis abyssinica maxima*], 85 [*Cecropis senegalensis saturatior*], 142 [*Cecropis daurica kumboensis*], 163 [*Mirafra africana batesi*], 164 [*Mirafra africana stresemanni*]; **44**: 5 [*Ptyonoprogne fuligula bansoensis*].
Bannerman (1937). *Bull. Brit. Orn. Club* **58**: 31 [*Riparia paludicola newtoni*].
Bannerman & Bates (1926). *Ibis*: 802 [*Anthus cinnamomeus lynesi*].
Barbour & Brooks, A.C. (1917). *Proc. New Engl. Zoöl. Cl.* **6**: 52 [*Petrochelidon fulva cavicola*].
Bates (1930). *Bull. Brit. Orn. Club* **51**: 47 [*Mirafra africana henrici*], 48 [*Anthus similis bannermani*].
Bates (1932). *Bull. Brit. Orn. Club* **53**: 8 [*Mirafra rufa nigriticola*].
Bechstein (1805). *Gemein. Nat. Deutschl.* **2**: 247, 302, 465 [*Anthus*].
Behle (1938). *Condor* **40**: 89 [*Eremophila alpestris utahensis*].
Behle (1968). *Condor* **70**: 166 [*Progne subis arboricola*].
Benson (1939). *Bull. Brit. Orn. Club* **59**: 85 [*Mirafra africana nyikae*].
Benson (1942). *Bull. Brit. Orn. Club* **63**: 10 [*Hirundo megaensis*], 12 [*Anthus caffer australoabyssinicus*].
Benson (1946). *Bull. Brit. Orn. Club* **67**: 25 [*Pseudalaemon fremantlii megaensis*], 26 [*Calandrella somalica megaensis*].
Benson (1947). *Bull. Brit. Orn. Club* **68**: 9 [*Spizocorys personata yavelloensis, Galerida theklae huriensis*].
Benson (1955). *Bull. Brit. Orn. Club* **75**: 102 [*Anthus caffer mzimbaensis, Macronyx grimwoodi*].
Benson (1964). *Bull. Brit. Orn. Club* **84**: 106 [*Spizocorys conirostris harti*].
Benson (1966). *Bull. Brit. Orn. Club* **86**: 77 [*Chersomanes beesleyi*].
Benson & Irwin (1965). *Arnoldia, Rhodesia* **1(3)**: 3 [*Eremopterix verticalis harti*]; **1(37)**: 1 [*Mirafra fasciolata reynoldsi*].
Berlepsch (1879). *Orn. Centralbl.* **4**: 63 [*Pachyramphus castaneus intermedius*].
Berlepsch (1883). *Ibis*: 139 [*Myiarchus swainsoni pelzelni*], 492 [*Lepidothrix coronata velutina, Myiotheretes fumigatus lugubris*].
Berlepsch (1884). *Proc. Zool. Soc. London* **1883**: 553 [*Lophotriccus*].
Berlepsch (1884). *J. Orn.* **32**: 298 [*Poecilotriccus*].
Berlepsch (1884). *Ibis*: 433 [*Knipolegus orenocensis*].
Berlepsch (1888). *Auk* **5**: 457 [*Myiobius atricaudus ridgwayi*].
Berlepsch (1889). *J. Orn.* **37**: 301 [*Camptostoma obsoletum olivaceum*].
Berlepsch (1893). *Orn. Monatsber.* **1**: 12 [*Suiriri suiriri bahiae, Serpophaga munda*].
Berlepsch (1897). *Orn. Monatsber.* **5**: 174 [*Carpodectes hopkei*].
Berlepsch (1901). *J. Orn.* **49**: 87 [*Hemitriccus spodiops, Hemitriccus flammulatus*], 88 [*Pseudotriccus simplex*], 89 [*Pogonotriccus ophthalmicus ottonis*], 90 [*Phyllomyias sclateri*].
Berlepsch (1902). *Nov. Zool.* **9**: 41 [*Phaeomyias*].
Berlepsch (1906). *Bull. Brit. Orn. Club* **16**: 98 [*Ochthoeca leucophrys tucumana, Myiotheretes striaticollis pallidus*].
Berlepsch (1907). *Ornis* **14**: 352 [*Agriornis lividus fortis*], 355 [*Poecilotriccus sylvia schulzi*], 357 [*Pogonotriccus venezuelanus*], 358 [*Mecocerculus hellmayri*], 359 [*Zimmerius improbus petersi*], 360 [*Capsiempis flaveola leucophrys*], 394 [*Elaenia martinica caymanensis*], 396 [*Elaenia martinica remota*], 397 [*Elaenia pelzelni*], 407 [*Elaenia chiriquensis brachyptera*], 421 [*Myiopagis gaimardii bogotensis, Myiopagis gaimardii guianensis*], 471 [*Knipolegus aterrimus heterogyna*].
Berlepsch (1908). *Nov. Zool.* **15**: 129 [*Cnemotriccus fuscatus fumosus*].
Berlepsch (1912). *Orn. Monatsber.* **20**: 19 [*Knipolegus orenocensis xinguensis*], 20 [*Platyrinchus platyrhynchos amazonicus*].
Berlepsch & Hartert (1902). *Nov. Zool.* **9**: 34 [*Pyrocephalus rubinus saturatus*], 38 [*Taeniotriccus, Taeniotriccus andrei*], 40 [*Polystictus pectoralis brevipennis*].
Berlepsch & Leverkühn (1890). *Ornis* **6**: 17 [*Myiarchus tyrannulus bahiae*].
Berlepsch & Stolzmann (1894). *Ibis* **6(6)**: 389 [*Myiornis albiventris*], 391 [*Mitrephanes olivaceus*], 392 [*Dixiphia pipra comata*].
Berlepsch & Stolzmann (1896). *Proc. Zool. Soc. London* **1896**: 355 [*Ochthoeca fumicolor brunneifrons*], 356 [*Ochthoeca frontalis spodionota*], 357 [*Sayornis nigricans angustirostris*], 359 [*Muscisaxicola maculirostris rufescens*], 361 [*Tachuris rubrigastra alticola*], 366 [*Knipolegus poecilurus peruanus*], 369 [*Tityra semifasciata fortis*].
Berlepsch & Stolzmann (1906). *Ornis* **13**: 85 [*Lophotriccus pileatus hypochlorus*], 88 [*Myiophobus fasciatus saturatus*].
Berlepsch & Taczanowski (1883). *Proc. Zool. Soc. London* **1883**: 68 [*Camptostoma obsoletum sclateri*].
Berlepsch & Taczanowski (1884). *Proc. Zool. Soc. London* **1883**: 296 [*Anairetes parulus aequitorialis*], 556 [*Tolmomyias sulphurescens aequatorialis*].
Berlioz (1962). *Bull. Mus. Hist. Nat. Paris* **34**: 138 [*Contopus albogularis*].
Bertoni, W. (1901). *Aves Nuevas Paraguay*: 129 [*Myiornis*].
Bianchi (1904). *Ann. Mus. Acad. Imp. Sci. St. Pétersb.* **9**: xxiv, xxx, xxxi [*Alauda gulgula inopinata*].
Bianchi (1904). *Bull. Acad. Imp. Sci. St. Pétersb.* **21**: 232, 241 [*Ammomanopsis*].
Bianchi (1904). *Ibis* **Ser. 8, no. 4**: 371 [*Eremophila alpestris przewalskii*], 372 [*Eremophila alpestris khumensis*].
Bianchi (1907). *Bull. Acad. Imp. Sci. St. Pétersb.* **25**: 65 [*Galerida cristata cypriaca*], 81 [*Mirafra javanica halli*].
Billberg (1828). *Syn. Faun. Scand.* **1(2)**: 50 [*Motacilla flava thunbergi*].
Binford (1965). *Occas. Pap. Louisiana State Univ. Mus. Zool.* **30**: 5 [*Rhynchocyclus brevirostris pallidus*].
Bishop (1896). *Auk* **13**: 130 [*Eremophila alpestris hoyti*].
Bishop (1900). *Auk* **17**: 116 [*Contopus sordidulus saturatus*].
Blake (1959). *Nat. Hist. Misc. Chicago* **171**: 1 [*Poecilotriccus albifacies*].
Blake (1961). *Fieldiana Chicago* **44**: 63 [*Myiozetetes luteiventris septentrionalis*].
Blanford (1869). *Ann. and Mag. Nat. Hist.* **Ser. 4, no. 4**: 329 [*Hirundo aethiopica*], 330 [*Galerida theklae praetermissa*].
Blanford (1872). *J. Asiatic Soc. Bengal* **41(2)**: 62 [*Eremophila alpestris elwesi*].
Blanford (1876). *Zool. Geol.* **2**: 232 [*Motacilla alba persica*].
Blundell & Lovat (1899). *Bull. Brit. Orn. Club* **10**: xx [*Psalidoprocne pristoptera blanfordi*].
Blyth (1834). *Mag. Nat. Hist. J. Zool.* **7**: 342 [*Motacilla flava flavissima*].
Blyth (1845). *Ann. and Mag. Nat. Hist.* **13**: 116 [*Dendronanthus*].
Blyth (1845). *J. Asiatic Soc. Bengal* **13**: 958 [*Mirafra erythroptera*], 959 [*Mirafra affinis*], 960 [*Mirafra cantillans*], 962 [*Calandrella raytal*].
Blyth (1847). *J. Asiatic Soc. Bengal* **16**: 437 [*Anthus roseatus*].
Blyth (1849). *J. Asiatic Soc. Bengal* **18**: 814 [*Cecropis daurica hyperythra*].
Blyth (1853). *J. Asiatic Soc. Bengal* **22**: 583 [*Ammomanes deserti phoenicuroides*].
Blyth (1855). *J. Asiatic Soc. Bengal* **24**: 258 [*Calendulauda*], 471 [*Petrochelidon fluvicola*].
Blyth (1867). *Ibis*: 46 [*Melanocorypha maxima*], 185 [*Eremopterix nigriceps affinis*].
Bocage (1868). *J. Sci. Math. Phys. Nat., Acad. Real Sci. Lisboa* **2(5)**: 47 [*Hirundo angolensis*].
Bocage (1877). *J. Sci. Math. Phys. Nat., Acad. Real Sci. Lisboa* **6(22)**: 158 [*Hirundo nigrorufa*].
Bocage (1878). *J. Sci. Math. Phys. Nat., Acad. Real Sci. Lisboa* **6(24)**: 256 [*Petrochelidon rufigula*].
Bocage (1880). *J. Sci. Math. Phys. Nat., Acad. Real Sci. Lisboa* **8**: 60, 68 [*Mirafra angolensis*].
Boddaert (1783). *Table Planches Enlum*: 24 [*Lophotriccus galeatus*], 27 [*Pachyramphus rufus*], 32 [*Tachycineta albiventer*], 42 [*Pyrocephalus rubinus, Fluvicola pica*], 45 [*Riparia cincta, Hirundo rustica erythrogaster, Cecropis cucullata*].
Bogdanov (1879). *Trudy. Obsh. Est. Imp. Kazan. Univ.* **8(4)**: 75 [*Alauda arvensis armenica*].
Boie (1826). *Isis von Oken* **19**: col. 971 [*Progne, Cecropis*], col. 973 [*Knipolegus, Xolmis*].
Boie (1828). *Isis von Oken* **21**: col. 317 [*Knipolegus lophotes*], col. 318 [*Lipaugus*], col. 321 [*Galerida*], col. 322 [*Melanocorypha, Eremophila*].
Boie (1844). *Isis von Oken* **37**: col. 172 [*Atticora*].
Boissonneau (1840). *Rev. Zool.* **3**: 2 [*Cotinga nattereri*], 3 [*Pipreola riefferii*], 71 [*Myiotheretes fumigatus*].
Bolle (1862). *J. Orn.* **10**: 357 [*Anthus berthelotii*].
Bonaparte (1825). *Amer. Orn.* **1**: 20 [*Sayornis saya*].
Bonaparte (1838). *Proc. Zool. Soc. London* **1837**: 113 [*Chiroxiphia linearis*], 122 [*Machaeropterus striolatus*].
Bonaparte (1845). *Atti Sesta Riun. Sci. Ital.* **1844**: 405 [*Mecocerculus leucophrys setophagoides*].
Bonaparte (1850). *Compt. Rend. Acad. Sci. Paris* **31**: 423 [*Ramphocoris*].
Bonaparte (1850). *Consp. Av.* **1**: 175 [*Masius*], 190 [*Contopus cinereus bogotensis*], 215 [*Menura alberti*], 242 [*Ramphocoris clotbey*], 245 [*Galerida cristata isabellina, Alauda arvensis cantarella*], 246 [*Eremophila alpestris albigula*], 247 [*Anthus richardi sinensis*], 249 [*Anthus correndera grayi*], 343 [*Delichon dasypus*], 512 [*Eremopterix leucotis smithi*].
Bonaparte (1854). *Ateneo Italiano* **2(11)**: 314 [*Schiffornis, Haematoderus*], 315 [*Porphyrolaema*], 316 [*Lepidothrix, Corapipo, Machaeropterus*].
Bonaparte (1854). *Compt. Rend. Acad. Sci. Paris*: 657 [*Sayornis, Attila spadiceus citreopygus*], 658 [*Pachyramphus aglaiae latirostris*].
Bonaparte (1857). *Bull. Soc. Linn. Normandie* **2**: 35 [*Myiodynastes*].

Bonaparte (1857). *Riv. Contemp. Turin* **9**: 210 [*Phedina*].
Bond (1936). *Proc. Acad. Nat. Sci. Philadelphia* **88**: 361 [*Myiarchus tyrannulus insularum*].
Bond (1943). *Not. Nat. Philadelphia* **127**: 1 [*Myiophobus pulcher oblitus*].
Bond (1947). *Not. Nat. Philadelphia* **196**: 1 [*Tolmomyias flaviventris zimmeri*], 2 [*Pseudotriccus pelzelni peruvianus*].
Bond & Meyer de Schauensee (1940). *Not. Nat. Philadelphia* **44**: 4 [*Lepidothrix coronata regulis*].
Bradfield (1944). *New South Afr. Orn. Rec. & New Forms*: 3 [*Certhilauda benguelensis kuokoensis*].
Brehm, A.E. (1854). *J. Orn.* **2**: 74 [*Motacilla flava pygmaea*].
Brehm, A.E. (1857). *Allg. Deutsche Naturh. Zeitung, Neue Folge* **3**: 455 [*Calandrella rufescens apetzii*], 456 [*Galerida theklae*].
Brehm, C.L. (1823). *Lehrb. Naturg. Eur. Vög.* **1**: 259 [*Anthus petrosus littoralis*].
Brehm, C.L. (1841). *Isis von Oken*: col. 124, 128 [*Galerida cristata meridionalis*].
Brehm, C.L. (1842). *Isis von Oken*: col. 504 [*Eremophila alpestris bicornis*].
Brehm, C.L. (1850). *Naumannia*: 208 [*Galerida cristata tenuirostris*].
Brehm, C.L. (1855). *Vogelfang*: 123 [*Galerida cristata nigricans*], 124 [*Galerida cristata altirostris*].
Brehm, C.L. (1857). *J. Orn.* **5**: 32 [*Motacilla cinerea robusta*].
Brehm, C.L. (1858). *Naumannia*: 207 [*Galerida cristata pallida*], 208 [*Galerida cristata maculata*].
Brewster (1888). *Auk* **5**: 90 [*Empidonax difficilis cineritius*], 137 [*Mitrephanes phaeocercus tenuirostris*].
Brewster (1889). *Auk* **6**: 92 [*Progne subis hesperia*].
Brewster (1889). *Descr. Supposed New Birds from West. N. Amer. & Mexico*: 86 [*Empidonax affinis pulverius*].
Brewster (1891). *Auk* **8**: 144 [*Contopus sordidulus peninsulae*].
Brewster (1895). *Auk* **12**: 161 [*Empidonax alnorum*].
Brewster (1902). *Bull. Mus. Comp. Zool.* **41**: 167 [*Tachycineta thalassina brachyptera*].
Brisson (1760). *Orn.* **1**: 32 [*Cotinga*], 44 [*Rupicola, Manacus*].
Brodkorb (1935). *Occas. Pap. Mus. Zool. Univ. Michigan* **306**: 1 [*Empidonax occidentalis hellmayri*].
Brodkorb (1942). *Condor* **44**: 217 [*Stelgidopteryx serripennis stuarti*].
Brodkorb (1943). *Occas. Pap. Mus. Zool. Univ. Michigan* **478**: 3 [*Myiopagis viridicata pacifica*].
Brooks, W.E. (1880). *Stray Feathers* **8**: 488 [*Calandrella acutirostris tibetana*].
Bryant, H. (1859). *Proc. Boston Soc. Nat. Hist.* **7**: 109 [*Contopus caribaeus bahamensis*], 111 [*Tachycineta cyaneoviridis*].
Bryant, H. (1864). *Proc. Boston Soc. Nat. Hist.* **9**: 279 [*Tyrannus caudifasciatus bahamensis*].
Bryant, H. (1866). *Proc. Boston Soc. Nat. Hist.* **10**: 249 [*Myiarchus antillarum*].
Bryant, H. (1867). *Proc. Boston Soc. Nat. Hist.* **11**: 66 [*Myiarchus sagrae lucaysiensis*], 90 [*Myiarchus stolidus dominicensis*], 91 [*Contopus hispaniolensis*].
Burleigh & Duvall (1948). *Proc. Biol. Soc. Washington* **61**: 167 [*Contopus caribaeus morenoi*].
Burmeister (1856). *Syst. Übers. Thiere Bras.* **2**: 465 [*Tyrannus albogularis*], 477 [*Suiriri suiriri affinis*].
Burmeister (1860). *J. Orn.* **8**: 247 [*Xolmis rubetra*], 248 [*Muscisaxicola capistratus, Muscisaxicola frontalis*].
Burmeister (1861). *Reise La Plata Staaten* **2**: 455 [*Stigmatura budytoides flavocinerea*].
Burmeister (1869). *Proc. Zool. Soc. London* **1868**: 635 [*Xenopsaris albinucha*].
Buturlin (1907). *Orn. Monatsber.* **15**: 197 [*Motacilla citreola werae*].
Cabanis (1844). *Archiv Naturgeschichte* **10(1)**: 272 [*Myiarchus*], 275 [*Leptopogon, Mionectes*].
Cabanis (1846). In: Tschudi, *Unters. Faun. Peru., Aves*: 148 [*Mionectes rufiventris*].
Cabanis (1847). *Archiv Naturgeschichte* **13(1)**: 234 [*Piprites, Piprites chloris chlorion*], 235 [*Chiroxiphia, Xenopipo, Xenopipo atronitens*], 246 [*Pachyramphus major*], 249 [*Rhynchocyclus brevirostris, Terenotriccus erythrurus*], 253 [*Atalotriccus pilaris*], 255 [*Ochthoeca*], 351 [*Myiarchus validus*].
Cabanis (1848). In: Schomburgk, *Reisen Brit. Guiana* **3**: 702 [*Colonia colonus poecilonota*].
Cabanis (1850). *Mus. Hein., Th. 1*: 47 [*Petrochelidon*], 48 [*Psalidoprocne, Tachycineta, Tachycineta meyeni*], 49 [*Cheramoeca, Riparia paludicola minor*], 50 [*Ptyonoprogne fuligula obsoleta*].
Cabanis (1851). *Mus. Hein., Th. 1*: 123 [*Calandrella rufescens minor*], 124 [*Eremopterix nigriceps melanauchen*], 125 [*Ammomanes*], 126 [*Chersomanes*].
Cabanis (1855). *J. Orn.* **3**: 479 [*Contopus*], 480 [*Empidonax*].
Cabanis (1861). *J. Orn.* **9**: 247 [*Myiodynastes hemichrysus*], 250 [*Myiarchus tuberculifer nigricapillus*].
Cabanis (1865). *J. Orn.* **13**: 414 [*Leptopogon amaurocephalus pileatus*].
Cabanis (1868). *J. Orn.* **16**: 195 [*Lathrotriccus euleri*], 196 [*Lathrotriccus euleri argentinus*].
Cabanis (1873). *J. Orn.* **21**: 67 [*Zimmerius cinereicapilla, Hemitriccus rufigularis*], 68 [*Pogonotriccus orbitalis, Pachyramphus validus audax*], 158 [*Myiotriccus ornatus stellatus*], 320 [*Myiophobus ochraceiventris*].
Cabanis (1874). *J. Orn.* **22**: 98 [*Mecocerculus stictopterus taeniopterus, Hemitriccus granadensis pyrrhops*], 99 [*Pipriles chloris tschudii*].
Cabanis (1875). *J. Orn.* **23**: 224 [*Contopus latirostris blancoi*], 237 [*Calendulauda sabota plebeja*].
Cabanis (1878). *J. Orn.* **26**: 205 [*Tmetothylacus tenellus*].
Cabanis (1879). *Orn. Centralb.*: 138 [*Tmetothylacus*].
Cabanis (1883). *J. Orn.* **31**: 214 [*Contopus fumigatus brachyrhynchus, Myiarchus swainsoni ferocior*], 215 [*Elaenia strepera, Myiarchus tuberculifer atriceps*].
Cabanis (1884). *J. Orn.* **32**: 254 [*Anthus antarcticus*].
Cabanis & Heine (1859). *Mus. Hein., Th. 2*: 49 [*Todirostrum chrysocrotaphum illigeri*], 50 [*Todirostrum cinereum sclateri*], 52 [*Phylloscartes, Hemitriccus*], 54 [*Phylloscartes sylviolus, Pogonotriccus*], 56 [*Capsiempis, Rhynchocyclus*], 57 [*Phyllomyias, Phyllomyias burmeisteri*], 58 [*Camptostoma obsoletum pusillum*], 59 [*Phaeomyias murina incomta*], 62 [*Conopias, Myiozetetes similism columbianus*], 63 [*Pitangus sulphuratus maximiliani*], 66 [*Pyrrhomyias*], 68 [*Sayornis nigricans latirostris*], 70 [*Empidonax fulvifrons rubicundus*], 72 [*Contopus pertinax, Myiarchus swainsoni*], 75 [*Sirystes*], 76 [*Empidonomus*], 77 [*Tyrannus melancholicus satrapa*], 90 [*Chloropipo*], 99 [*Rupicola peruvianus saturatus*].
Carriker (1930). *Proc. Acad. Nat. Sci. Philadelphia* **82**: 372 [*Mionectes macconnelli peruanus*].
Carriker (1932). *Proc. Acad. Nat. Sci. Philadelphia* **83**: 460 [*Todirostrum chrysocrotaphum neglectum, Hemitriccus granadensis caesius*], 461 [*Myiophobus inornatus*], 462 [*Myiophobus roraimae rufipennis*].
Carriker (1933). *Proc. Acad. Nat. Sci. Philadelphia* **85**: 23 [*Ochthoeca pulchella similis*], 24 [*Mecocerculus leucophrys pallidior*], 26 [*Camptostoma obsoletum griseum*], 27 [*Camptostoma obsoletum maranonicum, Anairetes alpinus*].
Carriker (1934). *Proc. Acad. Nat. Sci. Philadelphia* **86**: 319 [*Pachyramphus versicolor meridionalis*], 320 [*Masius chrysopterus peruvianus*].
Carriker (1935). *Proc. Acad. Nat. Sci. Philadelphia* **87**: 329 [*Laniisoma elegans cadwaladeri*], 331 [*Ochthoeca frontalis boliviana*], 334 [*Tolmomyias flaviventris subsimilis*], 336 [*Anairetes alpinus bolivianus*], 338 [*Notiochelidon murina cyanodorsalis*].
Cassin (1851). *Proc. Acad. Nat. Sci. Philadelphia* **5**: 349 [*Manacus manacus flaveolus*].
Cassin (1853). *Proc. Acad. Nat. Sci. Philadelphia* **6**: 370 [*Notiochelidon murina, Neochelidon tibialis*], 371 [*Cecropis badia*].
Cassin (1857). *Proc. Acad. Nat. Sci. Philadelphia* **9**: 38 [*Psalidoprocne nitens*].
Cave (1940). *Bull. Brit. Orn. Club* **60**: 96 [*Mirafra hypermetra kathangorensis*].
Chapin (1923). *Amer. Mus. Novit.* **56**: 7 [*Psalidoprocne pristoptera mangbettorum*].
Chapin (1925). *Ibis* **12(1)**: 149 [*Petrochelidon fuliginosa*].
Chapin (1932). *Amer. Mus. Novit.* **570**: 13 [*Psalidoprocne pristoptera ruwenzori*].
Chapin (1937). *Rev. Zool. Bot. Afr.* **29**: 342 [*Anthus vaalensis marungensis*], 343 [*Anthus pallidiventris esobe*], 344 [*Anthus similis dewittei*], 345 [*Anthus nyassae schoutedeni*].
Chapin (1946). *Bull. Brit. Orn. Club* **67**: 7 [*Mirafra africana malbranti*].
Chapman (1892). *Bull. Amer. Mus. Nat. Hist.* **4**: 303 [*Tyrannus caudifasciatus jamaicensis*].
Chapman (1899). *Bull. Amer. Mus. Nat. Hist.* **12**: 154 [*Mecocerculus leucophrys nigriceps*], 155 [*Phyllomyias urichi*].
Chapman (1912). *Bull. Amer. Mus. Nat. Hist.* **31**: 152 [*Muscisaxicola alpinus columbianus*], 153 [*Zimmerius chrysops minimus*], 154 [*Phyllomyias nigrocapillus flavimentum*], 155 [*Pachyramphus homochrous canescens*].
Chapman (1914). *Bull. Amer. Mus. Nat. Hist.* **33**: 174 [*Rhynchocyclus pacificus*], 175 [*Rhynchocyclus olivaceus flavus*], 176 [*Hemitriccus margaritaceiventer septentrionalis*], 178 [*Camptostoma obsoletum caucae*], 179 [*Pitangus sulphuratus caucensis*], 624 [*Manacus manacus interior*], 625 [*Manacus manacus bangsi*], 626 [*Manacus manacus leucochlamys*], 628 [*Pachyramphus castaneus saturatus*], 629 [*Pachyramphus cinnamomeus magdalenae*], 630 [*Pipreola riefferii occidentalis*], 631 [*Pyroderus scutatus occidentalis*].
Chapman (1915). *Bull. Amer. Mus. Nat. Hist.* **34**: 645 [*Manacus vitellinus milleri*], 646 [*Polystictus pectoralis bogotensis*].
Chapman (1917). *Bull. Amer. Mus. Nat. Hist.* **36**: 480 [*Dixiphia pipra minima*].
Chapman (1919). *Proc. Biol. Soc. Washington* **32**: 262 [*Phyllomyias sclateri subtropicalis*], 263 [*Anairetes agraphia*], 264 [*Mionectes striaticollis columbianus*].
Chapman (1921). *Bull. US Natl. Mus.* **117**: 88 [*Ochthoeca rufipectoralis tectricialis*].
Chapman (1922). *Amer. Mus. Novit.* **30**: 7 [*Notiochelidon cyanoleuca peruviana*], 8 [*Notiochelidon flavipes*].
Chapman (1923). *Amer. Mus. Novit.* **67**: 9 [*Mionectes olivaceus fasciaticollis*].
Chapman (1924). *Amer. Mus. Novit.* **118**: 1 [*Mecocerculus leucophrys brunneomarginatus*], 3 [*Ochthoeca piurae*], 5 [*Platyrinchus mystaceus zamorae, Poecilotriccus ruficeps peruvianus*], 7 [*Anairetes reguloides albiventris, Poecilotriccus latirostris caniceps*], 8 [*Anairetes flavirostris huancabambae, Anairetes flavirostris cuzcoensis*], 9 [*Mionectes striaticollis viridiceps*], 10 [*Phaeomyias murina inflava*]; **138**: 1 [*Zimmerius chrysops albigularis*], 3 [*Myiobius atricaudus portovelae*], 4 [*Contopus fumigatus zarumae*], 5 [*Machaeropterus striolatus antioquiae, Chloropipo holochlora viridior*], 6 [*Piprites chloris antioquiae, Piprites chloris boliviana*], 7 [*Manacus manacus maximus*], 8 [*Ampelion rufaxilla antioquiae*], 9 [*Neochelidon tibialis minima, Neochelidon tibialis griseiventris*], 12 [*Haplochelidon andecola oroyae, Petrochelidon rufocollaris aequatorialis*].
Chapman (1925). *Amer. Mus. Novit.* **187**: 5 [*Pipreola frontalis squamipectus, Ramphotrigon fuscicauda*], 6 [*Progne murphyi*]; **191**: 10 [*Pipreola formosa rubidior*]; **205**: 1 [*Tumbezia*].
Chapman (1926). *Amer. Mus. Novit.* **231**: 2 [*Ochthoeca cinnamomeiventris angustifasciata*], 3 [*Stigmatura napensis bahiae*], 4 [*Anairetes flavirostris arequipae, Stigmatura napensis*], 6 [*Cnemotriccus fuscatus fuscatior*], 7 [*Contopus nigrescens canescens*].
Chapman (1927). *Amer. Mus. Novit.* **250**: 4 [*Mionectes striaticollis palamblae, Myiotheretes fumigatus cajamarcae*].
Chapman (1929). *Amer. Mus. Novit.* **341**: 3 [*Elaenia dayi*]; **380**: 19 [*Hemitriccus margaritaceiventer duidae*], 20 [*Elaenia dayi tyleri*], 21 [*Contopus fumigatus duidae, Chloropipo uniformis duidae*].
Chapman (1930). *Auk* **47**: 88 [*Phibalura flavirostris boliviana*].
Chapman (1939). *Amer. Mus. Novit.* **1047**: 1 [*Oxyrhyncus cristatus phelpsi*], 2 [*Oxyrhyncus cristatus tocantinsi*].
Cherrie (1891). *Proc. US Natl. Mus.* **14**: 338 [*Pachyramphus albogriseus ornatus*], 343 [*Pachyramphus cinnamomeus similis*].
Cherrie (1909). *Brooklyn Inst. Arts & Sci. Mus. Bull.* **1**: 390 [*Inezia*].
Cherrie & Reichenberger (1923). *Amer. Mus. Novit.* **58**: 4 [*Manacus manacus subpurus*].
Chisholm (1921). *Emu* **20**: 223 [*Menura novaehollandiae edwardi*].
Chubb (1910). *Ibis*: 588 [*Tolmomyias sulphurescens grisescens*].
Chubb (1914). *Bull. Brit. Orn. Club* **33**: 132 [*Hemitriccus josephinae*].
Chubb (1918). *Bull. Brit. Orn. Club* **38**: 48 [*Corythopis torquatus sarayacuensis*].
Chubb (1919). *Ann. and Mag. Nat. Hist.* **Ser. 9, no. 4**: 301 [*Myiornis ecaudatus miserabilis*], 303 [*Mionectes macconnelli, Mionectes macconnelli roraimae*].
Chubb (1920). *Bull. Brit. Orn. Club* **40**: 108 [*Tolmomyias assimilis examinatus*].
Chubb (1923). *Hornero* **3(1)**: 34, 35 [*Anthus bogotensis shiptoni*].
Clancey (1942). *Bull. Brit. Orn. Club* **63**: 6 [*Anthus pratensis whistleri*].
Clancey (1951). *Ann. Natal Mus.*: 144 [*Anthus cinnamomeus spurium*].
Clancey (1952). *Bonn. Zool. Beitr.* **1-2**: 18 [*Anthus lineiventris stygium*].
Clancey (1952). *Durban Mus. Novit.* **4(3)**: 48 [*Calandrella cinereu williamsi*], 51 [*Macronyx capensis stabilior*].
Clancey (1956). *Durban Mus. Novit.* **4(7)**: 280 [*Anthus similis petricolus*], 283 [*Mirafra africana isolata*], 287 [*Anthus similis palliditinctus*].
Clancey (1958). *Durban Mus. Novit.* **5(8)**: 101 [*Calendulauda sabota suffusca*].
Clancey (1958). *Ostrich* **29**: 77 [*Macronyx croceus tertius*].
Clancey (1964). *Birds Natal & Zululand*: 397 [*Anthus caffer traylori*].
Clancey (1964). *Durban Mus. Novit.* **7**: 178-179 [*Anthus nyassae frondicolus*].
Clancey (1966). *Durban Mus. Novit.* **7**: 528 [*Macronyx ameliae altanus*].
Clancey (1967). *Durban Mus. Novit.* **8**: 109 [*Anthus leucophrys tephridorsus*].
Clancey (1968). *Bull. Brit. Orn. Club* **88(9)**: 170-171 [*Pinarocorys nigricans occidentis*].
Clancey (1969). *Durban Mus. Novit.* **8(15)**: 235 [*Cecropis abyssinica ampliformis*].
Clancey (1971). *Durban Mus. Novit.* **9(9)**: 121 [*Calandrella cinerea alluvia*].
Clancey (1978). *Durban Mus. Novit.* **11(16)**: 284 [*Calandrella cinerea fulvida*].
Clancey (1985). *Ostrich* **56**: 165 [*Anthus cinnamomeus winterbottomi*].
Clancey (1986). *Gerfaut* **76**: 198 [*Anthus cinnamomeus stabilis*], 201 [*Anthus cinnamomeus eximius*]
Clancey (1989). *Cimbebasia* **10**: 47 [*Anthus nyassae chersophilus*].
Clancey (1990). *Cimbebasia* **11**: 125-126 [*Anthus vaalensis namibicus*].
Clancey (1990). *Durban Mus. Novit.* **15**: 54 [*Anthus similis primarius*].
Clancey (1993). *Bull. Brit. Orn. Club* **113(3)**: 176 [*Galerida magnirostris sedentaria*].
Clancey & Irwin (1966). *Durban Mus. Novit.* **8(3)**: 30 [*Riparia cincta xerica*].
Clarke, S.R. (1919). *Bull. Brit. Orn. Club* **40**: 49 [*Alaemon hamertoni tertia*].
Clarke, S.R. (1920). *Bull. Brit. Orn. Club* **40**: 64 [*Heteromirafra archeri*].
Coelho & Silva (1998). *Ararajuba* **6**: 81-84 [*Antilophia bokermanni*].
Colston (1982). *Bull. Brit. Orn. Club* **102(3)**: 107 [*Mirafra somalica rochei*], 111-112 [*Galerida theklae mallablensis*].
Colston (1987). *Bull. Brit. Orn. Club* **107(2)**: 92 [*Anthus melindae mallablensis*].
Coopmans & Krabbe (2000). *Wilson Bull.* **112**: 305-312 [*Myiopagis olallai*].
Cory (1888). *Auk* **5**: 47 [*Elaenia martinica barbadensis*], 266 [*Myiarchus oberi berlepschii*].
Cory (1895). *Auk* **12**: 279 [*Elaenia fallax cherriei*].
Cory (1913). *Field Mus. Nat. Hist. Publ., Orn. Ser.* **1**: 289 [*Inezia tenuirostris, Inezia caudata intermedia*].
Cory (1916). *Field Mus. Nat. Hist. Publ., Orn. Ser.* **1**: 342 [*Todirostrum cinereum cearae*], 345 [*Anthus bogotensis immaculatus*].
Coues (1865). *Ibis*: 537 [*Empidonax fulvifrons pygmaeus*].
Coues (1866). *Proc. Acad. Nat. Sci. Philadelphia*: 61 [*Contopus sordidulus veliei*].
Coues (1874). *Birds Northwest* **38**: 39 [*Eremophila alpestris leucolaema*].
Coues (1882). *Bull. Nuttall Orn. Club* **7**: 55 [*Mitrephanes*].
Cuervo, Salaman, Donegan & Ochoa (2001). *Ibis* **143(3)**: 353-368 [*Lipaugus weberi*].
Cuvier (1816). *Règne Animal* **4**: 172 [*Procnias averano carnobarba*].
Dalmas (1900). *Mém. Soc. Zool. France* **13**: 139 [*Chiroxiphia pareola atlantica*].
Darwin (1839). *Zool. Voy. 'Beagle'* **9**: 46 [*Myiobius*], 48 [*Colorhamphus parvirostris*].
De Vis (1894). *Ann. Rept. Brit. New Guinea*: 103 [*Anthus gutturalis*].
Dekeyser & Villiers (1950). *Bull. Inst. Franç. Afr. Noire* **12**: 675 [*Galerida cristata balsaci*].
Deppe (1830). *Preis-Verzeichn. Saugeth. Vog. Mex. Gesam.*: 2 [*Elaenia mesoleuca*].
Des Murs (1856). In: Castelnau, *Expéd. Amer. Sud, Zool.* **1**: 55 [*Casiornis*], 66 [*Schiffornis major*].
Desfontaines (1789). *Mém. Acad. Roy. Sci. Paris*: 504 [*Alaemon alaudipes*].
Desmarest (1805). *Hist. Nat. Tangaras* **livr. 4**: 2 [*Platyrinchus*].
Desmarest (1806). *Hist. Nat. Tangaras* **livr. 6**: 58 [*Manacus manacus guttur osus*]; **livr. 10**: pl. 70 [*Todirostrum maculatum*], pl. 71 [*Poecilotriccus sylvia*].
Deville (1849). *Rev. et Mag. Zool.* **Ser. 2, no. 1**: 56 [*Onychorynchus coronatus castelnaui*].
Deville & Sclater, P.L. (1852). *Rev. et Mag. Zool.* **Ser. 2, no. 4**: 226 [*Porphyrolaema porphyrolaema*].
Dickerman (1985). *Bull. Brit. Orn. Club* **105**: 74 [*Mecocerculus leucophrys chapmani*].
Dickerman & Phelps, Jr (1987). *Bol. Soc. Venez. Cienc. Nat.* **41(144)**: 29 [*Myiophobus roraimae sadiecoatsae*], 30 [*Elaenia pallatangae davidwillardi*].
Dickey & van Rossem (1929). *Proc. Biol. Soc. Washington* **42**: 217 [*Attila spadiceus salvadorensis*].
Dresser (1874). *Birds Europe* **32**: 3; **33**: 4 [*Eremophila alpestris brandti*].
Du Bus de Gisignies (1847). *Bull. Acad. Roy. Sci. Belg.* **14**: 104 [*Tityra inquisitor albitorques*].
Duckworth, Alström, Davidson, Evans, Poole, Setha & Timmins (2001). *Bull. Brit. Orn. Club* **121**: 154-182 [*Motacilla samveasnae*].
Dumont (1821). *Dict. Sci. Nat. (éd. Levrault)* **21**: 266 [*Motacilla aguimp*].
Dwight (1890). *Auk* **7**: 148 [*Eremophila alpestris adusta*], 152 [*Eremophila alpestris insularis*], 153 [*Eremophila alpestris merrillі*].
Dwight & Griscom (1924). *Amer. Mus. Novit.* **142**: 3 [*Contopus cinereus rhizophorus*].
Dwight & Griscom (1927). *Amer. Mus. Novit.* **254**: 1 [*Xenotriccus*], 2 [*Xenotriccus callizonus*].
Eisenmann & Phelps, Jr (1971). *Bol. Soc. Venez. Cienc. Nat.* **29**: 187 [*Todirostrum maculatum amacurense*].
Elliot (1897). *Field-Columbian Mus. Publ. Orn.* **Ser. 1, no. 2**: 37 [*Mirafra africana sharpii*], 39 [*Ammomanes deserti akeleyi*].
Érard (1975). *Alauda* **43(2)**: 123 [*Heteromirafra sidamoensis*].
Érard (1975). *Oiseau et RFO* **45(4)**: 310 [*Mirafra gilletti arorihensis*], 310-311 [*Mirafra degodiensis*].
Érard & Jarry (1973). *Bull. Brit. Orn. Club* **93(4)**: 139-140 [*Galerida theklae harrarensis*].
Érard & de Naurois (1973). *Bull. Brit. Orn. Club* **93(4)**: 141 [*Galerida theklae huei*].
Erlanger (1897). *Orn. Monatsber.* **5**: 186 [*Galerida theklae carolinae*].

Erlanger (1899). *J. Orn.* **47**: 345 [*Galerida cristata kleinschmidti*].
Eversmann (1848). *Bull. Soc. Imp. Nat. Moscou* **21(1)**: 219 [*Calandrella brachydactyla longipennis*].
Eyton (1839). *Proc. Zool. Soc. London* **1839**: 104 [*Anthus rufulus malayensis*].
Férussac (1829). *Bull. Sci. Nat. Geol.* **19**: 324 [*Tijuca, Tijuca atra*].
Finsch (1870). *Trans. Zool. Soc. London* **7**: 241 [*Anthus similis jerdoni*].
Finsch & Hartlaub (1870). *Vög. Ostafr.*: 275 [*Anthus crenatus*].
Fischer, G.A. & Reichenow (1884). *J. Orn.* **32**: 55 [*Eremopterix leucopareia*].
Fischer von Waldheim, J.G. (1810). *Descr. Obj. Rares Mus. Nat. Hist. Nat. Univ. Imp. Moscou* **1**: 1 [*Onychorynchus*].
Fitzpatrick & O'Neill (1979). *Auk* **96**: 443-444 [*Hemitriccus cinnamomeipectus*].
Fitzpatrick & Stotz (1997). *Orn. Monogr.* **48**: 38-39 [*Phylloscartes parkeri*].
Fjeldså (1990). *Bull. Brit. Orn. Club* **110(1)**: 30-31 [*Polioxolmis rufipennis bolivianus*].
Forster, J.R. (1767). *Philos. Trans.* **57**: 350 [*Melanocorypha yeltoniensis*].
Forster, T. (1817). *Syn. Cat. Brit. Birds*: 17 [*Riparia*].
Franklin (1831). *Proc. Comm. Zool. Soc. London* **1**: 119 [*Ammomanes phoenicura, Galerida cristata chendoola, Alauda gulgula*].
Fraser (1843). *Proc. Zool. Soc. London* **1843**: 27 [*Anthus leucophrys gouldii*].
Friedmann (1930). *Occas. Pap. Boston Soc. Nat. Hist.* **5**: 257 [*Mirafra pulpa*], 263 [*Macronyx croceus vulturnus*].
Friedmann (1944). *Proc. Biol. Soc. Washington* **57**: 99 [*Manacus manacus umbrosus*].
Fromholz (1913). *Orn. Monatber.* **21**: 140 [*Calandrella brachydactyla rubiginosa*].
Fry & Smith, D.A. (1985). *Ibis* **127(1)**: 2 [*Petrochelidon perdita*].
Gambel (1847). *J. Acad. Nat. Sci. Philadelphia* **1**: 40 [*Myiodynastes bairdii*].
Garnot (1829). *Voy. 'Coquille' Zool.* **1(2)**: 540 [*Muscisaxicola maclovianus*].
Garrido (1978). *Informe Cient.-Téc., Inst. Zool., Acad. Cienc. Cuba* **68**: 4 [*Contopus caribaeus nerlyi*].
Garrido, Peterson & Komar (1999). *Bull. Brit. Orn. Club* **119(2)**: 88-89 [*Petrochelidon fulva puertoricensis*].
Geoffroy Saint-Hilaire, E. (1809). *Ann. Mus. Hist. Nat. Paris* **13**: 235, 238 [*Cephalopterus*], 237 [*Gymnoderus*], 238 [*Cephalopterus ornatus*].
Gevr von Schweppenburg (1916). *Orn. Monatsber.* **24**: 59 [*Ptyonoprogne fuligula spatzi*].
Gilliard (1940). *Amer. Mus. Novit.* **1071**: 8 [*Ochthoeca diadema tovarensis*], 9 [*Pogonotriccus chapmani*].
Gilliard (1941). *Bull. Amer. Mus. Nat. Hist.* **77**: 489 [*Hemitriccus margaritaceiventer auyantepui*].
Giraud (1841). *Descr. Sixteen New Species N. Amer. Birds*: pl. 1 [*Myiozetetes similis texensis*], pl. 2 [*Empidonax fulvifrons*], 9 [*Myiarchus tuberculifer lawrenceii*].
Gloger (1829). *Isis von Oken* **22**: col. 771 [*Motacilla alba lugens*].
Gloger (1841). *Gemein. Handb.-und Hilfsb.* **1**: 320 [*Xipholena*].
Gmelin, J.F. (1788). *Syst. Nat.* **1(1)**: 301 [*Pachyramphus niger*], 302 [*Tyrannus dominicensis*], 446 [*Platyrinchus platyrhynchos, Hirundinea ferruginea*].
Gmelin, J.F. (1789). *Syst. Nat.* **1(2)**: 792 [*Lessonia rufa*], 798 [*Calandrella cinerea*], 799 [*Anthus novaeseelandiae*], 800 [*Eremophila alpestris flava*], 931 [*Tyrannus forficatus*], 933 [*Myiobius barbatus*], 934 [*Myiarchus ferox*], 937 [*Attila cinnamomeus, Attila spadiceus*], 961 [*Motacilla maderaspatensis*], 962 [*Dendronanthus indicus, Motacilla flava tschutschensis*], 969 [*Hymenops perspicillatus*], 979 [*Xenicus longipes longipes*], 1016 [*Hirundo tahitica*], 1017 [*Phedina borbonica*], 1022 [*Atticora fasciata*], 1025 [*Progne dominicensis*], 1026 [*Progne chalybea*].
Gmelin, S.G. (1774). *Reise Russl.* **3**: 101 [*Motacilla flava lutea*].
Goeldi (1905). *Compt. Rend. 6eme Congr. Int. Zool., Berne*: 549 [*Lepidothrix coronata caelestipileata*].
Gonzaga & Pacheco (1995). *Bull. Brit. Orn. Club* **115(2)**: 88-97 [*Phylloscartes beckeri*].
Goroshko (1993). *Russ. J. Orn.* **2(3)**: 317 [*Riparia diluta transbaykalica*].
Gory (1884). *Auk* **1**: 2 [*Tachycineta euchrysea sclateri*].
Gosse (1847). *Birds Jamaica*: 64 [*Petrochelidon fulva poeciloma*], 68 [*Tachycineta euchrysea*], 166 [*Contopus pallidus*], 168 [*Myiarchus stolidus*].
Gosse (1849). *Ann. and Mag. Nat. Hist.* **Ser. 2, no. 3**: 257 [*Myiopagis cotta*].
Gould (1837). *Mag. Nat. Hist. (New Ser.)* **1**: 460 [*Motacilla alba yarrellii*].
Gould (1838). *Proc. Zool. Soc. London* **1837**: 78 [*Motacilla alba leucopsis*], 126 [*Eremophila alpestris penicillata*].
Gould (1839). In: Darwin, *Zool. Voy. 'Beagle'* **9**: 8 [*Myiarchus magnirostris*], 12-13 [*Agriornis*], 39 [*Progne modesta*], 44 [*Pyrocephalus*], 45 [*Pyrocephalus rubinus nanus, Pyrocephalus rubinus obscurus*], 46 [*Pyrocephalus rubinus dubius*], 47 [*Myiophobus fasciatus auriceps*], 48 [*Myiarchus magnirostris*], 49 [*Serpophaga*], 57 [*Agriornis micropterus*]; **11**: 87 [*Eremopterix nigriceps, Ammomanes cinctura*].
Gould (1841). *Proc. Zool. Soc. London* **1840**: 172 [*Cheramoeca leucosterna*].
Gould (1843). *Proc. Zool. Soc. London* **1842**: 131 [*Hirundo neoxena*], 132 [*Petrochelidon ariel*]; **1843**: 103 [*Manacus vitellinus*].
Gould (1844). *Birds Austr.* **14**: pl. 34 [*Atrichornis clamosus*].
Gould (1847). *Proc. Zool. Soc. London* **1847**: 1 [*Mirafra javanica horsfieldii*].
Gould (1851). *Proc. Zool. Soc. London* **1850**: 92 [*Cephalopterus glabricollis*].
Gould (1856). *Proc. Zool. Soc. London* **1856**: 137 [*Hirundo tahitica subfusca*].
Gould (1857). *Proc. Zool. Soc. London* **1857**: 64 [*Cotinga amabilis*].
Gould (1858). *Proc. Zool. Soc. London* **1858**: 355 [*Notiochelidon pileata*], 356 [*Delichon dasypus cashmeriense*].
Gould (1859). *Proc. Zool. Soc. London* **1859**: 100 [*Rupicola peruvianus sanguinolentus*].
Gould (1861). *Birds Asia* **13**: pl. 63 [*Motacilla alba personata*].
Gould (1865). *Handb. Birds. Austr.* **1**: 32 [*Menura novaehollandiae victoriae*].
Grant, C.H.B. (1908). *Bull. Brit. Orn. Club* **21**: 111 [*Heteromirafra ruddi*].
Grant, C.H.B. (1913). *Bull. Brit. Orn. Club* **31**: 114 [*Heteromirafra*].
Grant, C.H.B. & Mackworth-Praed (1933). *Bull. Brit. Orn. Club* **53**: 246 [*Mirafra rufa lynesi*].
Grant, C.H.B. & Mackworth-Praed (1939). *Bull. Brit. Orn. Club* **59**: 140 [*Mirafra africana chapini*].
Grant, C.H.B. & Mackworth-Praed (1942). *Bull. Brit. Orn. Club* **62**: 54 [*Cecropis abyssinica bannermani*].
Graves (1988). *Wilson Bull.* **100(4)**: 529-531 [*Pogonotriccus lanyoni*].
Gray, G.R. (1840). *List Gen. Birds*: 31 [*Pachyramphus*], 38 [*Pyroderus*].
Gray, G.R. (1841). *List Gen. Birds*: 41 [*Machetornis*].
Gray, G.R. (1845). *Gen. Birds* **1**: pl. 20 [*Hirundo nigrita*].
Gray, G.R. (1846). *Gen. Birds* **1**: 279 [*Carpornis, Ampelioides tschudii*].
Gray, G.R. (1855). *Cat. Gen. Subgen. Birds*: 31 [*Xenicus*], 146 [*Ramphotrigon*].
Gray, G.R. (1862). *Ibis*: 219 [*Xenicus longipes stokesii*], 224 [*Anthus novaeseelandiae aucklandicus*].
Gray, J.E. (1827). In: Cuvier & Griffith, *Animal Kingdom* **6**: 335 [*Colonia*].
Gray, J.E. (1830). In: Gray & Hardwicke, *Illustr. Ind. Zool.* **1(2)**: pl. 35 [*Riparia paludicola chinensis*].
Greenway (1935). *Proc. New Engl. Zoöl. Cl.* **14**: 50 [*Mirafra javanica aliena*], 53 [*Anthus novaeseelandiae exiguus*].
Grinnell (1926). *Condor* **28**: 180 [*Sayornis saya quiescens*].
Griscom (1924). *Amer. Mus. Novit.* **141**: 5 [*Atalotriccus pilaris wilcoxi*].
Griscom (1926). *Amer. Mus. Novit.* **236**: 3 [*Elaenia martinica chinchorrensis*].
Griscom (1929). *Bull. Mus. Comp. Zool.* **69**: 179 [*Manacus vitellinus viridiventris*].
Griscom (1929). *Proc. New Engl. Zoöl. Cl.* **11**: 69 [*Stelgidopteryx ruficollis decolor*], 72 [*Stelgidopteryx serripennis psammochroa*].
Griscom (1930). *Amer. Mus. Novit.* **414**: 4 [*Megarynchus pitangua deserticola*].
Griscom (1932). *Bull. Mus. Comp. Zool.* **72**: 352 [*Rhynchocyclus brevirostris hellmayri*], 353 [*Camptostoma obsoletum majus*], 354 [*Chloropipo holochlora suffusa*], 357 [*Pachyramphus cinnamomeus fulvidior*].
Griscom (1932). *Proc. New Engl. Zoöl. Cl.* **13**: 60 [*Empidonax fulvifrons inexpectatus*].
Griscom (1934). *Bull. Mus. Comp. Zool.* **75**: 391 [*Tyrannus vociferans xenopterus*].
Griscom (1935). *Ibis*: 550 [*Elaenia frantzii ultima*].
Griscom (1935). *Occas. Pap. Boston Soc. Nat. Hist.* **8**: 200 [*Phylloscartes superciliaris palloris*].
Griscom & Greenway (1937). *Bull. Mus. Comp. Zool.* **81**: 434 [*Poecilotriccus latirostris senectus*].
Grote (1920). *Orn. Monatsber.* **28**: 98 [*Galerida modesta nigrita*].
Grote (1922). *J. Orn.* **70**: 46 [*Calendulauda sabota waibeli*].
Guérin-Méneville (1843). *Rev. Zool.*: 322 [*Cecropis abyssinica*].
Gundlach (1852). *J. Boston Soc. Nat. Hist.* **6**: 313 [*Myiarchus sagrae*].
Gyldenstolpe (1926). *Ark. Zool.* **19A(1)**: 24 [*Mirafra passerina*].
Gyldenstolpe (1941). *Ark. Zool.* **33B(12)**: 4 [*Manacus manacus expectatus*]; **33B(13)**: 5 [*Cnemotriccus fuscatus beniensis*].
Gyldenstolpe (1951). *Ark. Zool. (Ser. 2)* **2**: 229 [*Pachyramphus rufus juruanus*].
Hachisuka (1926). *Bull. Brit. Orn. Club* **47**: 23 [*Alauda arvensis lonnbergi*].
Hachisuka (1931). *Oiseau et RFO* **1**: 471 [*Mirafra javanica mindanensis*].
Hahn (1819). *Voeg. Asien, Afrika, Amerika Neuholland* **4**: pl. 4 [*Machaeropterus regulus*].
Hall, B.P. (1953). *Ibis* **95(3)**: 547 [*Cecropis striolata mayri*].
Hall, B.P. (1957). *Bull. Brit. Orn. Club* **77**: 102 [*Anthus similis yamethini*].
Hall, B.P. (1958). *Bull. Brit. Orn. Club* **78**: 153 [*Mirafra angolensis antonii*], 154 [*Mirafra angolensis marungensis*].
Hartert (1890). *J. Orn.* **38**: 156 [*Ammomanes deserti parvirostris*].
Hartert (1897). *Bull. Brit. Orn. Club* **7**: 5 [*Phylloscartes flaviventris*].
Hartert (1897). *Nov. Zool.* **4**: 144 [*Galerida theklae superflua, Galerida theklae ellioti*].
Hartert (1898). *Nov. Zool.* **5**: 487 [*Capsiempis flaveola magnirostris*], 489 [*Pipra mentalis minor, Schiffornis turdina rosenbergi*].
Hartert (1900). *Bull. Brit. Orn. Club* **11**: 39 [*Attila spadiceus parambae*], 40 [*Myiophobus phoenicomitra litae*].
Hartert (1900). *Nov. Zool.* **7**: 45 [*Mirafra africana tropicalis, Mirafra africana transvaalensis*], 46 [*Mirafra africana athi*].
Hartert (1901). *Nov. Zool.* **8**: 322 [*Motacilla cinerea canariensis*].
Hartert (1902). *Bull. Brit. Orn. Club* **12**: 43 [*Ammomanes cinctura zarudnyi*].
Hartert (1902). *Nov. Zool.* **9**: 333 [*Galerida cristata riggenbachi*], 608 [*Tolmomyias assimilis flavotectus, Mitrephanes phaeocercus berlepschi*], 609 [*Laniocera rufescens tertia*], 610 [*Lipaugus unirufus castaneotinctus*].
Hartert (1903). *Nov. Zool.* **10**: 117 [*Sapayoa, Sapayoa aenigma*].
Hartert (1904). *Vögel Pal. Fauna* **1(2)**: 210 [*Melanocorypha calandra psammochroa*], 217 [*Calandrella rufescens polatzeki*], 235 [*Galerida cristata cinnamomina, Galerida cristata tardinata*], 237 [*Galerida theklae erlangeri*].
Hartert (1905). *Bull. Brit. Orn. Club* **16**: 12 [*Rhytipterna holerythra rosenbergi*].
Hartert (1905). *Vögel Pal. Fauna* **1(3)**: 269 [*Anthus similis captus*], 271 [*Anthus berthelotii madeirensis*], 284 [*Anthus petrosus kleinschmidti*], 289 [*Motacilla flava simillima*].
Hartert (1907). *Bull. Brit. Orn. Club* **19**: 82 [*Chersomanes albofasciata erikssoni*], 83 [*Chersomanes albofasciata obscurata*], 84 [*Mirafra hypermetra gallarum*].
Hartert (1909). *Bull. Brit. Orn. Club* **25**: 9 [*Calandrella rufescens nicolli*].
Hartert (1909). *Nov. Zool.* **16**: 165 [*Anthus hellmayri*].
Hartert (1910). *Vögel Pal. Fauna* **1(6)**: 802 [*Hirundo rustica transitiva*], 809 [*Delichon urbicum meridionalis*], 810 [*Delichon dasypus nigrimentale*].
Hartert (1911). *Bull. Brit. Orn. Club* **27**: 46 [*Ammomanes deserti whitakeri*].
Hartert (1912). *Ann. and Mag. Nat. Hist.* **Ser. 8, no. 10**: 230 [*Ammomanes deserti mya*].
Hartert (1912). *Bull. Brit. Orn. Club* **29**: 63 [*Manacus manacus trinitatis*].
Hartert (1917). *Bull. Brit. Orn. Club* **37**: 56 [*Alaemon alaudipes boavistae*].
Hartert (1917). *Nov. Zool.* **24**: 457 [*Anthus similis arabicus, Anthus similis sokotrae*].
Hartert (1921). *Nov. Zool.* **28**: 112 [*Ptyonoprogne fuligula buchanani*].
Hartert (1921). *Vögel Pal. Fauna* **3(3)**: 2097 [*Motacilla flava iberiae*].
Hartert (1922). *Abh. Ber. Mus. Dresden* **15(3)**: 20 [*Alauda gulgula weigoldi*].
Hartert (1922). *Bull. Brit. Orn. Club* **43**: 12 [*Galerida cristata festae*].
Hartert (1924). *Bull. Brit. Orn. Club* **45**: 36 [*Ammomanes deserti payni*].
Hartert (1924). *Nov. Zool.* **31**: 41 [*Ammomanes deserti geyri*].
Hartert & Goodson (1917). *Nov. Zool.* **24**: 410 [*Pachyramphus xanthogenys peruanus*], 411 [*Myiopagis gaimardii trinitatis, Hirundinea ferruginea pallidior*], 412 [*Myiozetetes cayanensis hellmayri*], 414 [*Tolmomyias sulphurescens cherriei, Tolmomyias sulphurescens pallescens*], 415 [*Tolmomyias sulphurescens berlepschi*].
Hartert & Hellmayr (1902). *Bull. Brit. Orn. Club* **12**: 63 [*Platyrinchus platyrhynchos nattereri*].
Hartert & Hellmayr (1903). *Orn. Monatsber.* **11**: 35 [*Masius chrysopterus bellus*].
Hartert & Steinbacher (1933). *Vögel Pal. Fauna* **2**: 108 [*Calandrella rufescens tangutica*].
Hartlaub (1843). *Rev. Zool.* **6**: 289 [*Hemitriccus granadensis, Pyrrhomyias cinnamomeus pyrrhopterus, Ochthoeca diadema, Pachyramphus versicolor*].
Hartlaub (1844). *Rev. Zool.* **7**: [*Tyrannus savana monachus*].
Hartlaub (1849). *Rev. et Mag. Zool.* **Ser. 2, no. 1**: 275, 493 [*Pipreola formosa*].
Hartlaub (1853). *J. Orn.* **1**: 35 [*Ornithion, Ornithion inerme, Poecilotriccus fumifrons*].
Hartlaub (1855). *J. Orn.* **3**: 355 [*Psalidoprocne obscura*].
Hartlaub (1857). *Syst. Orn. West-Afr.*: 153 [*Mirafra africana occidentalis*].
Hartlaub (1858). *J. Orn.* **6**: 42 [*Hirundo lucida*].
Hartlaub (1860). *J. Orn.* **8**: 83 [*Phedina borbonica madagascariensis*], 94 [*Motacilla flaviventris*], 106 [*Mirafra hova*].
Hartlaub (1861). *J. Orn.* **9**: 11 [*Pseudochelidon*], 12 [*Pseudochelidon eurystomina*].
Hartlaub (1862). *Ibis*: 340 [*Cecropis senegalensis monteiri*].
Hartlaub (1887). *Zool. Jahrb.* **2**: 327 [*Galerida modesta bucolica*].
Hartlaub & Finsch (1870). *Vög. Ostafr.*: 143 [*Cecropis daurica domicella*].
Hawker (1898). *Bull. Brit. Orn. Club* **7**: 55 [*Mirafra cantillans marginata*].
Heine (1859). *J. Orn.* **7**: 334 [*Knipolegus aterrimus anthracinus*].
Hellmayr (1902). *Verh. Zool.-bot. Ges. Wien* **52**: 95 [*Attila bolivianus nattereri*].
Hellmayr (1903). *Verh. Zool.-bot. Ges. Wien* **53**: 200 [*Lepidothrix isidorei leucopygia*], 202 [*Scotothorus sulphureiventer, Lepidothrix nattereri gracilis*], 207 [*Tolmomyias poliocephalus sclateri*].
Hellmayr (1904). *Bull. Brit. Orn. Club* **14**: 54 [*Myiopagis caniceps parambae*].
Hellmayr (1905). *Bull. Brit. Orn. Club* **15**: 56 [*Lepidothrix coronata exquisita*], 73 [*Phyllomyias reiseri*], 90 [*Poecilotriccus fumifrons penardi*].
Hellmayr (1906). *Bull. Brit. Orn. Club* **16**: 84 [*Corapipo leucorrhoa altera*].
Hellmayr (1906). *Ibis* **8(6)**: 9 [*Pipra fasciicauda*], 44 [*Pipra stolzmanni*].
Hellmayr (1906). *Nov. Zool.* **13**: 22 [*Mionectes oleagineus pallidiventris*], 24 [*Pitangus sulphuratus trinitatis*], 318 [*Knipolegus orenocensis sclateri*], 325 [*Chloropipo holochlora litae*].
Hellmayr (1910). *Bull. Brit. Orn. Club* **25**: 87 [*Corapipo leucorrhoa heteroleuca*].
Hellmayr (1910). *Nov. Zool.* **17**: 303, 306 [*Pipra fasciicauda calamae*].
Hellmayr (1911). *Rev. Franç. d'Orn.* **2**: 24 [*Atalotriccus pilaris griseiceps*].
Hellmayr (1914). *Nov. Zool.* **21**: 167 [*Ochthoeca fumicolor berlepschi*], 170 [*Hemitriccus nidipendulus paulistus*].
Hellmayr (1915). *Verh. Orn. Ges. Bayern* **12**: 122 [*Pipra fasciicauda scarlatina*], 206 [*Pipreola riefferii chachapoyas*].
Hellmayr (1917). *Verh. Orn. Ges. Bayern* **13**: 198 [*Leptopogon taczanowskii*], 199 [*Pipreola intermedia signata, Pipreola pulchra*].
Hellmayr (1918). *Verh. Orn. Ges. Bayern* **13**: 305 [*Leptopogon superciliaris albidiventer*].
Hellmayr (1920). *Anz. Orn. Ges. Bayern* **3**: 15 [*Tachuris rubrigastra libertatis*], 16 [*Myiophobus flavicans venezuelanus*], 17 [*Xenopsaris albinucha minor*].
Hellmayr (1920). *Archiv Naturgeschichte* **85(10)**: 51 [*Anairetes parulus patagonicus*].
Hellmayr (1921). *Anz. Orn. Ges. Bayern* **4**: 30 [*Mecocerculus leucophrys roraimae*].
Hellmayr (1921). *Hornero* **2**: 186 [*Anthus correndera catamarcae*], 190 [*Anthus hellmayri brasilianus*], 191 [*Anthus hellmayri dabbenei*].
Hellmayr (1925). *Anz. Orn. Ges. Bayern* **1(9)**: 73 [*Myiarchus cephalotes caribbaeus*].
Hellmayr (1927). *Field Mus. Nat. Hist. Publ., Zool. Ser.* **13(5)**: 5 [*Agriornis montanus intermedius*], 21 [*Muscisaxicola rufivertex pallidiceps*], 39 [*Neoxolmis*], 49 [*Ochthoeca rufipectoralis centralis*], 177 [*Myiarchus ferox australis*], 194 [*Contopus cinereus pallescens*], 221 [*Cnemotriccus*], 226 [*Knipolegus poecilurus venezuelanus*], 231 [*Terenotriccus erythrurus brunneifrons*], 240 [*Myiobius atricaudus snethlagei*], 273 [*Tolmomyias*], 301 [*Todirostrum viridanum*], 325 [*Poecilotriccus ruficeps melanomystax*], 413 [*Elaenia albiceps chilensis*], 466 [*Phyllomyias fasciatus cearae*].
Hellmayr (1929). *Field Mus. Nat. Hist. Publ., Zool. Ser.* **12**: 309 [*Griseotyrannus aurantioatrocristatus pallidiventris*]; **13**: 84 [*Schiffornis turdina panamensis*], 140 [*Attila spadiceus pacificus*].
Hellmayr (1932). *Field Mus. Nat. Hist. Publ., Zool. Ser.* **19**: 126 [*Muscisaxicola cinereus argentina*].
Hellmayr & Seilern (1914). *Verh. Orn. Ges. Bayern* **12**: 89 [*Snowornis cryptolophus mindoensis*].
Hellmayr & Seilern (1915). *Verh. Orn. Ges. Bayern* **12**: 201 [*Myiarchus oberi sanctaeluciae*].
Henshaw (1884). *Auk* **1**: 258, 264 [*Eremophila alpestris praticola*], 260, 266 [*Eremophila alpestris giraudi*], 260, 267 [*Eremophila alpestris rubea*], 261, 267 [*Eremophila alpestris strigata*].
Hermann (1783). *Tab. Affin. Anim.*: 211, 214 [*Procnias averano*], 213 [*Procnias albus*], 216 [*Certhilauda curvirostris*].
Heuglin (1864). *J. Orn.* **12**: 274 [*Galerida modesta*].
Heuglin (1868). *J. Orn.* **16**: 226 [*Mirafra cantillans simplex*].
Hilgert (1907). *Orn. Monatsber.* **15**: 63 [*Galerida cristata neumanni*].
Hodgson (1836). *As. Res.* **19**: 190 [*Motacilla citreola calcarata*], 191 [*Motacilla alba alboides*].
Hodgson (1837). *J. Asiatic Soc. Bengal* **5**: 780 [*Cecropis daurica nipalensis*].
Hodgson (1845). *Proc. Zool. Soc. London* **1845**: 33 [*Anthus sylvanus*].
Homeyer (1873). *J. Orn.* **21**: 197 [*Calandrella rufescens heinei*].

Homeyer (1878). *J. Orn.* **26**: 128 [*Motacilla flava melanogrisea*].
Horsfield (1821). *Trans. Linn. Soc. London* **13(1)**: 159 [*Mirafra, Mirafra javanica*].
Horsfield (1840). *Proc. Zool. Soc. London* **1839**: 162 [*Mirafra assamica*].
Horváth (1956). *Bull. Brit. Orn. Club* **76**: 132 [*Calandrella brachydactyla hungarica*].
Howell, T.R. (1965). *Auk* **82**: 450 [*Pyrocephalus rubinus pinicola*].
Hume (1871). *Ibis*: 405 [*Calandrella raytal adamsi*], 407 [*Galerida cristata magna*].
Hume (1872). *Stray Feathers* **1**: 1 [*Ptyonoprogne fuligula pallida*], 40 [*Alauda arvensis dulcivox*].
Hume (1873). In: Henderson & Hume, *Lahore to Yarkand*: 265 [*Calandrella acutirostris*].
Hume (1873). *Stray Feathers* **1**: 483 [*Mirafra microptera*].
Ihering, H. von & Ihering, R. von (1907). *Cat. Fauna Brazil* **1**: 271 [*Phylloscartes difficilis*], 272 [*Phylloscartes paulista*].
Illiger (1811). *Prodromus Syst. Mammalium Avium*: 228 [*Procnias*].
Ingram (1906). *Bull. Brit. Orn. Club* **16**: 116 [*Mirafra javanica rufescens*].
Irwin (1957). *Bull. Brit. Orn. Club* **77**: 87 [*Eremopterix verticalis khama*], 117 [*Spizocorys conirostris crypta*].
Jackson (1899). *Ibis*: 628 [*Anthus latistriatus*].
Jackson (1904). *Bull. Brit. Orn. Club* **14**: 74 [*Hemimacronyx sharpei*].
Jardine (1849). *Contr. Orn.*: 47-49 [*Muscisaxicola alpinus*].
Jardine (1851). *Contr. Orn.*: 141 [*Cecropis semirufa gordoni*].
Jardine & Selby (1827). *Ill. Orn.* **1**: pl. 10 [*Pachyramphus castaneus*], pl. 24 [*Tityra semifasciata personata*].
Jerdon (1840). *Madras J. Lit. Sci.* **11**: 35 [*Anthus similis*].
Jerdon (1844). *Madras J. Lit. Sci.* **13**: 173 [*Hirundo tahitica domicola*].
Jerdon (1864). *Birds India* **3**: 870 [*Hirundo rustica tytleri*].
Jewett (1943). *Auk* **60**: 262 [*Eremophila alpestris alpina*].
Johansen, H.C. (1944). *J. Orn.* **92(3/4)**: 145-146 [*Anthus richardi dauricus*], 146 [*Anthus richardi ussuriensis*], 147-148 [*Anthus campestris kastschenkoi*].
Johnson & Jones (2001). *Auk* **118(2)**: 334-335 [*Poecilotriccus luluae*].
von Jordans (1935). *Orn. Monatsber.* **43**: 119 [*Galerida cristata apuliae*].
Kaup (1829). *Skizz. Entw.-Gesch. Eur. Thierw.*: 39 [*Calandrella*], 92 [*Lullula*].
Kaup (1836). *Das Thierreich* **2**: 139 [*Eremopterix*].
Kaup (1852). *Proc. Zool. Soc. London* **1851**: 44 [*Pitangus sulphuratus derbianus*], 47 [*Tityra inquisitor fraserii*], 48 [*Pachyramphus cinnamomeus tristis*], 52 [*Poecilotriccus ruficeps*].
Kaup (1853). *J. Orn.* **1**: 29 [*Knipolegus aterrimus*].
Keyserling & Blasius, J.H. (1840). *Wirbelthiere Europa's* **1**: xxvi [*Alaemon*].
Kinnear (1921). *Bull. Brit. Orn. Club* **41**: 139 [*Mirafra africana ruwenzoria*].
Kinnear (1924). *Bull. Brit. Orn. Club* **45**: 27 [*Cecropis striolata vernayi*].
Kistiakovsky (1928). *Mém. Acad. Sci. Ukraine, cl. sci. phys.* **6(3)**: 533 [*Anthus richardi centralasiae*].
Kittlitz (1830). *Mém. Acad. Imp. Sci. St. Pétersb.* **1**: 190 [*Anairetes parulus*], 191 [*Xolmis pyrope*].
Kittlitz (1835). *Mém. Acad. Imp. Sci. St. Pétersb.* **2**: 465 [*Agriornis lividus*].
Kleinschmidt (1920). *Falco* **16**: 16 [*Anthus trivialis schlueteri*].
Kleinschmidt & Hilgert (1905). *Orn. Monatsber.* **13**: 188 [*Galerida cristata carthaginis*].
Koelz (1951). *Amer. Mus. Novit.* **1510**: 2 [*Ammomanes deserti darica*].
Koepcke (1954). *Publ. Mus. Hist. Nat. Javier Prado (Ser. A)* **16**: 3 [*Zaratornis. Zaratornis stresemanni*].
Kollibay (1912). *Orn. Monatsber.* **20**: 26 [*Galerida cristata subtaurica*].
König (1888). *J. Orn.* **36**: 228 [*Chersophilus duponti margaritae*].
Kumerloeve (1963). *Vogelwelt* **84**: 147 [*Calandrella rufescens niethammeri*].
Kumerloeve (1969). *J. Orn.* **110**: 324 [*Calandrella brachydactyla woltersi*].
La Touche (1908). *Bull. Brit. Orn. Club* **23**: 17 [*Riparia diluta fohkienensis*].
Lacépède (1799). *Tabl. Méth. Mamm. Ois.*: 5 [*Tyrannus*].
Lafresnaye (1836). *Écho du Monde Savant, 3, 2nd divis.* **24**: 107 [*Tachuris*].
Lafresnaye (1836). *Mag. Zool.* **Ser. 1, no. 6**: 3 [*Chersomanes albofasciata*].
Lafresnaye (1838). *Rev. Zool.* **1**: 238 [*Schiffornis virescens*].
Lafresnaye (1839). *Mag. Zool.* **Ser. 2, no. 1**: pl. 9 [*Xipholena lamellipennis*].
Lafresnaye (1839). *Rev. Zool.* **2**: 98 [*Pachyramphus aglaiae*], 259 [*Calendulauda albescens, Calendulauda albescens guttata*].
Lafresnaye (1842). *Mag. Zool.* **Ser. 2, no. 4**: 1-2 [*Acanthisitta*].
Lafresnaye (1842). *Rev. Zool.* **5**: 335 [*Colonia colonus leuconota*].
Lafresnaye (1843). *Rev. Zool.* **6**: 68 [*Pipreola aureopectus*], 97 [*Masius chrysopterus*], 98 [*Pipreola arcuata*], 291 [*Lipaugus fuscocinereus, Pseudotriccus ruficeps, Ochthoeca cinnamomeiventris*].
Lafresnaye (1844). *Rev. Zool.* **7**: 80 [*Contopus fumigatus ardosiacus*].
Lafresnaye (1845). *Rev. Zool.* **8**: 341 [*Phyllomyias nigrocapillus, Conopias cinchoneti icterophrys*].
Lafresnaye (1846). *Rev. Zool.* **9**: 207 [*Leptopogon rufipectus*], 277 [*Pyroderus scutatus granadensis, Pyroderus scutatus orenocensis*], 361 [*Poecilotriccus plumbeiceps*], 362 [*Hemitriccus furcatus*], 363 [*Lophotriccus pileatus squamaecrista*].
Lafresnaye (1847). *Rev. Zool.* **10**: 70 [*Ochthoeca frontalis*].
Lafresnaye (1848). *Rev. Zool.* **11**: 7 [*Contopus fumigatus cineraceus*], 8 [*Ochthoeca frontalis albidiadema*], 46 [*Attila bolivianus*], 47 [*Attila spadiceus flammulatus*], 174 [*Pyrrhomyias cinnamomeus vieillotioides*].
Lafresnaye (1851). *Rev. et Mag. Zool.* **Ser. 2, no. 3**: 471 [*Pitangus sulphuratus rufipennis*], 473 [*Megarynchus pitangua mexicanus*].
Lafresnaye (1852). *Rev. et Mag. Zool.* **Ser. 2, no. 4**: 462 [*Pitangus sulphuratus guatimalensis*], 463 [*Pitangus sulphuratus bolivianus*].
Lafresnaye (1853). *Rev. et Mag. Zool.* **Ser. 2, no. 5**: 56 [*Myiozetetes cayanensis erythropterus*], 57 [*Neopelma pallescens, Myiotriccus ornatus*], 58 [*Hemitriccus striaticollis*].
Lafresnaye (1855). *Rev. et Mag. Zool.* **Ser. 2, no. 7**: 59 [*Muscisaxicola flavinucha*], 60 [*Muscisaxicola albilora*].
Lanyon, W.E. (1984). *Amer. Mus. Novit.* **2797**: 18-23 [*Griseotyrannus*], 23-24 [*Philoydor*], 24-25 [*Phelpsia*].
Lanyon, W.E. (1986). *Amer. Mus. Novit.* **2846**: 43-44, 49 [*Polioxolmis*].
Lanyon, W.E. (1988). *Amer. Mus. Novit.* **2914**: 21, 23 [*Pseudelaenia*].
Lanyon, W.E. & Lanyon, S.M. (1986). *Auk* **103(2)**: 347 [*Lathrotriccus*].
Latham (1790). *Index Orn.* **2**: 489 [*Sayornis phoebe*], 549 [*Tyrannulus elatus*], 555 [*Rupicola peruvianus*].
Latham (1801). *Index Orn.* (Suppl.): 61 [*Menura, Menura novaehollandiae novaehollandiae*].
Lavauden (1926). *Rev. Franç. d'Orn.* **10**: 6 [*Galerida cristata helenae*].
Lawrence (1851). *Ann. Lyceum Nat. Hist. New York* **5**: 121 [*Myiarchus cinerascens*].
Lawrence (1860). *Ann. Lyceum Nat. Hist. New York* **7**: 284 [*Myiarchus panamensis*].
Lawrence (1861). *Ann. Lyceum Nat. Hist. New York* **7**: 295 [*Pachyramphus cinnamomeus*], 327 [*Myiarchus tuberculifer brunneiceps*].
Lawrence (1862). *Ann. Lyceum Nat. Hist. New York* **7**: 470 [*Attila spadiceus sclateri*], 472 [*Phylloscartes flavovirens*].
Lawrence (1862). *Ibis*: 11 [*Conopias albovittatus, Myiozetetes granadensis*], 12 [*Ornithion brunneicapillus, Zimmerius vilissimus parvus, Oncostoma olivaceum*].
Lawrence (1863). *Ann. Lyceum Nat. Hist. New York* **8**: 2 [*Tachycineta albilinea*], 8 [*Tolmomyias sulphurescens flavoolivaceus*], 9 [*Sirystes sibilator albogriseus*].
Lawrence (1863). *Ibis*: 181 [*Stelgidopteryx ruficollis uropygialis*], 183 [*Myiobius atricaudus*], 184 [*Platyrinchus coronatus superciliaris*].
Lawrence (1865). *Ann. Lyceum Nat. Hist. New York* **8**: 133 [*Empidonax flavescens*], 134 [*Contopus lugubris*], 172 [*Elaenia frantzii*], 173 [*Mitrephanes phaeocercus aurantiiventris*], 176 [*Elaenia chiriquensis*], 177 [*Capsiempis flaveola semiflava*].
Lawrence (1865). *Proc. Acad. Nat. Sci. Philadelphia* **17**: 38 [*Myiarchus venezuelensis*], 106 [*Anthus lutescens parvus*].
Lawrence (1867). *Ann. Lyceum Nat. Hist. New York* **8**: 475 [*Pachyramphus aglaiae albiventris*].
Lawrence (1868). *Ann. Lyceum Nat. Hist. New York* **9**: 111 [*Mionectes olivaceus*].
Lawrence (1869). *Ann. Lyceum Nat. Hist. New York* **9**: 144 [*Phyllomyias burmeisteri zeledoni*], 237 [*Contopus cinereus punensis*], 266 [*Phyllomyias uropygialis, Mecocerculus leucophrys rufomarginatus*], 267 [*Phyllomyias plumbeiceps, Myiozetetes cayanensis rufipennis*], 268 [*Phelpsia inornata*].
Lawrence (1869). *Proc. Acad. Nat. Sci. Philadelphia* **20**: 429 [*Neopipo cinnamomea*].
Lawrence (1870). *Ann. Lyceum Nat. Hist. New York* **9**: 236 [*Lathrotriccus griseipectus*].
Lawrence (1871). *Ann. Lyceum Nat. Hist. New York* **10**: 9 [*Poecilotriccus sylvia superciliaris*], 10 [*Myiopagis gaimardii macilvainii*], 139 [*Serpophaga cinerea grisea*]; **22**: 235 [*Myiarchus yucatanensis*].
Lawrence (1871). *Proc. Acad. Nat. Sci. Philadelphia* **23**: 234 [*Sublegatus arenarum atrirostris, Myiozetetes similis grandis*].
Lawrence (1875). *Ibis*: 385 [*Myiornis atricapillus*].
Lawrence (1875). *Ann. Lyceum Nat. Hist. New York* **11**: 71-72 [*Deltarhynchus flammulatus*].
Lawrence (1876). *Ann. Lyceum Nat. Hist. New York* **11**: 288 [*Tyrannus caudifasciatus gabbii*].
Lawrence (1877). *Ann. New York Acad. Sci.* **1**: 48 [*Myiarchus oberi*].
Lawrence (1878). *Ann. New York Acad. Sci.* **1**: 161 [*Contopus latirostris brunneicapillus*].
Lawrence (1879). *Proc. US Natl. Mus.* **1**: 357 [*Myiarchus oberi sclateri*].
Lawrence (1887). *Proc. US Nat. Mus.* **9**: 617 [*Lathrotriccus euleri flaviventris*].
Laxmann (1769). *Kongl. Vet.-Acad. nya Handl.* **30**: 209 [*Cecropis daurica*].
Leach (1818). In: Tuckey, *Narr. Exped. Zaire*: 407 [*Hirundo smithii*].
Leisler (1814). *Ann. Wett. Ges.* **3**: 357 [*Calandrella brachydactyla*].
Lencioni (1996). *Rev. Bras. Biol.* **56(2)**: 197-198 [*Knipolegus nigerrimus hoflingi*].
Léotaud (1866). *Ois. Ile Trinidad*: 232 [*Cnemotriccus fuscatus cubanisi*].
Lesson (1828). *Voy. 'Coquille' Zool.* **1**: 239 [*Hymenops*].
Lesson (1830). *Traité d'Orn.*: 360 [*Attila*], 363 [*Pachyramphus minor*], 392 [*Corythopis delalandi*].
Lesson (1831). *Cent. Zool.*: 81 [*Iodopleura pipra*].
Lesson (1831). *Traité d'Orn.*: 384 [*Todirostrum*], 387 [*Muscipipra*].
Lesson (1839). *Rev. Zool.* **2**: 45 [*Iodopleura*], 101 [*Anthus correndera chilensis*].
Lesson (1840). *Rev. Zool.* **3**: 353 [*Laniocera*].
Lesson (1842). *Rev. Zool.* **5**: 174 [*Chiroxiphia linearis fastuosa*].
Lesson (1844). *Écho du Monde Savant* **11(7)**: 156 [*Lipaugus lanioides*]; **11(10)**: 233 [*Ochthoeca rufipectoralis rufopectus*].
Lichtenstein, M.H.K. (1823). *Verz. Doubl. Zool. Mus. Berlin*: 28 [*Antilophia galeata, Eremopterix leucotis melanocephalus, Ammomanes deserti*], 49 [*Pitangus lictor*], 50 [*Pachyramphus validus, Tityra inquisitor*], 51 [*Pachyramphus marginatus*], 53 [*Muscipipra vetula, Rhytipterna simplex*], 54 [*Xolmis velatus*], 55 [*Mionectes oleagineus, Tyrannus melancholicus despotes*], 56 [*Capsiempis flaveola*].
Lichtenstein, M.H.K. (1842) *Verz. Säug. Vög. Kaffernl.*: 13 [*Hemimacronyx chloris*], 18 [*Ptyonoprogne fuligula*].
Lillo (1905). *Rev. Letr. Cienc. Soc.* **3**: 48 [*Pseudocolopteryx, Pseudocolopteryx dinelliana*].
Linnaeus (1758). *Syst. Nat.* **10**: 94 [*Phoenicircus carnifex, Tyrannus tyrannus*], 108 [*Gymnoderus foetidus*], 165 [*Alauda, Alauda arvensis*], 166 [*Eremophila alpestris, Galerida cristata, Lullula arborea, Anthus campestris, Anthus pratensis, Anthus trivialis, Anthus spinoletta*], 170 [*Myiarchus crinitus*], 184 [*Motacilla*], 185 [*Motacilla alba, Motacilla flava*], 190 [*Dixiphia pipra pipra*], 191 [*Pipra aureola aureola, Pipra erythrocephala erythrocephala, Hirundo, Hirundo rustica*], 192 [*Riparia riparia, Progne subis, Delichon urbicum*].
Linnaeus (1764). *Mus. Adolphi Friderici* **2**: 32 [*Pipra*], 33 [*Arundinicola leucocephala*].
Linnaeus (1766). *Syst. Nat.* **12**: 135 [*Fluvicola nengeta*], 136 [*Megarynchus pitangua*], 137 [*Tityra cayana, Pitangus sulphuratus*], 178 [*Todirostrum cinereum*], 288 [*Melanocorypha calandra, Macronyx capensis*], 298 [*Cotinga maynana, Cotinga cotinga, Cotinga cayana*], 325 [*Elaenia martinica, Pachyramphus surinamus*], 327 [*Contopus virens, Myiozetetes cayanensis*], 333 [*Motacilla capensis*], 338 [*Rupicola rupicola*], 339 [*Chiroxiphia pareola*], 340 [*Lepidothrix serena, Corapipo gutturalis, Manacus manacus*], 345 [*Progne tapera, Cecropis senegalensis*].
Liversidge (1996). *Bull. Brit. Orn. Club* **116**: 211 [*Anthus longicaudatus*].
Liversidge & Voelker (2002). *Bull. Brit. Orn. Club* **122**: 93 [*Anthus pseudosimilis*].
Loche (1860). *Rev. et Mag. Zool.* **Ser. 2, no. 12**: 150 [*Galerida cristata randoni*].
Lönnberg (1908). *J. Coll. Sci. Imp. Univ. Tokyo* **23(14)**: 38 [*Riparia riparia ijimae*].
Lorenz-Liburnau (1902). *Ann. K. K. Naturh. Hofmus. Wien* **17**: 309 [*Anthus novaeseelandiae chathamensis*].
Loskot (2001). *Zoosyst. Ross.* **9**: 461-462 [*Riparia diluta gavrilovi*].
Loudon & Zarudny (1903). *Orn. Jahrb.* **14**: 171 [*Galerida cristata iwanowi*].
Lowery & O'Neill (1966). *Auk* **83**: 2 [*Conioptilon*], 3 [*Conioptilon mcilhennyi*].
Lynes (1914). *Bull. Brit. Orn. Club* **33**: 129 [*Mirafra rufocinnamomea sobatensis*].
Lynes (1920). *Bull. Brit. Orn. Club* **41**: 15 [*Mirafra rufa*], 16 [*Anthus similis jebelmarrae*].
Lynes (1923). *Bull. Brit. Orn. Club* **43**: 95 [*Mirafra africana kurrae, Mirafra rufocinnamomea furensis*].
Macdonald (1940). *Bull. Brit. Orn. Club* **60**: 59 [*Mirafra hypermetra kidepoensis*].
Macdonald (1952). *Ann. Transvaal Mus.* **22(1)**: 32 [*Calandrella cinerea niveni*].
Macdonald (1953). *Bull. Brit. Mus. (Nat. Hist.)* **1(11)**: 344 [*Calendulauda barlowi patae, Calendulauda barlowi cavei*].
Macdonald (1956). *Bull. Brit. Orn. Club* **76**: 71 [*Mirafra williamsi*].
Mathews (1912). *Austr. Av. Rec.* **1**: 102 [*Mirafra javanica melvillensis*].
Mathews (1912). *Nov. Zool.* **18**: 300 [*Hirundo neoxena carteri*], 301 [*Petrochelidon nigricans neglecta*], 424 [*Anthus novaeseelandiae bilbali*].
Mathews (1913). *Austr. Av. Rec.* **1**: 193 [*Anthus novaeseelandiae rogersi*].
Mathews (1921). *Austr. Av. Rec.* **4**: 137 [*Mirafra javanica soderbergi*].
Mathews & Iredale (1913). *Ibis* **Ser. 10, no. 1**: 432 [*Acanthisitta chloris granti*].
Mayr (1931). *Mitt. Zool. Mus. Berlin* **17**: 692 [*Anthus gutturalis rhododendri*].
Mayr (1934). *Amer. Mus. Novit.* **709**: 12 [*Hirundo tahitica ambiens*].
Mayr (1941). *Ibis* **14(5)**: 365 [*Delichon nipalense cuttingi*], 367 [*Cecropis striolata stanfordi*], 375 [*Alauda gulgula vernayi*].
Mayr (1944). *Bull. Amer. Mus. Nat. Hist.* **83**: 154 [*Mirafra javanica timorensis*].
Mayr & McEvey (1960). *Emu* **60**: 166 [*Mirafra javanica forresti*].
McCall (1851). *Proc. Acad. Nat. Sci. Philadelphia* **5**: 218 [*Eremophila alpestris occidentalis*].
McConnell (1911). *Bull. Brit. Orn. Club* **27**: 105 [*Neopipo cinnamomea helenae*], 106 [*Rhynchocyclus olivaceus guianensis*].
Meade-Waldo (1901). *Bull. Brit. Orn. Club* **12**: 27 [*Riparia puludicola mauritanica, Motacilla alba subpersonata*].
Meinertzhagen (1919). *Bull. Brit. Orn. Club* **39**: 84 [*Melanocorypha calandra gaza*].
Meinertzhagen (1920). *Bull. Brit. Orn. Club* **41**: 21 [*Galerida cristata zion, Melanocorypha calandra hebraica*], 22 [*Anthus cinnamomeus lacuum*], 23 [*Anthus similis decaptus, Anthus vaalensis goodsoni, Anthus vaalensis neumanni*].
Meinertzhagen (1921). *Ibis*: 656 [*Anthus cinnamomeus annae*].
Meinertzhagen (1923). *Bull. Brit. Orn. Club* **43**: 147 [*Ammomanes deserti annae*], 157 [*Ammomanes deserti cheesmani*], 156 [*Eremalauda dunni eremodites*].
Meinertzhagen (1923). *Bull. Brit. Orn. Club* **44**: 15 [*Ammomanes deserti coxi*].
Meinertzhagen (1939). *Bull. Brit. Orn. Club* **59**: 65 [*Galerida theklae theresae*].
Meinertzhagen, R. & Meinertzhagen, A. (1926). *Bull. Brit. Orn. Club* **46**: 100 [*Alauda gulgula lhamarum*].
Meise (1933). *Orn. Monatsber.* **41**: 81 [*Calandrella rufescens beicki*].
Meise (1934). *Abh. Ber. Mus. Dresden* **18(2)**: 46 [*Hirundo rustica mandschurica*].
Meise (1937). *J. Orn.* **85**: 491 [*Calandrella rufescens stegmanni*].
Ménétriés (1832). *Cat. Raisonné Objects Zool. Voyage Caucase*: 37 [*Melanocorypha bimaculata*].
Meyer de Schauensee (1931). *Proc. Acad. Nat. Sci. Philadelphia* **83**: 5 [*Chersomanes albofasciata boweni*].
Meyer de Schauensee (1942). *Not. Nat. Philadelphia* **98**: 1 [*Muscisaxicola alpinus quesadae*].
Meyer de Schauensee (1945). *Proc. Acad. Nat. Sci. Philadelphia* **97**: 46 [*Hemitriccus granadensis lehmani*], 52 [*Dixiphia pipra unica*].
Meyer de Schauensee (1950). *Not. Nat. Philadelphia* **221**: 11 [*Pachyramphus homochrous quimarinus, Laniocera rufescens griseigula*], 12 [*Dixiphia pipra bolivari*], 13 [*Rhynchocyclus olivaceus mirus*].
Meyer de Schauensee (1951). *Not. Nat. Philadelphia* **234**: 8 [*Myiophobus lintoni*].
Meyer de Schauensee (1952). *Proc. Acad. Nat. Sci. Philadelphia* **104**: 21 [*Masius chrysopterus pax*].
Meyer de Schauensee (1953). *Proc. Acad. Nat. Sci. Philadelphia* **105**: 30 [*Lepidothrix coronata caquetae*], 37 [*Pipreola arcuata viridicauda*].
Meyer de Schauensee & Ripley (1953). *Proc. Acad. Nat. Sci. Philadelphia* **105**: 83 [*Ammomanes deserti taimuri*].
Michahelles (1830). *Isis von Oken* **23**: col. 812 [*Motacilla flava feldegg*].
Miller, W. deW. (1908). *Bull. Amer. Mus. Nat. Hist.* **24**: 338 [*Chiroxiphia pareola napensis*].
Miller, W. deW. & Griscom (1925). *Amer. Mus. Novit.* **159**: 3 [*Pachyramphus major australis*], 5 [*Empidonax albigularis australis, Contopus pertinax minor*], 6 [*Myiarchus tuberculifer connectens*].
Milligan (1901). *Victorian Naturalist* **18**: 25-26 [*Mirafra javanica woodwardi*].
Miranda-Ribeiro (1906). *Arch. Mus. Nac. Rio J.* **13**: 183 [*Hemitriccus obsoletus*].
Molina (1782). *Sagg. Stor. Nat. Chili*: 254 [*Phytotoma rara*], 254, 345 [*Phytotoma*].
Montagu (1798). *Trans. Linn. Soc. London* **4**: 41 [*Anthus petrosus*].
Moore, F. (1854). *Cat. Birds Mus. Hon. East-India Co.* **1**: 104 [*Delichon nipalense*], 384 [*Delichon*].
Moore, F. (1856). *Proc. Zool. Soc. London* **1855**: 215 [*Eremophila alpestris longirostris*].
Moore, R.T. (1941). *Proc. Biol. Soc. Washington* **54**: 35 [*Megarynchus pitangua tardiusculus*].
Nelson (1897). *Auk* **14**: 52 [*Pachyramphus aglaiae sumichrasti*], 53 [*Empidonax occidentalis*], 54 [*Eremophila alpestris oaxacae*].
Nelson (1898). *Proc. Biol. Soc. Washington* **12**: 9 [*Myiopagis viridicata minima*], 59 [*Progne sinaloae*].

Nelson (1899). *Auk* **16**: 28 [*Pachyramphus major uropygialis*].
Nelson (1900). *Auk* **17**: 263 [*Empidonax albigularis timidus*], 264 [*Myiopagis viridicata jaliscensis*].
Nelson (1901). *Auk* **18**: 47 [*Empidonax affinis trepidus*].
Nelson (1901). *Proc. Biol. Soc. Washington* **14**: 173 [*Pachyramphus major itzensis*], 174 [*Stelgidopteryx serripennis ridgwayi*].
Nelson (1902). *Proc. Biol. Soc. Washington* **15**: 211 [*Petrochelidon fulva pallida*].
Nelson (1904). *Proc. Biol. Soc. Washington* **17**: 47 [*Myiarchus tuberculifer querulus*], 152 [*Empidonax fulvifrons fusciceps*].
Nelson (1912). *Smiths. Misc. Coll.* **60(3)**: 15 [*Aphanotriccus audax*].
Nelson (1913). *Smiths. Misc. Coll.* **60(21)**: 1 [*Pseudotriccus pelzelni berlepschi*].
Neumann (1904). *Orn. Monatsber.* **12**: 143 [*Hirundo lucida rothschildi*], 144 [*Psalidoprocne nitens centralis*, *Psalidoprocne pristoptera oleaginea*, *Psalidoprocne pristoptera reichenowi*, *Psalidoprocne pristoptera massaica*].
Neumann (1906). *J. Orn.* **54**: 233 [*Anthus nyassae*, *Anthus similis hararensis*], 235 [*Anthus leucophrys zenkeri*, *Anthus leucophrys omoensis*, *Anthus vaalensis saphiroi*], 236 [*Anthus leucophrys bohndorffi*], 239 [*Calandrella erlangeri*].
Neumann (1908). *Bull. Brit. Orn. Club* **23**: 45 [*Mirafra africana harterti*, *Galerida cristata alexanderi*].
Neumann (1928). *J. Orn.* **76**: 787 [*Mirafra rufocinnamomea omoensis*].
Neumann (1929). *Orn. Monatsber.* **37**: 176 [*Motacilla capensis simplicissima*].
Nicholson (1878). *Proc. Zool. Soc. London* **1878**: 390 [*Anthus lutescens peruvianus*].
Nicholson (1884). *Ibis*: 469 [*Anthus cinnamomeus bocagei*].
Nicoll (1904). *Ibis*: 582 [*Tyrannus caudifasciatus caymanensis*].
Nicoll (1920). *Bull. Brit. Orn. Club* **41**: 25 [*Anthus campestris griseus*].
Nicoll (1921). *Bull. Brit. Orn. Club* **42**: 7 [*Galerida cristata halfae*].
Niethammer (1955). *Bonn. Zool. Beitr.* **6**: 57 [*Galerida cristata jordansi*], 59 [*Ammomanes deserti kollmanspergeri*], 185 [*Ammomanopsis grayi hoeschi*].
Niethammer (1957). *J. Orn.* **98**: 449 [*Anthus cinnamomeus grotei*].
Nores & Yzurieta (1979). *Acad. Nat. Cienc. Cordoba Misc.* **61**: 7 [*Xolmis salinarum*].
Novaes (1953). *Rev. Bras. Biol.* **13**: 235 [*Poecilotriccus plumbeiceps cinereipectus*].
Novaes (1964). *Bol. Mus. Goeldi, Zool. (New Ser.)* **47**: 1 [*Piprites chloris grisescens*].
Novaes (1968). *Rev. Bras. Biol.* **28**: 115 [*Platyrinchus saturatus pallidiventris*].
Nuttall (1831). *Man. Orn. US & Can. (Ed. 1)* **1**: 282 [*Contopus cooperi*].
O'Neill & Parker (1976). *Bull. Brit. Orn. Club* **96**: 140 [*Anairetes agraphia squamigerus*].
O'Neill & Parker (1981). *Bull. Brit. Orn. Club* **101(2)**: 294 [*Pipreola riefferii tallmanorum*].
Oberholser (1897). *Auk* **14**: 300 [*Empidonax difficilis insulicola*].
Oberholser (1899). *Proc. Acad. Nat. Sci. Philadelphia* **51**: 209 [*Perissocephalus*].
Oberholser (1902). *Proc. US Natl. Mus.* **23**: 807, 817 [*Eremophila alpestris enthymia*]; **24**: 806, 816 [*Eremophila alpestris arcticola*], 806, 829 [*Eremophila alpestris diaphora*], 806, 845 [*Eremophila alpestris actia*], 806, 849 [*Eremophila alpestris ammophila*], 806, 860 [*Eremophila alpestris aphrasta*], 806, 864 [*Eremophila alpestris leucansiptila*], 806, 871 [*Eremophila alpestris argalea*]; **25**: 66 [*Sirystes sibilator atimastus*].
Oberholser (1903). *Proc. Biol. Soc. Washington* **16**: 15 [*Petrochelidon pyrrhonota tachina*].
Oberholser (1907). *Proc. Biol. Soc. Washington* **20**: 41 [*Eremophila alpestris enertera*].
Oberholser (1918). *Ohio J. Sci.* **18**: 93 [*Empidonax traillii brewsteri*].
Oberholser (1920). *Condor* **22**: 34 [*Eremophila alpestris sierrae*].
Oberholser (1932). *Sci. Publ. Cleveland Mus. Nat. Hist.* **4(1)**: 3 [*Empidonax traillii adastus*], 4 [*Eremophila alpestris lamprochroma*].
Ogilvie-Grant (1900). *Bull. Brit. Orn. Club* **11**: 30 [*Eremopterix signatus harrisoni*].
Ogilvie-Grant (1900). *Nov. Zool.* **7**: 249 [*Ammomanes deserti saturata*].
Ogilvie-Grant (1906). *Bull. Brit. Orn. Club* **19**: 26 [*Anthus brachyurus leggei*].
Ogilvie-Grant (1911). *Bull. Brit. Orn. Club* **29**: 30 [*Motacilla capensis wellsi*].
Ogilvie-Grant (1912). *Ibis* **9(6)**: 375 [*Chersomanes albofasciata kalahariae*].
Ogilvie-Grant (1913). *Bull. Brit. Orn. Club* **31**: 105 [*Anthus gutturalis wollastoni*].
Olivares (1965). *Caldasia* **9**: 269 [*Poecilotriccus latirostris mituense*].
Olrog (1949). *Acta Zool. Lilloana* **8**: 212 [*Muscisaxicola flavinucha brevirostris*].
d'Orbigny (1839). In: Sagra. *Hist. Fis. Pol. y Nat. de la Isla de Cuba. Aves*: 70 [*Tyrannus caudifasciatus*], 92 [*Contopus caribaeus*].
d'Orbigny (1840). *Voy. Am. Mérid.* **4(3)**: 326 [*Myiopagis gaimardii*], 328 [*Zimmerius bolivianus*], 334 [*Arundinicola*], 336 [*Suiriri*], 351 [*Agriornis micropterus andecola*].
d'Orbigny & Lafresnaye (1837). *Mag. Zool.* **7(2)**: 27 [*Anthus furcatus*], 37 [*Phytotoma rutila angustirostris*], 39 [*Ampelion rubrocristatus*], 43 [*Contopus fumigatus*, *Myiarchus tuberculifer*], 45 [*Griseotyrannus aurantioatrocristatus*], 46 [*Hemitriccus margaritaceiventer*, *Hirundinea*], 47 [*Elaenia albiceps*, *Myiornis ecaudatus*], 48 [*Elaenia obscura*, *Cnemotriccus fuscatus bimaculatus*], 49 [*Sublegatus modestus brevirostris*, *Pyrrhomyias cinnamomeus*], 51 [*Mionectes striaticollis*], 52 [*Phylloscartes ventralis angustirostris*], 53 [*Mecocerculus leucophrys*], 55 [*Pseudocolopteryx flaviventris*], 56 [*Stigmatura budytoides*], 57 [*Anairetes reguloides*], 60 [*Ochthoeca rufipectoralis*, *Ochthoeca oenanthoides*, *Ochthoeca leucophrys*], 61 [*Muscigralla*, *Muscigralla brevicauda*], 63 [*Agriornis murinus*], 64 [*Agriornis montanus*], 65 [*Agriornis montanus maritimus*, *Muscisaxicola*], 66 [*Knipolegus striaticeps*, *Muscisaxicola maculirostris*, *Muscisaxicola rufivertex*, *Muscisaxicola maclovianus mentalis*], 69 [*Notiochelidon cyanoleuca patagonica*, *Haplochelidon andecola*].
Oren & Novaes (1985). *Bull. Brit. Orn. Club* **105(1)**: 24 [*Procnias albus wallacei*].
Oustalet (1886). *Bibl. École Haut. Étud.* **31**: 9 [*Eremopterix signatus*].
Oustalet (1886). *Naturaliste* **8**: 300 [*Phedina brazzae*].
Oustalet (1892). *Naturaliste* **14**: 231 [*Mirafra rufocinnamomea tigrina*].
Oustalet (1892). *Nouv. Arch. Mus. Hist. Nat. Paris* **4**: 217 [*Pseudocolopteryx sclateri*].
Pallas (1764). In: Vroeg. *Cat. Raisonné Coll. Oiseaux, Adumbr.*: 2 [*Xipholena punicea*].
Pallas (1776). *Reise Verschiedene Provinzen Russischen Reichs* **3**: 696 [*Motacilla citreola*, *Motacilla cinerea melanope*], 697 [*Melanocorypha mongolica*].
Pallas (1811). *Zoographia Rosso-Asiat.* **1**: 511 [*Anthus cervinus*], 518 [*Melanocorypha leucoptera*], 532 [*Delichon urbicum lagopodum*].
Parkes (1963). *Ann. Carnegie Mus.* **36**: 131 [*Tyrannus caudifasciatus flavescens*].
Parkes (1976). *Nemouria, Occas. Pap. Delaware Mus. Nat. Hist.* **18**: 3 [*Todirostrum cinereum virididorsale*], 5 [*Todirostrum cinereum wetmorei*].
Parkes (1982). *Ann. Carnegie Mus.* **51(1)**: 6-7 [*Myiarchus tyrannulus cozumelae*], 9-10 [*Myiarchus tuberculifer manens*].
Parkes & Panza (1993). *Bull. Brit. Orn. Club* **113(1)**: 22 [*Terenotriccus erythrurus purusianus*].
Parkes & Phillips, A.R. (1967). *Condor* **69**: 80 [*Myiarchus yucatanensis lanyoni*].
Parzudaki (1841). *Rev. Zool.* **4**: 306 [*Manacus candei*].
Parzudaki (1847). *Rev. Zool.* **10**: 186 [*Iodopleura isabellae*].
Paterson (1958). *Bull. Brit. Orn. Club* **78**: 126 [*Calandrella cinerea millardi*].
Peale (1848). *US Expl. Exped.* **8**: 175 [*Petrochelidon rufocollaris*].
Pelzeln (1858). *Sitzungsb. K. Akad. Wiss. Wien, Math.-naturwiss. Kl.* **31**: 325-326 [*Onychorynchus coronatus swainsoni*].
Pelzeln (1867). *Verh. Zool.-bot. Ges. Wien* **17**: 316 [*Xenicus gilviventris*].
Pelzeln (1868). *Orn. Bras.* **2**: 101, 172 [*Todirostrum chrysocrotaphum guttatum*], 101, 173 [*Poecilotriccus senex*, *Poecilotriccus latirostris*], 102, 173 [*Hemitriccus zosterops*], 102, 174 [*Hemitriccus inornatus*], 103, 174 [*Euscarthmus rufomarginatus*], 107, 176 [*Elaenia spectabilis*], 107, 177 [*Elaenia cristata*, *Elaenia chiriquensis albivertex*], 107, 178 [*Elaenia parvirostris*], 108, 179 [*Elaenia ruficeps*], 108, 180 [*Myiopagis caniceps cinerea*, *Ochthornis littoralis*], 110, 181 [*Tolmomyias assimilis*], 111, 181 [*Conopias parvus*], 116, 181 [*Knipolegus poecilocercus*], 125, 185 [*Heteropelma chrysocephalum*], 125, 186 [*Heterocercus flavivertex*], 128, 187 [*Tyranneutes virescens*], 171 [*Attila phoenicurus*].
Penard, F.P. & Penard, A.P. (1910). *Vög. Guyana* **2**: 259 [*Contopus cinereus surinamensis*].
Phelps, Jr (1977). *Bol. Soc. Venez. Cienc. Nat.* **33(134)**: 33 [*Hemitriccus margaritaceiventer breweri*].
Phelps, Sr & Gilliard (1941). *Amer. Mus. Novit.* **1153**: 5 [*Ramphotrigon megacephalum venezuelensis*], 6 [*Mecocerculus stictopterus albocaudatus*], 7 [*Machaeropterus striolatus obscurostriatus*], 8 [*Machaeropterus striolatus aureopectus*], 9 [*Laniisoma elegans venezuelense*].
Phelps, Sr & Phelps, Jr (1946). *Bol. Soc. Venez. Cienc. Nat.* **65-66**: 156 [*Sublegatus arenarum tortugensis*].
Phelps, Sr & Phelps, Jr (1948). *Bol. Soc. Venez. Cienc. Nat.* **71**: 66 [*Machetornis rixosa obscurodorsalis*].
Phelps, Sr & Phelps, Jr (1949). *Proc. Biol. Soc. Washington* **62**: 38 [*Pipreola formosa pariae*], 39 [*Pyrrhomyias cinnamomeus pariae*], 117 [*Knipolegus poecilurus paraquensis*], 187 [*Piprites chloris perijana*], 188 [*Pachyramphus castaneus parui*].
Phelps, Sr & Phelps, Jr (1950). *Proc. Biol. Soc. Washington* **63**: 120 [*Hemitriccus granadensis federalis*], 121 [*Mecocerculus leucophrys parui*].
Phelps, Sr & Phelps, Jr (1951). *Proc. Biol. Soc. Washington* **64**: 68 [*Pogonotriccus chapmani duidae*].
Phelps, Sr & Phelps, Jr (1952). *Proc. Biol. Soc. Washington* **65**: 50 [*Mionectes oleagineus dorsalis*], 91 [*Machaeropterus striolatus zulianus*], 93 [*Platyrinchus flavigularis vividus*], 94 [*Hemitriccus granadensis intensus*], 95 [*Phylloscartes superciliaris griseocapillus*].
Phelps, Sr & Phelps, Jr (1953). *Proc. Biol. Soc. Washington* **66**: 8 [*Myiotheretes fumigatus olivaceus*], 135 [*Pachyramphus albogriseus coronatus*].
Phelps, Sr & Phelps, Jr (1954). *Proc. Biol. Soc. Washington* **67**: 109 [*Platyrinchus mystaceus perijanus*], 110 [*Zimmerius improbus tamae*].
Phelps, Sr & Phelps, Jr (1955). *Proc. Biol. Soc. Washington* **68**: 54 [*Pachyramphus cinnamomeus badius*], 55 [*Mionectes oleagineus abdominalis*], 117 [*Platyrinchus mystaceus ventralis*].
Phelps, Sr & Phelps, Jr (1957). *Proc. Biol. Soc. Washington* **70**: 122 [*Myiophobus flavicans perijanus*].
Philippi [Bañados], R.A. & Johnson (1946). In: Goodall, Johnson & Philippi. *Aves de Chile* **1**: 152 [*Xolmis pyrope fortis*], 183 [*Tachuris rubrigastra loaensis*].
Philippi [Krumwiede], R.A. (1857). *Archiv Naturgeschichte* **23(1)**: 265 [*Anairetes fernandezianus*].
Philippi [Krumwiede], R.A. (1902). *An. Mus. Nac. Chile, Zool.* **15**: 23 [*Tachycineta stolzmanni*].
Philippi [Krumwiede], R.A. & Landbeck (1863). *Archiv Naturgeschichte* **29(1)**: 132 [*Agriornis andicola albicauda*].
Philippi [Krumwiede], R.A. & Landbeck (1864). *Anales Univ. Chile* **25**: 422 [*Muscisaxicola cinereus*].
Phillips, A.R. (1939). *Auk* **56**: 311 [*Empidonax oberholseri*].
Phillips, A.R. (1942). *Auk* **59**: 425, 426 [*Empidonax affinis vigensis*].
Phillips, A.R. (1948). *Auk* **65**: 512 [*Empidonax traillii extimus*].
Phillips, A.R. (1966). *Bull. Brit. Orn. Club* **86**: 107 [*Pachyramphus major matudai*, *Myiozetetes similis hesperis*], 108 [*Empidonax fulvifrons brodkorbi*].
Phillips, A.R. (1970). *Bull. Brit. Orn. Club* **90**: 115 [*Eremophila alpestris lactea*].
Phillips, A.R. (1986). *Known Birds North & Middle America*: 12 [*Progne chalybea warneri*], 23 [*Stelgidopteryx serripennis burleighi*], 34 [*Petrochelidon pyrrhonota ganieri*].
Phillips, E.L. (1897). *Bull. Brit. Orn. Club* **6**: xlvi [*Pseudalaemon fremantlii*].
Phillips, E.L. (1898). *Ibis* **7(4)**: 400 [*Pseudalaemon*].
Pinto (1935). *Rev. Mus. Paulista* **19**: 212 [*Myiozetetes similis pallidiventris*], 231 [*Attila rufus hellmayri*].
Pinto (1944). *Cat. Aves Brasil* **2**: 100 [*Neopelma aurifrons chrysolophum*].
Pinto (1954). *Pap. Avuls. Dept. Zool. São Paulo* **12**: 63 [*Schiffornis turdina intermedia*], 71 [*Platyrinchus mystaceus niveigularis*].
Prigogine (1982). *Gerfaut* **71**: 565 [*Anthus cinnamomeus itombwensis*].
Prum (2001). *Ibis* **143**: 307-309 [*Snowornis*].
Przevalski (1876). *Mongol. i Strana Tangut.* **2**: 103 [*Eremophila alpestris nigrifrons*], 105 [*Calandrella rufescens kukunoorensis*].
Przevalski (1887). *Zapiski Imp. Akad. Nauk, St. Pétersbourg* **55**: 85 [*Motacilla flava leucocephala*], 93 [*Eremophila alpestris teleschowi*].
Pucheran (1855). *Arch. Mus. Hist. Nat. Paris* **7**: 334 [*Corythopis torquatus anthoides*], 343 [*Anthus lutescens*].
Quickelberge (1967). *Ann. Cape Prov. Mus. (Nat. Hist.)* **6**: 43 [*Certhilauda semitorquata algida*].
Quoy & Gaimard (1830). *Voy. 'Astrolabe', Zool.* **1**: 204 [*Hirundo tahitica frontalis*].
Ramsay, E.P. (1867). *Proc. Zool. Soc. London* **1866**: 438 [*Atrichornis rufescens rufescens*].
Ramsay, R.G.W. (1886). *Ibis*: 160 [*Mirafra javanica philippinensis*].
Reichenbach (1850). *Av. Syst. Nat.*: pl. 63 [*Antilophia*, *Ilicura*, *Dixiphia*], pl. 65 [*Rhytipterna*], pl. 66 [*Anairetes*, *Myiotheretes*], pl. 67 [*Polystictus*, *Myiophobus*], pl. 87 [*Ptyonoprogne*].
Reichenow (1878). *J. Orn.* **26**: 266 [*Mirafra rufocinnamomea fischeri*].
Reichenow (1879). *Orn. Centralbl.* **1**: 155 [*Calendulauda poecilosterna*, *Mirafra hypermetra*].
Reichenow (1887). *J. Orn.* **35**: 300 [*Riparia congica*].
Reichenow (1889). *J. Orn.* **37**: 277 [*Psalidoprocne pristoptera orientalis*].
Reichenow (1891). *J. Orn.* **39**: 222 [*Macronyx aurantiigula*], 223 [*Mirafra albicauda*].
Reichenow (1892). *J. Orn.* **40**: 215 [*Cecropis daurica emini*], 442 [*Psalidoprocne pristoptera chalybea*].
Reichenow (1895). *Orn. Monatsber.* **3**: 42 [*Eremophila alpestris balcanica*], 96 [*Calendulauda alopex intercedens*].
Reichenow (1898). *Orn. Monatsber.* **6**: 115 [*Petrochelidon preussi*].
Reichenow (1900). *Orn. Monatsber.* **8**: 39 [*Macronyx fuellebornii*, *Mirafra africana nigrescens*].
Reichenow (1902). *Orn. Monatsber.* **10**: 78 [*Eremopterix leucotis madaraszi*].
Reichenow (1903). *Vög. Afr.* **2(2)**: 404 [*Hirundo dimidiata marwitzi*].
Reichenow (1904). *J. Orn.* **52**: 307 [*Ammomanes deserti erythrochroa*].
Reichenow (1904). *Vög. Afr.* **3(1)**: 349, 354 [*Chersomanes albofasciata arenaria*], 374, 378 [*Calandrella cinerea saturatior*].
Reichenow (1905). *J. Orn.* **53**: 673 [*Riparia cincta erlangeri*].
Reichenow (1905). *Orn. Monatsber.* **13**: 179 [*Anthus similis nivescens*].
Reichenow (1905). *Vög. Afr.* **3(2)**: 828 [*Ptyonoprogne fuligula arabica*], 829 [*Hirundo lucida subalaris*].
Reichenow (1907). *J. Orn.* **55**: 49 [*Galerida cristata somaliensis*].
Reichenow (1908). *Orn. Monatsber.* **16**: 81 [*Riparia paludicola ducis*].
Reichenow (1910). *Orn. Monatsber.* **18**: 191 [*Galerida modesta struempelli*].
Reichenow (1915). *Orn. Monatsber.* **23**: 155 [*Anthus similis leucocraspedon*].
Reichenow (1916). *J. Orn.* **64**: 161 [*Certhilauda curvirostris falcirostris*].
Reichenow (1920). *J. Orn.* **68**: 88 [*Riparia paludicola schoensis*].
Reichenow & Peters, J.L. (1932). *Mitt. Zool. Mus. Hamburg* **45**: 23 [*Calandrella blanfordi eremica*].
Reinhardt (1870). *Vidensk. Medd. Dan. Naturhist. Foren.*: 337 [*Hirundinea ferruginea sclateri*].
Reischek (1889). *Trans. New Zealand Inst.* **21**: 388 [*Anthus novaeseelandiae steindachneri*].
Richmond (1898). *Auk* **15**: 330 [*Tyrannus cubensis*].
Richmond (1899). *Auk* **16**: 186 [*Pachyramphus albogriseus salvini*].
Richmond (1907). In: Blackwelder, *Publ. Carnegie Inst. Washington* **54(1)**: 493 [*Anthus hodgsoni*].
Ridgway (1879). *Proc. US Natl. Mus.* **1**: 483 [*Hymenops perspicillatus andinus*].
Ridgway (1882). *Proc. US Natl. Mus.* **5**: 394 [*Myiarchus nuttingi*].
Ridgway (1883). *Proc. US Natl. Mus.* **6**: 95 [*Hirundo rustica saturata*, *Anthus gustavi stejnegeri*].
Ridgway (1884). *Ibis*: 27 [*Carpodectes antoniae*].
Ridgway (1884). *Proc. Biol. Soc. Washington* **2**: 90 [*Myiarchus tyrannulus magister*], 91 [*Myiarchus tuberculifer olivascens*].
Ridgway (1884). *Proc. US Natl. Mus.* **7**: 180 [*Elaenia martinica cinerescens*].
Ridgway (1885). *Proc. Biol. Soc. Washington* **3**: 23 [*Myiarchus tuberculifer platyrhynchus*].
Ridgway (1885). *Descr. New Species Birds Cozumel*: 3 [*Attila spadiceus cozumelae*].
Ridgway (1886). *Auk* **3**: 333 [*Pyroderus scutatus masoni*].
Ridgway (1886). *Ibis*: 459 [*Empidonax flavescens salvini*].
Ridgway (1887). *Man. No. Am. Birds*: 325 [*Pachyramphus aglaiae insularis*], 332 [*Myiodynastes maculatus insolens*], 334 [*Myiarchus tyrannulus brachyurus*].
Ridgway (1887). *Proc. US Natl. Mus.* **10**: 1 [*Cotinga ridgwayi*], 430 [*Muscisaxicola rufivertex occipitalis*].
Ridgway (1888). *Proc. US Natl. Mus.* **10(1887)**: 520 [*Camptostoma obsoletum napaeum*].
Ridgway (1888). *Auk* **5**: 262 [*Tityra semifasciata griseiceps*].
Ridgway (1891). *Proc. US Natl. Mus.* **14**: 467 [*Pachyramphus aglaiae hypophaeus*], 479 [*Xenopsaris*].
Ridgway (1893). *Proc. US Natl. Mus.* **16**: 606 [*Deltarhynchus*].
Ridgway (1903). *Proc. Biol. Soc. Washington* **16**: 106 [*Alopochelidon*].
Ridgway (1905). *Proc. Biol. Soc. Washington* **18**: 207 [*Myiotriccus*, *Terenotriccus*, *Aphanotriccus*], 208 [*Atalotriccus*, *Cnemarchus*], 209 [*Tyrannopsis*].
Ridgway (1906). *Proc. Biol. Soc. Washington* **19**: 115 [*Atalotriccus pilaris venezuelensis*, *Todirostrum cinereum coloreum*, *Tolmomyias poliocephalus klagesi*], 116 [*Mionectes olivaceus venezuelensis*, *Megarynchus pitangua caniceps*, *Myiarchus panamensis actiosus*], 117 [*Pipra erythrocephala berlepschi*, *Dixiphia pipra anthracina*], 118 [*Schiffornis turdina olivacea*], 119 [*Tityra semifasciata costaricensis*, *Tityra semifasciata columbiana*], 120 [*Pachyramphus aglaiae yucatanensis*].
Ridgway (1908). *Proc. Biol. Soc. Washington* **21**: 191 [*Conopias albovittatus distinctus*].
Riley (1904). *Smiths. Misc. Coll.* **47**: 275 [*Myiarchus nugator*].
Riley (1935). *Proc. Biol. Soc. Washington* **48**: 147 [*Riparia paludicola tantilla*].
Ripley (1951). *Postilla* **9**: 6 [*Ammomanes deserti insularis*].
Ripley (1953). *Postilla* **17**: 2 [*Anthus similis travancoriensis*].
Ripley (1960). *Postilla* **43**: 1 [*Psalidoprocne albiceps suffusa*].
Robbins, Rosenberg & Sornoza (1994). *Auk* **111**: 2-7 [*Doliornis remseni*].

Roberts (1917). *Ann. Transvaal Mus.* **5**: 258 [*Calendulauda africanoides harei*].
Roberts (1922). *Ann. Transvaal Mus.* **8**: 223 [*Pseudhirundo*], 224 [*Ptyonoprogne fuligula pretoriae*], 258 [*Hemimacronyx*], 261 [*Spizocorys conirostris damarensis*].
Roberts (1924). *Ann. Transvaal Mus.* **10**: 86 [*Galerida magnirostris harei*].
Roberts (1926). *Ann. Transvaal Mus.* **11**: 223 [*Mirafra fasciolata deserti*].
Roberts (1928). *Ann. Transvaal Mus.* **12**: 316 [*Calendulauda sabota bradfieldi*].
Roberts (1931). *Ann. Transvaal Mus.* **14**: 243 [*Eremopterix verticalis damarensis*].
Roberts (1932). *Ann. Transvaal Mus.* **15**: 27 [*Calendulauda africanoides sarwensis*], 28 [*Calendulauda sabota sabotoides, Calendulauda africanoides makarikari, Chersomanes albofasciata alticola, Mirafra africana ghansiensis, Mirafra rufocinnamomea mababiensis*], 29 [*Anthus vaalensis chobiensis*].
Roberts (1936). *Ann. Transvaal Mus.* **18**: 258 [*Calendulauda albescens karruensis*], 260 [*Certhilauda subcoronata gilli*], 261 [*Certhilauda semitorquata transvaalensis*], 262 [*Calendulauda sabota herero*].
Roberts (1936). *Ostrich*: 111 [*Anthus cinnamomeus rufuloides*].
Roberts (1937). *Ostrich* **8**: 95 [*Calendulauda barlowi*].
Roberts (1938). *Ostrich* **9**: 117 [*Calendulauda africanoides vincenti*].
Roberts (1941). *Ostrich* **11**: 129 [*Certhilauda brevirostris*].
Roberts (1942). *Ostrich* **13**: 52 [*Spizocorys conirostris barlowi*].
Roselaar (1995). *Songbirds of Turkey*: 23-24 [*Eremophila alpestris kumerloevei*].
van Rossem (1930). *Trans. San Diego Nat. Hist. Soc.* **6**: 198 [*Myiozetetes similis primulus*].
van Rossem (1934). *Trans. San Diego Nat. Hist. Soc.* **7**: 353 [*Pyrocephalus rubinus flammeus*].
van Rossem (1936). *Trans. San Diego Nat. Hist. Soc.* **8**: 116 [*Myiarchus nuttingi flavidior*].
van Rossem (1938). *Condor* **40**: 262 [*Pachyramphus aglaiae gravis*].
van Rossem (1940). *Trans. San Diego Nat. Hist. Soc.* **9**: 82 [*Pitangus sulphuratus texanus*].
van Rossem & Hachisuka (1937). *Proc. Biol. Soc. Washington* **50**: 197 [*Tityra semifasciata hannumi*].
Rothschild (1920). *Bull. Brit. Orn. Club* **41**: 33 [*Anthus similis asbenaicus*].
Rothschild (1931). *Bull. Brit. Orn. Club* **51**: 100 [*Spizocorys personata intensa*].
Rüppell (1836). *Neue Wirbelth. Vög.*: 105 [*Psalidoprocne pristoptera*].
Rüppell (1840). *Neue Wirbelth. Vög.*: 102 [*Macronyx flavicollis*], 103 [*Anthus cinnamomeus*].
Rüppell (1845). *Syst. Uebers. Vög. N.-o. Afr.*: 17 [*Cecropis daurica melanocrissus*].
Salvadori (1864). *Atti Soc. Ital. Sci. Nat. Milano* **7**: 152 [*Myiophobus fasciatus rufescens*].
Salvadori (1865). *Atti Soc. Ital. Sci. Nat. Milano* **8**: 378 [*Mirafra rufocinnamomea rufocinnamomea*].
Salvadori (1868). *Atti R. Accad. Sci. Torino* **3**: 292 [*Alaemon alaudipes doriae*].
Salvadori (1884). *Ann. Mus. Civ. Genova* **21**: 123 [*Psalidoprocne pristoptera antinorii*].
Salvadori (1897). *Boll. Mus. Zool. Anat. Comp. Univ. Torino* **12(292)**: 12 [*Poecilotriccus plumbeiceps viridiceps*], 13 [*Inezia inornata*].
Salvadori (1902). *Boll. Mus. Zool. Anat. Comp. Univ. Torino* **17(425)**: 2 [*Ammomanes deserti assabensis*].
Salvadori (1907). *Boll. Mus. Zool. Anat. Comp. Univ. Torino* **22(570)**: 6 [*Macronyx fuellebornii ascensi*].
Salvadori & Festa (1898). *Boll. Mus. Zool. Anat. Comp. Univ. Torino* **13(330)**: 1 [*Pachyramphus xanthogenys*].
Salvadori & Festa (1899). *Boll. Mus. Zool. Anat. Comp. Univ. Torino* **15(362)**: 12 [*Pseudotriccus pelzelni annectens*].
Salvadori & Giglioli (1885). *Atti R. Accad. Sci. Torino* **20**: 427-429 [*Mirafra erythrocephala*].
Salvin (1863). *Proc. Zool. Soc. London* **1863**: 190 [*Sublegatus arenarum*].
Salvin (1865). *Proc. Zool. Soc. London* **1864**: 583 [*Piprites griseiceps, Carpodectes, Carpodectes nitidus, Aphanotriccus capitalis*].
Salvin (1870). *Proc. Zool. Soc. London* **1870**: 198 [*Empidonax atriceps*], 200 [*Manacus aurantiacus*].
Salvin (1885). *Ibis*: 305 [*Iodopleura pipra leucopygia*].
Salvin (1897). *Bull. Brit. Orn. Club* **7**: 15 [*Todirostrum pictum*], 16 [*Inezia caudata*].
Salvin & Godman (1880). *Ibis*: 123 [*Ochthoeca rufipectoralis poliogastra*].
Salvin & Godman (1882). *Ibis*: 78 [*Platyrinchus saturatus*], 79 [*Lepidothrix suavissima*].
Salvin & Godman (1883). *Ibis*: 206 [*Oxyrhyncus cristatus hypoglaucus, Zimmerius gracilipes acer*], 207 [*Myiophobus roraimae, Myiarchus swainsoni phaeonotus*], 208 [*Pachyramphus viridis griseigularis*].
Salvin & Godman (1884). *Ibis*: 445 [*Poecilotriccus russatus*], 446 [*Elaenia pallatangae olivina, Phylloscartes nigrifrons*], 447 [*Chloropipo uniformis*], 448 [*Lipaugus streptophorus*], 449 [*Pipreola whitelyi*].
Salvin & Godman (1888). *Biol. Centr.-Amer., Aves* **2**: 26 [*Myiopagis*].
Salvin & Godman (1889). *Biol. Centr.-Amer., Aves* **2**: 58 [*Terenotriccus erythrurus fulvigularis*], 88 [*Myiarchus nuttingi inquietus*].
Salvin & Godman (1890). *Biol. Centr.-Amer., Aves* **2**: 120 [*Tityra inquisitor buckleyi, Tityra inquisitor pelzelni*].
Salvin & Godman (1891). *Biol. Centr.-Amer., Aves* **2**: 134 [*Attila spadiceus gaumeri*].
Savi (1831). *Nuovo Giorn. Letterat.* **57**: 190 [*Motacilla flava cinereocapilla*].
Say (1823). In: Long, *Exped. Rocky Mts.*: **2**: 60 [*Tyrannus verticalis*].
Schinz (1851). *Naturg. Ab. Vögel, 2nd ed.* **livr. 7**: 91 [*Lepidothrix iris*].
Schlegel (1844). *Krit. Ueber. Europ. Vögel*: 42 [*Cecropis striolata*].
Schodde & Mason (1999). *The Directory of Australian Birds*: 65-66 [*Atrichornis rufescens ferrieri*], 667 [*Hirundo tahitica albescens*], 715 [*Mirafra javanica athertonensis*].
Schou (1908). *Orn. Monatsber.* **16**: 119 [*Macronyx capensis colletti*].
Schulenberg & Graham (1981). *Bull. Brit. Orn. Club* **101**: 242 [*Anairetes agraphia plengei*].
Schulenberg & Parker (1997). *Orn. Monogr.* **48**: 723-724 [*Tolmomyias traylori*].
Schulz (1882). *J. Orn.* **30**: 462 [*Knipolegus signatus cabanisi*].
Sclater, P.L. (1851). *Contr. Orn.*: 143 [*Pipra aureola flavicollis*].
Sclater, P.L. (1852). *Rev. et Mag. Zool.* **Ser. 2, no. 4**: 9 [*Lepidothrix isidorei, Machaeropterus pyrocephalus, Chloropipo flavicapilla*].
Sclater, P.L. (1853). *Proc. Zool. Soc. London* **1851**: 193 [*Myiotheretes striaticollis, Cnemarchus erythropygius*].
Sclater, P.L. (1855). *Proc. Zool. Soc. London* **1854**: 66 [*Todirostrum nigriceps*], 109 [*Anthus bogotensis*], 110 [*Eremophila alpestris peregrina*], 113 [*Myiotriccus ornatus phoenicurus*].
Sclater, P.L. (1856). *Ann. and Mag. Nat. Hist.* **Ser. 2, no. 17**: 469 [*Pipreola riefferii melanolaema, Chiroxiphia pareola regina*].
Sclater, P.L. (1856). *Proc. Zool. Soc. London* **1856**: 28 [*Anairetes agilis, Ochthoeca fumicolor*], 29 [*Dixiphia pipra coracina*].
Sclater, P.L. (1857). *Proc. Zool. Soc. London* **1856**: 295 [*Oncostoma cinereigulare, Onychorynchus coronatus mexicanus*], 296 [*Myiobius sulphureipygius*], 297 [*Legatus leucophaius variegatus*], 299 [*Pipra mentalis*]; **1857**: 76 [*Pachyramphus cinnamomeus nigriventris*], 78 [*Pachyramphus albogriseus*], 82 [*Poecilotriccus calopterus*], 83 [*Poecilotriccus capitalis*], 203 [*Camptostoma, Camptostoma imberbe*].
Sclater, P.L. (1858). *Proc. Zool. Soc. London* **1857**: 276 [*Laniocera rufescens*]; **1858**: 70 [*Rhynchocyclus olivaceus aequinoctialis*], 71 [*Platyrinchus coronatus, Myiozetetes luteiventris*], 301 [*Empidonax affinis bairdi*].
Sclater, P.L. (1859). *Ibis*: 114 [*Cephalopterus penduliger*], 441 [*Contopus cinereus brachyturus*], 443 [*Tolmomyias sulphurescens cinereiceps*], 444 [*Poecilotriccus sylvia schistaceiceps*].
Sclater, P.L. (1859). *Proc. Zool. Soc. London* **1858**: 446 [*Pipreola frontalis*], 458 [*Zimmerius chrysops*], 553 [*Agriornis montanus solitarius*], 554 [*Elaenia albiceps griseigularis, Mecocerculus stictopterus*]; **1859**: 40 [*Attila citriniventris*], 42 [*Myiodynastes luteiventris, Myiodynastes maculatus nobilis*], 43 [*Contopus sordidulus*], 44 [*Mitrephanes phaeocercus*], 45 [*Pyrocephalus rubinus mexicanus*], 45-46 [*Myiozetetes*], 46 [*Myiopagis viridicata placens, Mionectes oleagineus assimilis, Legatus*], 142 [*Mecocerculus calopterus, Pachyramphus homochrous*].
Sclater, P.L. (1860). *Ibis*: 36 [*Elaenia flavogaster subpagana*].
Sclater, P.L. (1860). *Proc. Zool. Soc. London* **1859**: 280 [*Fluvicola nengeta atripennis*], 281 [*Tyrannus niveigularis*], 364 [*Stelgidopteryx serripennis fulvipennis*], 385 [*Lipaugus unirufus*]; **1860**: 68 [*Platyrinchus mystaceus albogularis, Myiarchus tuberculifer nigriceps*], 69 [*Phyllomyias cinereiceps, Zimmerius chrysops flavidifrons*], 78 [*Agriornis andicola*], 89 [*Pipreola jucunda*], 90 [*Machaeropterus deliciosus*], 91 [*Masius chrysopterus coronulatus*], 92 [*Rhynchocyclus fulvipectus*], 93 [*Myiobius villosus villosus*], 279 [*Pachyramphus spodiurus*], 280 [*Attila torridus*], 281 [*Megarynchus pitangua chrysogaster, Myiarchus phaeocephalus*], 282 [*Onychorynchus coronatus occidentalis, Cnipodectes subbrunneus*], 314 [*Elaenia martinica riisii*].
Sclater, P.L. (1861). *Proc. Zool. Soc. London* **1860**: 381 [*Colonia colonus fuscicapillus*], 406 [*Elaenia flavogaster semipagana*], 464 [*Myiophobus flavicans, Myiophobus pulcher, Myiophobus fasciatus crypterythrus*], 465 [*Myiophobus cryptoxanthus*], 466 [*Schiffornis turdina amazona*], 467 [*Neopelma*]; **1861**: 76 [*Elaenia fallax*], 210 [*Snowornis subalaris*].
Sclater, P.L. (1862). *Cat. Coll. Am. Birds*: 16 [*Neochelidon*], 208 [*Oncostoma*], 242 [*Pachyramphus cinnamomeus cinereiventris*], 243 [*Pachyramphus cinnamomeus dorsalis*], 245 [*Heterocercus*].
Sclater, P.L. (1862). *Proc. Zool. Soc. London* **1861**: 382 [*Platyrinchus flavigularis, Phyllomyias griseocapilla*], 407 [*Myiopagis subplacens, Elaenia pallatangae*], 408 [*Myiopagis viridicata implacens*]; **1862**: 111 [*Pogonotriccus poecilotis, Myiophobus pulcher bellus*], 112 [*Knipolegus poecilurus*], 113 [*Mecocerculus, Ochthoeca diadema gratiosa*].
Sclater, P.L. (1863). *Proc. Zool. Soc. London* **1863**: 63 [*Corapipo leucorrhoa*].
Sclater, P.L. (1864). *Ibis*: 169 [*Tyrannus caudifasciatus taylori*].
Sclater, P.L. (1864). *Proc. Zool. Soc. London* **1864**: 108 [*Psalidoprocne albiceps*].
Sclater, P.L. (1865). *Proc. Zool. Soc. London* **1864**: 611 [*Lepidothrix nattereri*].
Sclater, P.L. (1871). *Proc. Zool. Soc. London* **1870**: 831 [*Elaenia gigas*], 833 [*Elaenia frantzii pudica*]; **1871**: 497 [*Euscarthmus meloryphus fulviceps*].
Sclater, P.L. (1872). *Proc. Zool. Soc. London* **1872**: 541 [*Knipolegus hudsoni*].
Sclater, P.L. (1874). *Proc. Zool. Soc. London* **1873**: 781 [*Poecilotriccus pulchellus*], 782 [*Myiotriccus ornatus aureiventris*].
Sclater, P.L. (1878). *Ibis*: 366 [*Anthus nattereri*].
Sclater, P.L. (1884). *Proc. Zool. Soc. London* **1883**: 654 [*Cnipodectes subbrunneus minor*].
Sclater, P.L. (1887). *Proc. Zool. Soc. London* **1887**: 47 [*Phylloscartes oustaleti*], 48 [*Phylloscartes gualaquizae*], 49 [*Myiopagis flavivertex*].
Sclater, P.L. (1888). *Cat. Birds Brit. Mus.* **14**: 31 [*Ochthornis*], 216, 218 [*Knipolegus poecilurus salvini*], 287 [*Chloropipo holochlora*].
Sclater, P.L. & Salvin (1859). *Ibis*: 119 [*Sayornis nigricans aquatica*], 122 [*Zimmerius vilissimus, Empidonax albigularis*].
Sclater, P.L. & Salvin (1860). *Proc. Zool. Soc. London* **1860**: 299 [*Platyrinchus cancrominus*], 300 [*Schiffornis turdina veraepacis, Ornithion semiflavum, Rhytipterna holerythra*].
Sclater, P.L. & Salvin (1865). *Proc. Zool. Soc. London* **1865**: 358 [*Camptostoma obsoletum flaviventre*].
Sclater, P.L. & Salvin (1866). *Proc. Zool. Soc. London* **1866**: 187 [*Muscisaxicola fluviatilis*], 188 [*Serpophaga hypoleuca, Stigmatura*].
Sclater, P.L. & Salvin (1867). *Proc. Zool. Soc. London* **1866**: 579 [*Schiffornis turdina wallacii*].
Sclater, P.L. & Salvin (1868). *Proc. Zool. Soc. London* **1867**: 757 [*Leptopogon amaurocephalus peruvianus*], 981 [*Zimmerius gracilipes*]; **1868**: 171 [*Sublegatus, Sublegatus arenarum glaber, Hemitriccus margaritaceiventer impiger*], 326 [*Oxyrhyncus cristatus frater*], 389 [*Phylloscartes superciliaris*], .
Sclater, P.L. & Salvin (1869). *Proc. Zool. Soc. London* **1868**: 419 [*Contopus ochraceus*], 628, 632 [*Schiffornis turdina stenorhyncha*]; **1869**: 154 [*Lessonia oreas*], 438 [*Neopipo*].
Sclater, P.L. & Salvin (1870). *Proc. Zool. Soc. London* **1869**: 599 [*Ochthoeca oenanthoides polionota*].
Sclater, P.L. & Salvin (1871). *Proc. Zool. Soc. London* **1870**: 786 [*Ochthoeca fumicolor superciliosa*], 787 [*Ochthoeca cinnamomeiventris nigrita*], 841 [*Zimmerius improbus, Phyllomyias burmeisteri leucogenys, Phyllomyias griseiceps*].
Sclater, P.L. & Salvin (1873). *Nomencl. Avium. Neotrop.*: 57, 159 [*Casiornis fuscus*], 158 [*Mecocerculus poecilocercus, Inezia subflava, Hemitriccus margaritaceiventer wuchereri*], 159 [*Rhytipterna immunda*].
Sclater, P.L. & Salvin (1873). *Proc. Zool. Soc. London* **1873**: 187 [*Pseudocolopteryx acutipennis*], 280 [*Tolmomyias flaviventris viridiceps*], 281 [*Cnipodectes*].
Sclater, P.L. & Salvin (1876). *Proc. Zool. Soc. London* **1876**: 354 [*Myiotheretes fuscorufus*], 355 [*Lipaugus uropygialis, Anairetes flavirostris, Ochthoeca pulchella*].
Sclater, P.L. & Salvin (1877). *Proc. Zool. Soc. London* **1877**: 19 [*Ochthoeca leucophrys leucometopa*], 522 [*Snowornis cryptolophus, Poecilotriccus ruficeps rufigenis*].
Sclater, P.L. & Salvin (1878). *Proc. Zool. Soc. London* **1878**: 138 [*Myiarchus semirufus*].
Sclater, P.L. & Salvin (1880). *Proc. Zool. Soc. London* **1880**: 156 [*Platyrinchus platyrhynchos senex, Sirystes sibilator albocinereus*], 157 [*Heterocercus aurantiivertex, Contopus nigrescens*], 158 [*Laniisoma elegans buckleyi*].
Sclater, P.L. & Salvin (1881). *Ibis*: 267 [*Todirostrum maculatum signatum*], 268 [*Tyranneutes*], 269 [*Myiarchus apicalis*].
Sclater, W.L. (1926). *Bull. Brit. Orn. Club* **47**: 28 [*Eremalauda*], 29 [*Calendulauda sabota ansorgei*].
Sclater, W.L. & Mackworth-Praed (1918). *Ibis*: 718-719 [*Cecropis abyssinica unitatis*].
Scopoli (1769). *Annus I. Hist.-Nat.*: 167 [*Ptyonoprogne rupestris*].
Scopoli (1786). *Deliciae Florae Faunae Insubricae* **2**: 94 [*Galerida malabarica*], 95 [*Eremopterix griseus*], 96 [*Hirundo rustica gutturalis*].
Selby (1826). *Zool. J.* **2(8)**: 483 [*Tityra inquisitor erythrogenys*].
Serle (1959). *Bull. Brit. Orn. Club* **79**: 2 [*Mirafra africana bamendae*].
Severtsov (1873). *Izvest. Imp. Obsch. Liubit. Estestv. Antrop. Etnogr. Moskva* **8(2)**: 142 [*Calandrella rufescens leucophaea, Alauda gulgula inconspicua*].
Sharpe (1882). *J. Linn. Soc. London, Zool.* **16(92)**: 322 [*Riparia paludicola cowani*].
Sharpe (1884). In: Layard, *Birds of South Africa*: 536 [*Anthus similis nicholsoni*].
Sharpe (1885). *Cat. Birds Brit. Mus.* **10**: 96, 100 [*Riparia riparia shelleyi*], 190, 192 [*Petrochelidon nigricans timoriensis*], 492 [*Motacilla grandis*], 550 [*Anthus nilghiriensis*], 560 [*Anthus pallidiventris*].
Sharpe (1888). *Proc. Zool. Soc. London* **1888**: 107 [*Elaenia ridleyana*].
Sharpe (1890). *Cat. Birds Brit. Mus.* **13**: 512, 525 [*Chersophilus*], 590 [*Calandrella rufescens persica, Calandrella rufescens seebohmi*], 595, 603 [*Mirafra javanica secunda*], 596, 617 [*Calendulauda alopex*], 645 [*Ammomanes deserti algeriensis*].
Sharpe (1891). *Ibis*: 444 [*Macronyx ameliae wintoni*].
Sharpe (1895). *Bull. Brit. Orn. Club* **4**: xxix [*Mirafra gilletti*].
Sharpe (1895). *Proc. Zool. Soc. London* **1895**: 471 [*Spizocorys personata*], 472 [*Calandrella somalica*].
Sharpe (1896). *Bull. Brit. Orn. Club* **5**: xxiv [*Mirafra collaris*].
Sharpe (1900). *Bull. Brit. Orn. Club* **10**: ci [*Calandrella somalica athensis*], cii [*Pseudalaemon fremantlii delamerei*].
Sharpe (1902). *Bull. Brit. Orn. Club* **12**: 62 [*Mirafra africana grisescens, Mirafra africana pallida*].
Sharpe (1904). *Ibis* **8(4)**: 361 [*Certhilauda subcoronata damarensis, Certhilauda subcoronata bradshawi, Certhilauda benguelensis*].
Sharpe (1908). *Ibis*: 341 [*Motacilla clara*].
Sharpe & Bouvier (1876). *Bull. Soc. Zool. France* **1**: 38 [*Psalidoprocne pristoptera petiti*].
Sharpe & Wyatt (1887). *Monogr. Hirundinidae.*: 119 [*Ptyonoprogne fuligula anderssoni*].
Sharpe & Wyatt (1893). *Monogr. Hirundinidae*: 41, 63 [*Riparia diluta*].
Shaw (1792). *Mus. Leverianum* **2**: 61 [*Haematoderus militaris*]; **4**: 199 [*Pyroderus scutatus*].
Shaw (1793). *Nat. Misc.* **5**: pl. 153 [*Chiroxiphia caudata*].
Shaw (1809). *Nat. Misc.* **20**: pl. 849 [*Ilicura militaris*].
Shelley (1873). *Ibis*: 142 [*Mirafra rufocinnamomea buckleyi*].
Shelley (1882). *Proc. Zool. Soc. London* **1882**: 308 [*Mirafra rufocinnamomea torrida*].
Shelley (1887). *Proc. Zool. Soc. London* **1887**: 123 [*Psalidoprocne fuliginosa*].
Shelley (1900). *Birds Afr.* **2**: 305 [*Anthus melindae*]. 311 [*Anthus vaalensis*]. 321 [*Anthus cinnamomeus camaroonensis*].
Shelley (1902). *Birds Africa* **3**: 15, 71 [*Pinarocorys*], 99 [*Ammomanes deserti samharensis*], 128 [*Calandrella blanfordi*], 135 [*Spizocorys starki*], 136 [*Spizocorys sclateri*].
Shelley (1904). *Bull. Brit. Orn. Club* **14**: 82 [*Eremalauda dunni*].
Shirihai & Colston (1992). *Bull. Brit. Orn. Club* **112(2)**: 130 [*Riparia riparia eilata*].
Short (1969). *Auk* **86**: 269 [*Platyrinchus mystaceus partridgei*].
Shulpin (1928). *Ann. Mus. Zool. Acad. Sci. URSS* **28**: 402 [*Anthus gustavi menzbieri*].
Sick (1959). *J. Orn.* **100**: 111 [*Lepidothrix vilasboasi*].
Smith, A. (1836). *Rep. Exped. Central Africa*: 46 [*Certhilauda chuana*], 47 [*Mirafra africana, Calendulauda sabota, Calendulauda africanoides, Certhilauda semitorquata*], 48 [*Eremopterix verticalis*], 49 [*Eremopterix australis*].
Smith, A. (1843). *Illus. Zool. South Africa, Aves*: pl. 87 [*Calendulauda albescens codea*], pl. 89 [*Mirafra cheniana*], pl. 90 [*Certhilauda subcoronata*].
Smith, A. (1846). *Illus. Zool South Africa, Aves*: pl. 106 [*Chersomanes albofasciata garrula*].
Smithers (1955). *Bull. Brit. Orn. Club* **75**: 29 [*Mirafra fasciolata nata*].
Snethlage, E. (1907). *Orn. Monatsber.* **15**: 160 [*Pipra fasciicauda purusiana*], 193 [*Hemitriccus minor, Hemitriccus iohannis*], 194 [*Serpophaga hypoleuca pallida, Hemitriccus griseipectus*], 195 [*Terenotriccus erythrurus hellmayri*].
Snethlage, E. (1914). *Orn. Monatsber.* **22**: 42 [*Conopias trivirgatus berlepschi*].
Snethlage, E. (1925). *J. Orn.* **73**: 266 [*Hemitriccus mirandae*].
Snethlage, E. (1928). *Boll. Mus. Nac. Rio J.* **4(2)**: 1 [*Knipolegus aterrimus franciscanus*], 2 [*Phylloscartes roquettei*].
Snethlage, E.H. (1937). *Orn. Monatsber.* **45**: 174 [*Hemitriccus minor snethlageae*].
Snow (1980). *Bull. Brit. Orn. Club* **100**: 213-215 [*Tijuca condita*].
van Someren (1919). *Bull. Brit. Orn. Club* **40**: 56 [*Anthus caffer blayneyi*].
van Someren (1921). *Bull. Brit. Orn. Club* **41**: 124 [*Anthus sokokensis*], 125 [*Mirafra rufocinnamomea kawirondensis*].
van Someren (1922). *Nov. Zool.* **29**: 90 [*Riparia cincta suahelica*].
Sparrman (1787). *Mus. Carlsonianum* **2**: 33 [*Acanthisitta chloris*].
Sparrman (1789). *Mus. Carlsonianum* **4**: pl. 100 [*Hirundo tahitica javanica*].

Spix (1825). *Av. Sp. Nov. Brasil* **2**: 5 [*Pipra cornuta*, *Lepidothrix coronata*], 6 [*Pipra filicauda*], 9 [*Ramphotrigon ruficauda*], 10 [*Tolmomyias sulphurescens*], 11 [*Contopus cinereus*], 13 [*Phyllomyias fasciatus brevirostris*], 14 [*Phaeomyias murina*], 16 [*Tyrannopsis sulphurea*], 18 [*Myiozetetes similis*], 20 [*Xolmis irupero niveus*], 21 [*Fluvicola albiventer*], 22 [*Empidonomus varius rufinus*], 32 [*Tityra semifasciata*].
Stanley (1814). In: Salt, *Voy. in Abyssinia*: 60 [*Alaemon alaudipes desertorum*, *Eremopterix leucotis*].
Statius Muller (1776). *Natursyst.* (Suppl.): 85 [*Perissocephalus tricolor*], 137 [*Galerida cristata senegallensis*], 147 [*Cotinga maculata*], 168 [*Onychorynchus coronatus*], 169 [*Querula purpurata*, *Myiodynastes maculatus*, *Myiarchus tyrannulus*], 172 [*Myiophobus fasciatus*].
Stead (1936). *Trans. Proc. Roy. Soc. New Zealand* **66**: 313 [*Xenicus longipes variabilis*].
Stegmann (1925). *Compt. Rend. Acad. Sci. Russie*: 39 [*Riparia diluta tibetana*].
Stegmann (1932). *Orn. Monatsber.* **40**: 54 [*Calandrella rufescens pseudobaetica*].
Stejneger (1885). In: Kingsley, *Standard Nat. Hist.* **4**: 462 [*Atrichornis*].
Stejneger (1887). *Proc. US Natl. Mus.* **9**: 646 [*Hirundo tahitica namivei*].
Stephens (1817). In: Shaw, *Gen. Zool.* **10(1)**: 90 [*Hirundo rustica savignii*].
Stephens (1826). In: Shaw, *Gen. Zool.* **13(2)**: 78 [*Hirundo smithii filifera*]; **14(1)**: 26 [*Galerida magnirostris*].
Stiles (1995). *Lozania* **66**: 1-16 [*Hemitriccus margaritaceiventer chiribiquetensis*].
Stresemann (1912). *Nov. Zool.* **19**: 316 [*Anthus rufulus albidus*].
Stresemann (1920). *Avif. Macedon.*: 76 [*Motacilla flava macronyx*].
Stresemann (1938). *Orn. Monatsber.* **46**: 151 [*Anthus hoeschi*].
Strickland (1844). *Ann. and Mag. Nat. Hist.* **13**: 414 [*Satrapa*].
Strickland (1849). In: Jardine, *Contr. Orn.*: pl. 15 [*Hirundo albigularis*].
Strickland (1850). In: Jardine, *Contr. Orn.*: 48 [*Todirostrum chrysocrotaphum*], 121 [*Heterocercus linteatus*].
Strickland (1852). *Proc. Zool. Soc. London* **1850**: 218 [*Mirafra cordofanica*], 219 [*Pinarocorys erythropygia*].
Strickland (1853). In: Jardine, *Contr. Orn.*: 151 [*Calendulauda erythrochlamys*], 152 [*Calandrella cinerea spleniata*, *Calendulauda sabota naevia*].
Stuart Baker (1915). *Bull. Brit. Orn. Club* **36**: 9 [*Mirafra javanica williamsoni*].
Stuart Baker (1933). *Bull. Brit. Orn. Club* **54**: 24 [*Ptyonoprogne concolor sintaungensis*].
Such (1825). *Zool. J.* **2**: 114 [Gubernetes].
Sundevall (1836). *Vetensk.-Acad. Handl.* **1835**: 89 [*Elaenia*], 93 [*Corythopis*].
Sundevall (1850). *Oefv. Kongl. Vet.-Akad. Forh.* **7**: 99 [*Spizocorys conirostris*, *Spizocorys fringillaris*, *Mirafra fasciolata*, *Pinarocorys nigricans*], 100 [*Anthus lineiventris*, *Anthus brachyurus*, *Anthus caffer*], 107 [*Pseudhirundo griseopyga*, *Hirundo dimidiata*, *Hirundo atrocaerulea*, *Cecropis semirufa*], 108 [*Psalidoprocne pristoptera holomelas*, *Petrochelidon spilodera*], 127 [*Eremopterix nigriceps albifrons*], 128 [*Ammomanes cinctura arenicolor*, *Motacilla aguimp vidua*].
Sundevall (1872). *Methodi Naturalis Avium Disponendarum Tentamen*: 54 [*Spizocorys*], 59 [*Colorhamphus*].
Sushkin (1925). *Proc. Boston Soc. Nat. Hist.* **38**: 33 [*Motacilla flava angarensis*].
Swainson (1821). *Zool. Illustr.* **1**: pl. 37 [*Carpornis cucullata*], pl. 49 [*Oxyrhyncus cristatus*].
Swainson (1826). *Quart. J. Sci. Lit. Arts* **20(40)**: 273 [*Tyrannus vociferans*, *Tyrannus crassirostris*].
Swainson (1826). *Zool. J.* **3**: 165 [*Pitangus*].
Swainson (1827). *Philos. Mag. (New Ser.)* **1**: 366 [*Petrochelidon pyrrhonota melanogaster*, *Tachycineta thalassina*], 367 [*Empidonax affinis*, *Sayornis nigricans*, *Myiarchus barbirostris*].
Swainson (1827). *Zool. J.* **3**: 172 [*Fluvicola*], 344 [*Certhilauda*, *Macronyx*], 359 [*Culicivora*].
Swainson (1832). In: Swainson & Richardson, *Fauna Bor.-Amer.* **2**: 490 [*Lessonia*], 491 [*Calyptura*, *Phoenicircus*, *Phoenicircus nigricollis*], 492 [*Laniisoma*].
Swainson (1835). *Ornith. Drawings* **4**: pl. 47 [*Ramphotrigon megacephalum*], pl. 49 [*Myiopagis caniceps*].
Swainson (1837). *Birds W. Afr.* **2**: 74 [*Hirundo leucosoma*].
Swainson (1837). *Anim. in Menag.*: 286 [*Tityra cayana braziliensis*].
Swainson (1838). *Anim. in Menag.*: 289 [*Pachyramphus cinnamomeus spixii*], 316 [*Anthus novaeseelandiae bistriatus*], 357 [*Pipreola*, *Pipreola chlorolepidota*].
Swinhoe (1859). *Zoologist* **17**: 6724 [*Alauda gulgula coelivox*].
Swinhoe (1860). *Ibis*: 55 [*Motacilla alba oculari*s].
Swinhoe (1861). *Ibis*: 256 [*Galerida cristata leautungensis*].
Swinhoe (1863). *Proc. Zool. Soc. London* **1863**: 89 [*Alauda arvensis intermedia*, *Alauda arvensis pekinensis*], 90 [*Anthus gustavi*, *Anthus spinoletta blakistoni*], 274, 334 [*Motacilla flava taivana*].
Swinhoe (1871). *Ann. and Mag. Nat. Hist.* **Ser. 4, no. 7**: 257 [*Mirafra javanica parva*].
Swinhoe (1871). *Proc. Zool. Soc. London* **1871**: 363 [*Motacilla alba baicalensis*], 389 [*Alauda gulgula wattersi*], 390 [*Calandrella rufescens cheleensis*].
Sykes (1832). *Proc. Comm. Zool. Soc. London* **1832**: 83 [*Ptyonoprogne concolor*, *Cecropis daurica erythropygia*], 90 [*Motacilla flava beema*], 91 [*Motacilla alba dukhunensis*], 92 [*Galerida deva*], 93 [*Calandrella brachydactyla dukhunensis*].
Taczanowski (1874). *Proc. Zool. Soc. London* **1874**: 133 [*Ochthoeca cinnamomeiventris thoracica*], 134 [*Polioxolmis rufipennis*], 135 [*Pogonotriccus ophthalmicus*], 136 [*Doliornis*, *Doliornis sclateri*].
Taczanowski (1875). *Proc. Zool. Soc. London* **1874**: 507 [*Anthus furcatus brevirostris*, *Anthus correndera calcaratus*], 532 [*Knipolegus signatus*], 537 [*Tolmomyias sulphurescens peruvianus*], 538 [*Myiophobus flavicans superciliosus*].
Taczanowski (1876). *Bull. Soc. Zool. France* **1**: 158 [*Anthus godlewskii*].
Taczanowski (1877). *Proc. Zool. Soc. London* **1877**: 324 [*Tumbezia salvini*], 325 [*Phaeomyias murina tumbezana*, *Pseudelaenia leucospodia*].
Taczanowski (1879). *Proc. Zool. Soc. London* **1879**: 233 [*Mecocerculus minor*], 236 [*Pipreola lubomirskii*].
Taczanowski (1880). *Proc. Zool. Soc. London* **1879**: 671 [*Myiarchus cephalotes*].
Taczanowski (1883). *Proc. Zool. Soc. London* **1883**: 71 [*Phytotoma raimondii*, *Ochthoeca jelskii*].
Taczanowski (1884). *Orn. Pérou* **2**: 213 [*Muscisaxicola griseus*], 214 [*Muscisaxicola juninensis*], 231 [*Lophotriccus pileatus luteiventris*], 253 [*Phaeomyias murina wagae*], 285 [*Tolmomyias poliocephalus*], 335 [*Chloropipo unicolor*], 376 [*Pipreola intermedia*], 555 [*Anairetes nigrocristatus*].
Taczanowski (1888). *Bull. Soc. Zool. France* **12**: 621 [*Galerida cristata caucasica*].
Taczanowski (1888). *Proc. Zool. Soc. London* **1887**: 603 [*Galerida cristata coreensis*].
Taczanowski (1889). *Warsz. Uniwers. Izv.* **4**: 19 [*Rupicola peruvianus aequatorialis*].
Taczanowski & Berlepsch (1885). *Proc. Zool. Soc. London* **1885**: 88 [*Pseudotriccus*, *Pseudotriccus pelzelni*], 91 [*Myiophobus phoenicomitra*, *Myiodynastes chrysocephalus minor*].
de Tarragon (1845). *Rev. Zool.*: 452 [*Macronyx ameliae*].
Teixeira (1987). *Bull. Brit. Orn. Club* **107(1)**: 38-39 [*Phylloscartes ceciliae*].
Temminck (1820). *Man. d'Orn.*: 80 [*Oxyruncus*].
Temminck (1820). *Planches Color* **livr. 2**: pl. 12 [*Rhynchocyclus olivaceus*, *Platyrinchus mystaceus cancromus*].
Temminck (1821). *Planches Color* **livr. 9**: pl. 54 [*Pipra rubrocapilla*].
Temminck (1822). *Planches Color* **livr. 24**: pl. 144 [*Pogonotriccus eximius*, *Myiophobus fasciatus flammiceps*, *Hemitriccus diops*]; **livr. 27**: pl. 161 [*Alopochelidon fucata*]; **livr. 28**: pl. 167 [*Serpophaga subcristata straminea*]; **livr. 29**: pl. 172 [*Piprites chloris*, *Piprites pileata*].
Temminck (1823). *Planches Color* **livr. 41**: pl. 244 [*Eremophila bilopha*, *Ammomanes deserti isabellina*].
Temminck (1824). *Planches Color* **livr. 46**: pl. 275 [*Phyllomyias virescens*, *Camptostoma obsoletum*, *Phylloscartes ventralis*].
Temminck (1835). *Man. d'Orn.* **3**: 298 [*Cecropis daurica rufula*].
Temminck & Schlegel (1845). In: Siebold, *Fauna Jap., Aves*: 33 [*Cecropis daurica japonica*], 34 [*Cecropis abyssinica puella*].
Temminck & Schlegel (1847). In: Siebold, *Fauna Jap., Aves*: 59 [*Anthus rubescens japonicus*].
Temminck & Schlegel (1848). In: Siebold, *Fauna Jap., Aves*: 87 [*Alauda arvensis japonica*].
Thayer & Bangs (1905). *Bull. Mus. Comp. Zool.* **46**: 152 [*Myiophobus fasciatus furfurosus*].
Thayer & Bangs (1914). *Proc. New Engl. Zoöl. Cl.* **5**: 41 [*Motacilla flava plexa*].
Thonglongya (1968). *Thai Natl. Sci. Papers, Faun. Ser.* **1**: 3 [*Pseudochelidon sirintarae*].
Thunberg (1822). *Mém. Acad. Imp. Sci. St. Pétersb.* **8**: 283, 285 [*Phyllomyias fasciatus*], 283, 286 [*Dixiphia pipra cephaleucos*, *Elaenia flavogaster*].
Thunberg (1823). *Diss. Tull. Nov. Spec. Amp.*: 2 [*Laniisoma elegans*].
Thunberg (1824). *Diss. Gen.* Megaryncho *Praes. Schaerstrom*: 2 [*Megarynchus*].
Ticehurst (1916). *Ibis* **10(4)**: 70 [*Riparia diluta indica*].
Ticehurst (1940). *Bull. Brit. Orn. Club* **60**: 81 [*Motacilla clara torrentium*].
Ticehurst & Cheesman (1924). *Bull. Brit. Orn. Club* **45**: 20 [*Ammomanes deserti azizi*].
Todd (1912). *Ann. Carnegie Mus.* **8**: 207 [*Myiobius atricaudus modestus*], 209 [*Myiodynastes chrysocephalus cinerascens*], 210 [*Machetornis rixosa flavigularis*], 211 [*Pipreola aureopectus festiva*].
Todd (1913). *Proc. Biol. Soc. Washington* **26**: 170 [*Poecilotriccus sylvia griseolus*], 171 [*Leptopogon amaurocephalus diversus*, *Tolmomyias flaviventris aurulentus*].
Todd (1915). *Proc. Biol. Soc. Washington* **28**: 169 [*Hemitriccus flammulatus olivascens*].
Todd (1917). *Proc. Biol. Soc. Washington* **30**: 4 [*Attila spadiceus caniceps*].
Todd (1919). *Proc. Biol. Soc. Washington* **32**: 114 [*Mecocerculus leucophrys notatus*, *Platyrinchus mystaceus neglectus*, *Myiobius barbatus semiflavus*], 115 [*Lepidothrix coronata minuscula*].
Todd (1920). *Proc. Biol. Soc. Washington* **33**: 72 [*Sublegatus obscurior*, *Sirystes sibilator subcanescens*].
Todd (1921). *Proc. Biol. Soc. Washington* **34**: 176, 187 [*Mionectes oleagineus pacificus*].
Todd (1922). *Proc. Biol. Soc. Washington* **35**: 32 [*Myiobius villosus peruvianus*].
Todd (1925). *Proc. Biol. Soc. Washington* **38**: 92 [*Lophotriccus vitiosus congener*], 93 [*Lophotriccus eulophotes*, *Hemitriccus striaticollis griseiceps*], 94 [*Hemitriccus minor pallens*, *Hemitriccus minimus*, *Taeniotriccus andrei klagesi*], 95 [*Phylloscartes virescens*, *Myiozetetes granadensis obscurior*], 96 [*Pipra aureola aurantiicollis*, *Myiobius barbatus amazonicus*], 98 [*Lepidothrix coronata carbonata*].
Todd (1928). *Proc. Biol. Soc. Washington* **41**: 111 [*Manacus manacus purissimus*], 112 [*Pipra filicauda subpallida*, *Lepidothrix iris eucephala*], 113 [*Schiffornis turdina steinbachi*].
Todd (1929). *Auk* **46**: 245 [*Haplochelidon*].
Todd (1935). *Proc. Biol. Soc. Washington* **48**: 63 [*Anthus rubescens pacificus*], 64 [*Anthus rubescens alticola*].
Todd (1950). *Proc. Biol. Soc. Washington* **63**: 6 [*Iodopleura isabellae paraensis*].
Todd (1952). *Ann. Carnegie Mus.* **32**: 291 [*Pitangus sulphuratus argentinus*], 296 [*Rhynchocyclus olivaceus sordidus*], 297 [*Rhynchocyclus olivaceus tamborensis*], 298 [*Hemitriccus granadensis andinus*, *Poecilotriccus latirostris austroriparius*], 299 [*Lophotriccus pileatus santaeluciae*], 301 [*Pogonotriccus ophthalmicus purus*], 302 [*Myiopagis viridicata restricta*, *Elaenia pallatangae exsul*].
Townsend, C.H. (1895). *Bull. Mus. Comp. Zool.* **27**: 124 [*Nesotriccus*, *Nesotriccus ridgwayi*].
Traylor (1962). *Fieldiana Zool.* **44(12)**: 113 [*Mirafra fasciolata jappi*], 114-115 [*Spizocorys conirostris makawai*].
Traylor (1977). *Bull. Mus. Comp. Zool.* **148**: 147 [*Zimmerius*].
Tristram (1859). *Ibis*: 57, 426 [*Galerida cristata macrorhyncha*], 58, 426 [*Galerida cristata arenicola*].
Tristram (1865). *Proc. Zool. Soc. London* **1864**: 434 [*Calandrella brachydactyla hermonensis*], 435 [*Galerida cristata brachyura*].
Tschudi (1844). *Archiv Naturgeschichte* **10(1)**: 270 [*Ampelion rufaxilla*], 271 [*Pipra chloromeros*, *Lepidothrix coeruleocapilla*], 272 [*Conopias cinchoneti*, *Myiodynastes chrysocephalus*], 273 [*Lophotriccus pileatus*, *Hemitriccus margaritaceiventer rufipes*], 274 [*Elaenia albiceps modesta*, *Zimmerius viridiflavus*], 275 [*Leptopogon superciliaris*], 276 [*Serpophaga cinerea*, *Muscisaxicola albifrons*], 279 [*Corythopis torquatus*].
Tschudi (1845). *Fauna Peruana*: 21 [*Ampelion*].
Tschudi (1846). *Unters. Faun. Peru., Aves*: 162 [*Leptopogon amaurocephalus*].
Tschusi (1900). *Orn. Jahrb.* **11**: 223 [*Motacilla cinerea schmitzi*].
Tschusi (1903). *Orn. Jahrb.* **14**: 162 [*Alauda arvensis scotica*].
Tunstall (1771). *Orn. Brit.*: 2 [*Anthus rubescens*, *Motacilla cinerea*].
Uchida & Kuroda (1916). *Annot. Zool. Jap.* **9**: 134 [*Anthus hodgsoni yunnanensis*].
Van Tyne (1938). *Occas. Pap. Mus. Zool. Univ. Michigan* **385**: 2 [*Petrochelidon fulva citata*].
Vaurie (1951). *Amer. Mus. Novit.* **1529**: 15 [*Ptyonoprogne fuligula perpallida*].
Vaurie (1953). *Amer. Mus. Novit.* **1640**: 1 [*Ptyonoprogne fuligula presaharica*].
Vaurie (1957). *Amer. Mus. Novit.* **1832**: 12 [*Motacilla cinerea patriciae*].
Vaurie & Dharmakumarsinhji (1954). *J. Bombay Nat. Hist. Soc.* **52**: 8 [*Calandrella raytal krishnakumarsinhji*].
Verreaux, J. (1866). *Bull. Nouv. Arch. Mus. Hist. Nat.* **2**: 22 [*Contopus latirostris*].
Verreaux, J. (1867). *Arch. Mus. Hist. Nat.* **3**: 5 [*Ampelioides*].
Verreaux, J. & Verreaux, E. (1851). *Rev. et Mag. Zool.* **Ser. 2, no. 3**: 310 [*Pseudhirundo griseopyga melbina*].
Verreaux, J. & Verreaux, E. (1853). *Rev. et Mag. Zool.* **Ser. 2, no. 5**: 193 [*Procnias tricarunculatus*].
Vieillot (1808). *Ois. Am.* **1**: 61 [*Tachycineta bicolor*], 62 [*Petrochelidon fulva*], 72 [*Tyrannus savana*].
Vieillot (1816). *Analyse*: 31 [*Phibalura*, *Tyrannulus*], 37 [*Querula*], 39 [*Alectrurus*, *Tityra*], 68 [*Phibalura flavirostris*, *Alectrurus tricolor*, *Xolmis cinereus*].
Vieillot (1816). *Nouv. Dict. Hist. Nat. (Nouv. éd.)* **1**: 342 [*Mirafra apiata*], 365 [*Macronyx croceus*]; **3**: 316 [*Casiornis rufus*], 348 [*Pachyramphus viridis*].
Vieillot (1817). *Nouv. Dict. Hist. Nat. (Nouv. éd.)* **8**: 162 [*Iodopleura fusca*], 164 [*Procnias nudicollis*, *Laniocera hypopyrra*]; **11**: 171 [*Myiopagis viridicata*], 204 [*Serpophaga nigricans*], 210 [*Polystictus pectoralis*], 229 [*Serpophaga subcristata*], 277 [*Tachuris rubrigastra*]; **14**: 509 [*Notiochelidon cyanoleuca*], 510 [*Progne tapera fusca*], 511 [*Riparia paludicola*], 519 [*Tachycineta leucorrhoa*, *Petrochelidon pyrrhonota*], 523 [*Stelgidopteryx ruficollis*, *Petrochelidon nigricans*].
Vieillot (1818). *Nouv. Dict. Hist. Nat. (Nouv. éd.)* **21**: 447 [*Knipolegus cyanirostris*], 448 [*Colonia colonus*], 453 [*Knipolegus nigerrimus*], 455 [*Culicivora caudacuta*], 457 [*Sirystes sibilator*], 458 [*Empidonomus varius*, *Satrapa icterophrys*], 460 [*Gubernetes yetapa*], 487 [*Suiriri suiriri*]; **24**: 528 [*Calyptura cristata*]; **26**: 64 [*Phytotoma rutila*], 491 [*Anthus richardi*, *Anthus correndera*], 494 [*Anthus rufulus*], 501 [*Anthus novaeseelandiae australis*], 502 [*Anthus leucophrys*]; **27**: 10 [*Pachyramphus cinnamomeus polychopterus*], 11 [*Legatus leucophaius*], 14 [*Platyrinchus mystaceus*], 16 [*Myiornis auricularis*], 22 [*Empidonax virescens*].
Vieillot (1819). *Nouv. Dict. Hist. Nat. (Nouv. éd.)* **35**: 74 [*Hirundinea ferruginea bellicosa*], 84 [*Tyrannus melancholicus*], 85 [*Machetornis rixosa*], 87 [*Attila rufus*], 88 [*Myiodynastes maculatus solitarius*], 90 [*Tyrannus dominicensis vorax*].
Vieillot (1820). *Faune Française*: 173 [*Chersophilus duponti*].
Vieillot (1820). *Tabl. Encyc. Méth. Orn.*: 322 [*Calandrella rufescens*].
Vieillot (1823). *Tabl. Encyc. Méth. Orn.*: 855 [*Xolmis cinereus pepoaza*, *Xolmis coronatus*], 856 [*Neoxolmis rufiventris*, *Xolmis irupero*, *Xolmis dominicanus*].
Vieillot (1824). *Gal. Ois.* **1(2)**: 209 [*Alectrurus risora*].
Vigors (1839). *Zool. Beechey's Voy. Pacific & Behring's Strait*: 17 [*Sayornis nigricans semiatra*].
Vincent (1933). *Bull. Brit. Orn. Club* **53**: 131 [*Anthus cinnamomeus lichenya*], 143 [*Ptyonoprogne fuligula fusciventris*].
Wagler (1830). *Isis von Oken*: col. 931 [*Chiroxiphia lanceolata*].
Wagler (1831). *Isis von Oken*: col. 530 [*Eremophila alpestris chrysolaema*].
Wahlberg (1855). *Oefv. Kongl. Vet.-Akad. Forh.* **12**: 213 [*Ammomanopsis grayi*].
Walden (1875). *Trans. Zool. Soc. London* **9(2)**: 198 [*Anthus rufulus lugubris*].
Wallace (1864). *Proc. Zool. Soc. London* **1863**: 488 [*Anthus rufulus medius*].
Weigold (1913). *Orn. Monatsber.* **21**: 124 [*Alauda arvensis sierrae*].
Wetmore (1928). *Proc. Biol. Soc. Washington* **41**: 201 [*Contopus hispaniolensis tacitus*].
Wetmore (1939). *Smiths. Misc. Coll.* **98(4)**: 5 [*Pyrrhomyias cinnamomeus spadix*], 6 [*Capsiempis flaveola cerulus*].
Wetmore (1942). *Auk* **59**: 267 [*Empidonax flavescens imperturbatus*].
Wetmore (1946). *Smiths. Misc. Coll.* **106(16)**: 5 [*Cnemarchus erythropygius orinomus*], 7 [*Ochthoeca diadema rubellula*], 8 [*Ochthoeca rufipectoralis rubicundula*].
Wetmore (1953). *Smiths. Misc. Coll.* **122(8)**: 7 [*Phaeomyias murina eremonoma*].
Wetmore (1957). *Smiths. Misc. Coll.* **134(9)**: 65 [*Contopus cinereus aithalodes*], 70 [*Camptostoma obsoletum orphnum*], 71 [*Leptopogon amaurocephalus idius*].
Wetmore (1959). *Smiths. Misc. Coll.* **139(2)**: 7 [*Manacus vitellinus amitinus*].
Wetmore (1963). *Smiths. Misc. Coll.* **145(6)**: 7 [*Myiopagis caniceps absita*].
Wetmore (1972). *Smiths. Misc. Coll.* **150(3)**: 351 [*Schiffornis turdinu acrolophites*].
Wetmore & Peters, J.L. (1923). *Proc. Biol. Soc. Washington* **36**: 143 [*Stigmatura budytoides inzonata*].
Wetmore & Phelps, Jr (1956). *Proc. Biol. Soc. Washington* **69**: 7 [*Phyllomyias burmeisteri bunites*].
Whistler (1928). *Bull. Brit. Orn. Club* **49**: 52 [*Galerida cristata lynesi*].
Whistler (1936). *J. Bombay Nat. Hist. Soc.* **38**: 766 [*Anthus rufulus waitei*].
Whitaker (1898). *Bull. Brit. Orn. Club* **7**: xlvii [*Eremophila alpestris atlas*].
Whitaker (1898). *Ibis* **7(4)**: 603 [*Galerida theklae ruficolor*].
Whitaker (1904). *Bull. Brit. Orn. Club* **15**: 20 [*Alauda arvensis harterti*].
White, C.M.N. (1943). *Bull. Brit. Orn. Club* **64**: 20 [*Mirafra africana kabalii*], 21 [*Calendulauda africanoides trapnelli*].
White, C.M.N. (1944). *Bull. Brit. Orn. Club* **65**: 5 [*Mirafra africana gomesi*].
White, C.M.N. (1945). *Bull. Brit. Orn. Club* **66**: 15 [*Mirafra rufocinnamomea lwenarum*].
White, C.M.N. (1948). *Ibis*: 549 [*Anthus leucophrys ansorgei*].
White, C.M.N. (1956). *Bull. Brit. Orn. Club* **76(4)**: 57-58 [*Mirafra rufocinnamomea pintoi*], 58 [*Mirafra rufocinnamomea schoutedeni*, *Mirafra rufocinnamomea smithersi*]; **76(9)**: 160 [*Hirundo aethiopica amadoni*].
White, C.M.N. (1959). *Bull. Brit. Orn. Club* **79(3)**: 52 [*Eremopterix leucotis hoeschi*].
White, C.M.N. (1960). *Bull. Brit. Orn. Club* **80(1)**: 11 [*Mirafra rufocinnamomea serlei*]; **80(2)**: 24-25 [*Calandrella blanfordi daaroodensis*]; **80(7)**: 132 [*Calandrella somalica perconfusa*].
White, C.M.N. (1961). *Bull. Brit. Orn. Club* **81(2)**: 33 [*Chersomanes albofasciata barlowi*].

Wied (1820). *Reise Bras.* **1**: 168 [*Carpornis melanocephala*], 242 [*Lipaugus vociferans*], 262 [*Xipholena atropurpurea*], 345 [*Atticora melanoleuca*].
Wied (1821). *Reise Bras.* **2**: 141 [=151] [*Myiobius barbatus mastacalis*].
Wied (1831). *Beitr. Naturg. Brasil* **3(2)**: 723 [*Camptostoma obsoletum cinerascens*], 817 [*Schiffornis turdina*], 829 [*Neopelma aurifrons*], 868 [*Attila spadiceus uropygiatus*], 871 [*Conopias trivirgatus*], 902 [*Cnemotriccus fuscatus*], 923 [*Sublegatus modestus*], 929 [*Tolmomyias flaviventris*], 945 [*Euscarthmus*], 947 [*Euscarthmus meloryphus*], 950 [*Hemitriccus nidipendulus*], 953 [*Polystictus superciliaris*], 955 [*Myiornis auricularis cinereicollis*], 958 [*Hemitriccus orbitatus*], 964 [*Todirostrum poliocephalum*], 974 [*Platyrinchus leucoryphus*].
Williams (1957). *Bull. Brit. Orn. Club* **77**: 157 [*Spizocorys personata mcchesneyi*].
Willis & Oniki (1992). *Bull. Brit. Orn. Club* **112**: 158 [*Phylloscartes kronei*].
Winterbottom (1956). *Ostrich* **27**: 156 [*Mirafra apiata marjoriae*].
Winterbottom (1958). *Ann. S. Afr. Mus.* **44(3)**: 59 [*Chersomanes albofasciata macdonaldi*].
Winterbottom (1963). *Ann. S. Afr. Mus.* **46**: 348 [*Anthus vaalensis exasperatus*].
Witherby (1903). *Bull. Brit. Orn. Club* **14**: 29 [*Mirafra somalica*].
Witherby (1905). *Ibis* **Ser. 8, no. 5**: 513 [*Alaemon hamertoni altera*, *Alaemon hamertoni*], 514 [*Spizocorys obbiensis*].
Witherby (1917). *Bull. Brit. Orn. Club* **37**: 44 [*Anthus trivialis haringtoni*].
Witherby (1921). *Bull. Brit. Orn. Club* **41**: 69 [*Alauda arvensis guillelmi*].
Xántus de Vesey (1858). *Proc. Acad. Nat. Sci. Philadelphia* **10**: 117 [*Empidonax hammondii*].
Zaliesski (1917). *Mess. Orn.* **8**: 125 [*Alauda arvensis kiborti*].
Zarudny (1902). *Orn. Monatsber.* **10**: 54 [*Lullula arborea pallida*].
Zarudny (1911). *Mess. Orn.* **2**: 10 [*Ammomanes deserti iranica*].
Zarudny (1916). *Orn. Mitt.* **7**: 36 [*Riparia riparia innominata*].
Zarudny & Loudon (1904). *Orn. Jahrb.* **15**: 224 [*Ammomanes deserti orientalis*].
Zedlitz (1908). *Orn. Monatsber.* **16**: 177 [*Ptyonoprogne fuligula pusilla*].
Zimmer, J.T. (1929). *Proc. Biol. Soc. Washington* **42**: 85 [*Dixiphia pipra microlopha*].
Zimmer, J.T. (1930). *Field Mus. Nat. Hist. Publ., Zool. Ser.* **17**: 365 [*Ochthoeca leucophrys interior*], 368 [*Colonia colonus niveiceps*], 384 [*Todirostrum cinereum peruanum*].
Zimmer, J.T. (1936). *Amer. Mus. Novit.* **889**: 2 [*Pipra fasciicauda saturata*], 5 [*Pipra aureola borbae*], 9 [*Dixiphia pipra occulta*], 10 [*Dixiphia pipra pygmaea*], 12 [*Dixiphia pipra discolor*], 14 [*Dixiphia pipra separabilis*], 17 [*Machaeropterus pyrocephalus pallidiceps*], 19 [*Manacus manacus longibarbatus*], 22 [*Schiffornis turdina aenea*], 26 [*Schiffornis major duidae*]; **893**: 2 [*Pipreola riefferii confusa*]; **894**: 6 [*Pachyramphus castaneus amazonas*], 10 [*Pachyramphus cinnamomeus tenebrosus*], 17 [*Pachyramphus albogriseus guayaquilensis*].
Zimmer, J.T. (1937). *Amer. Mus. Novit.* **930**: 7 [*Ochthoeca fumicolor ferruginea*]; **962**: 7 [*Tyrannus savana sanctaemartae*], 8 [*Tyrannus savana circumdatus*]; **963**: 7 [*Myiodynastes maculatus tobagensis*], 9 [*Myiodynastes maculatus difficilis*], 10 [*Ochthoeca leucophrys urubambae*], 11 [*Myiodynastes maculatus chapmani*], 22 [*Myiozetetes granadensis occidentalis*].
Zimmer, J.T. (1938). *Amer. Mus. Novit.* **994**: 9 [*Myiarchus cephalotes interior*], 30 [*Cnemotriccus fuscatus duidae*].
Zimmer, J.T. (1938). *Auk* **55**: 664 [*Xenotriccus mexicanus*].
Zimmer, J.T. (1939). *Amer. Mus. Novit.* **1042**: 6 [*Terenotriccus erythrurus venezuelensis*, *Terenotriccus erythrurus signatus*], 7 [*Terenotriccus erythrurus amazonus*], 9 [*Myiobius barbatus insignis*], 10 [*Myiobius villosus clarus*], 11 [*Myiobius atricaudus adjacens*], 12 [*Myiobius atricaudus connectens*]; **1043**: 8 [*Platyrinchus mystaceus duidae*]; **1045**: 4 [*Tolmomyias sulphurescens inornatus*], 5 [*Tolmomyias sulphurescens insignis*], 6 [*Tolmomyias sulphurescens mixtus*], 7 [*Tolmomyias sulphurescens duidae*], 8 [*Tolmomyias sulphurescens confusus*], 10 [*Tolmomyias assimilis obscuriceps*], 11 [*Tolmomyias assimilis clarus*], 12 [*Tolmomyias assimilis neglectus*, *Tolmomyias assimilis calamae*], 13 [*Tolmomyias assimilis paraensis*], 16 [*Tolmomyias flaviventris dissors*], 17 [*Rumphotrigon megacephalum bolivianum*].
Zimmer, J.T. (1939). *Proc. Biol. Soc. Washington* **52**: 168 [*Inezia subflava obscura*].
Zimmer, J.T. (1940). *Amer. Mus. Novit.* **1066**: 3 [*Todirostrum chrysocrotaphum simile*], 6 [*Todirostrum maculatum annectens*, *Todirostrum maculatum diversum*], 8 [*Poecilotriccus latirostris mixtus*], 10 [*Poecilotriccus plumbeiceps obscurum*], 14 [*Hemitriccus zosterops flaviviridis*], 20 [*Lophotriccus vitiosus guianensis*, *Lophotriccus vitiosus affinis*], 23 [*Ochthoeca leucophrys dissors*]; **1095**: 1 [*Phylloscartes ventralis tucumanus*], 14 [*Serpophaga hypoleuca venezuelana*].
Zimmer, J.T. (1941). *Amer. Mus. Novit.* **1108**: 6 [*Elaenia albiceps urubambae*], 8 [*Elaenia albiceps diversa*], 16 [*Elaenia obscura sordida*], 17 [*Elaenia pallatangae intensa*]; **1109**: 5 [*Sublegatus arenarum orinocensis*], 6 [*Sublegatus arenarum pallens*], 8 [*Phaeomyias murina maranonica*], 14 [*Camptostoma obsoletum bolivianum*], 18 [*Phyllomyias nigrocapillus aureus*], 21 [*Zimmerius chrysops cumanensis*], 23 [*Zimmerius gracilipes gilvus*]; **1126**: 19 [*Pyrocephalus rubinus cocachacrae*], 20 [*Pyrocephalus rubinus piurae*], 21 [*Pyrocephalus rubinus ardens*].
Zimmer, J.T. (1942). *Amer. Mus. Novit.* **1203**: 14 [*Ochthoeca rufipectoralis obfuscata*].
Zimmer, J.T. (1945). *Proc. Biol. Soc. Washington* **58**: 45 [*Hemitriccus zosterops naumburgae*].
Zimmer, J.T. (1947). *Auk* **64**: 453 [*Muscisaxicola maculirostris niceforoi*].
Zimmer, J.T. (1952). *Proc. Biol. Soc. Washington* **65**: 31 [*Anthus chacoensis*].
Zimmer, J.T. (1953). *Amer. Mus. Novit.* **1605**: 1 [*Myiarchus tuberculifer littoralis*], 8 [*Hemitriccus kaempferi*]; **1649**: 24 [*Anthus bogotensis meridae*].
Zimmer, J.T. (1955). *Amer. Mus. Novit.* **1749**: 11 [*Stigmatura budytoides gracilis*].
Zimmer, J.T. & Phelps, Sr (1944). *Amer. Mus. Novit.* **1270**: 10 [*Pipreola whitelyi kathleenae*], 11 [*Phyllomyias burmeisteri viridiceps*].
Zimmer, J.T. & Phelps, Sr (1945). *Amer. Mus. Novit.* **1274**: 5 [*Platyrinchus mystaceus imatacae*].
Zimmer, J.T. & Phelps, Sr (1946). *Amer. Mus. Novit.* **1312**: 11 [*Myiarchus ferox brunnescens*], 12 [*Myiarchus tuberculifer pallidus*], 14 [*Elaenia cristata alticola*, *Platyrinchus mystaceus ptaritepui*], 15 [*Leptopogon amaurocephalus orinocensis*].
Zimmer, J.T. & Phelps, Sr (1947). *Amer. Mus. Novit.* **1338**: 5 [*Ramphotrigon megacephalum pectorale*], 6 [*Notiochelidon murina meridensis*].
Zimmer, J.T. & Phelps, Sr (1952). *Amer. Mus. Novit.* **1544**: 6 [*Elaenia dayi auyantepui*].
Zimmer, J.T. & Phelps, Sr (1954). *Amer. Mus. Novit.* **1657**: 1 [*Myiophobus flavicans caripensis*].
Zimmer, J.T. & Phelps, Sr (1955). *Amer. Mus. Novit.* **1709**: 3 [*Myiopagis viridicata zuliae*].
Zimmer, K.J., Whittaker & Oren (2001). *Auk* **118(1)**: 59-62 [*Suiriri islerorum*].

GENERAL LIST OF REFERENCES

Abdulali, H. (1975a). On a new subspecies of the skylark *Alaud gulgula* Franklin in Gujarat, India. *J. Bombay Nat. Hist. Soc.* **72**: 448–449.

Abdulali, H. (1975b). On the validity of *Riparia riparia indica* Ticehurst and extension of range of *Riparia riparia ijimae* (Lonnberg). *J. Bombay Nat. Hist. Soc.* **72**: 853-854.

Abdulali, H. (1976). A catalogue of the birds in the collection of the Bombay Natural History Society - 18. *J. Bombay Nat. Hist. Soc.* **72**: 477-505.

Abdulali, H. (1978). On the validity of the Bush Lark, *Mirafra assamica ceylonensis* Whistler. *Spolia Zeylanica* **32(2)**: 141-142.

Abdusalyamov, I.A. (1973). [*Fauna of the Tadjik Soviet Socialist Republic: Birds*]. Vol. 19. Donish, Dushanbe, Tajikistan. In Russian.

Abs, M. (1963). *Vergleichende Untersuchungen an Haubenlerche* (Galerida cristata *(L.)) und Theklalerche* (Galerida theklae *A.E. Brehm) (Aves Alaudidae, ein Beitrag zur Evolution der Zwillingsarten)*. Bonner Zoologische Beiträge **14**. 128 pp.

Accordi, I.A., Silveira, A.B. & Menezes, M.M. (2000). Composição da avifauna nas áreas urbana e rural do município de Estância Velha, Rio Grande do Sul. Pp. 200-201 in: Straube *et al.* (2000). (Abstract).

Acheson, N. & Davis, S. (2001). Birding in Parque Nacional Noel Kempff Mercado, Bolivia. *Cotinga* **16**: 95-100.

Acosta, M. & Múgica, L. (1990). Preferencias tróficas de la Golondrina de Árboles (*Tachycineta bicolor*) (Vieillot). *Cienc. Biol. Acad. Cienc. Cuba* **23**: 121-124.

Adamian, M.S. (1963). [Bimaculated Lark in Armeniya]. *Ornitologiya* **6**: 238–245. In Russian.

Adamian, M.S. & Klem, D. (1999). *Handbook of the Birds of Armenia*. American University of Armenia, Oakland & Yerevan.

Adams, N.J. & Slotow, R.H. eds. (1999). *Proceedings of the XXII International Ornithological Congress, Durban 1998*. BirdLife South Africa, Johannesburg.

Adams, W. & Templeton, R. (1979). Ornithology. Pp. 32-53 in: *Cambridge Expedition to Tierra del Fuego 1977*. Cambridge University, Cambridge, UK.

Adolph, S.C. & Roughgarden, J. (1983). Foraging by passerine birds and *Anolis* lizards on St. Eustatius, Netherlands Antilles: implications of inter-class competition and predation. *Oecologia* **56**: 313-317.

Afik, D., Ward, D. & Shkedy, Y. (1991). A test of the self-incubation hypothesis for desert birds that build a rampart of stones in front of their nests. *J. Therm. Biol.* **16(5)**: 255-260.

Agro, D.J. & Ridgely, R.S. (1998). First record of the Striped Manakin *Machaeropterus regulus* in Guyana. *Bull. Brit. Orn. Club* **118(2)**: 122-123.

Aguilar, T.M., Leite, L.O. & Marini, M.Â. (1999). Biologia da nidificação de *Lathrotriccus euleri* (Cabanis, 1968) (Tyrannidae) em fragmentos de mata de Minas Gerais. [Nesting biology of the Dusky Flycatcher (*Lathrotriccus euleri*) (Cabanis, 1968) (Tyrannidae) in Minas Gerais forest fragments]. *Ararajuba* **7(2)**: 125-133. In Portuguese with English summary.

Aguilar, T.M., Maldonado-Coelho, M. & Marini, M.Â. (2000). Nesting biology of the Gray-hooded Flycatcher (*Mionectes rufiventris*). *Orn. Neotropical* **11(3)**: 223-230. In English with Portuguese summary.

Aguirre, J. (1997). Nueva observación del Pájaro Amarillo *Pseudocolopterix flaviventris*, (Passeriformes: Tyrannidae) en la desembocadura del río Maipo, región de Valparaiso, Chile. *Bol. Chileno Orn.* **4**: 39-40.

Ainsley, D.T.J. (1992). *Vocalizations and Nesting Behaviour of the Pacific-slope Flycatcher,* Empidonax difficilis. MSc thesis, University of Victoria, Victoria, Canada.

Akhtar, S.A. & Prakash, V. (1989). Streakeyed Pied Wagtail, *Motacilla alba ocularis* Swinhoe from Harike Lake, Punjab. *J. Bombay Nat. Hist. Soc.* **86(2)**: 246.

Al-Rawy, M.A. & Kainady, P.V.G. (1976). Development of temperature regulation in nestling Common Swallows *Hirundo rustica*. *Bull. Basrah Nat. Hist. Mus.* **3**: 77-88.

Alabarce, E. & Antelo, C. (1993). Análisis del régimen alimenticio de *Mecocerculus leucophrys* (Tyrannidae) y de *Myioborus brunniceps* (Parulidae) en la taxocenosis de aves de Las Juntas-Catamarca. *Acta Zool. Lilloana* **42(2)**: 245-252.

Alabarce, E. & Periss, S. (1991). La avifauna postreproductiva de los pastizales de altura (Tafí del Valle, Sierra de Aconquija, Tucumán). *Acta Zool. Lilloana* **40(1)**: 125-133.

Alba, E. (1981). Observaciones del Bisbita de Richard (*Anthus novaeseelandiae*) en la provincia de Málaga. [Observations on *Anthus novaeseelandiae* in the province of Malaga (Spain)]. *Ardeola* **28**: 139-140.

Albert, F. (1898). *Contribuciones al Estudio de Aves Chilenas*. Anales de la Universidad de Chile **1**, Santiago, Chile.

Alcorn, J.R. (1988). *The Birds of Nevada*. Fairview West, Fallon, Nevada.

Aldrich, J.W. (1951). A review of the races of the Traill's Flycatcher. *Wilson Bull.* **63(3)**: 192-197.

Aldrich, J.W. (1953). Habits and habitat differences in two races of Traill's Flycatcher. *Wilson Bull.* **65(1)**: 8-11.

Aleixo, A. (1997). Range extension of the Large-headed Flatbill *Ramphotrigon megacephala* with comments on its distribution. *Bull. Brit. Orn. Club* **117(3)**: 220-223.

Aleixo, A. & Galetti, M. (1997). The conservation of the avifauna in a lowland Atlantic forest in south-east Brazil. *Bird Conserv. Int.* **7(3)**: 235-261.

Aleixo, A., Whitney, B.M. & Oren, D.C. (2000). Range extensions of birds in southeastern Amazonia. *Wilson Bull.* **112(1)**: 137-142.

Alexander, B. (1898a). An ornithological expedition to the Cape Verde Islands. *Ibis* **Ser. 7, no. 4**: 74-118.

Alexander, B. (1898b). Further notes on the ornithology of the Cape Verde Islands. *Ibis* **Ser. 7, no. 4**: 277-285.

Alexander-Marrack, P. (1994). Notes on a breeding colony of the African River Martin *Pseudochelidon eurystomina* in Gabon. *Malimbus* **16(1)**: 1-9.

Ali, S. (1969). *Birds of Kerala*. Oxford University Press, Madras, India.

Ali, S. (1979). *Indian Hill Birds*. Oxford University Press, Delhi.

Ali, S. (1996). *The Book of Indian Birds*. 12th revised and enlarged centenary edition. Bombay Natural History Society, Bombay.

Ali, S. & Ripley, S.D. (1987). *Handbook of the Birds of India and Pakistan*. Vol. 5. 2nd edition. Oxford University Press, Delhi.

Ali, S. & Ripley, S.D. (1998). *Handbook of the Birds of India and Pakistan*. Vol. 9. 2nd edition. Oxford University Press, Delhi.

Ali, S., Biswas, B. & Ripley, S.D. (1996). *The Birds of Bhutan*. Zoological Survey of India Occasional Paper **136**, Calcutta.

Allan, D.G. (1986). The Blue Swallow, next bird for extinction? *Quagga* **15**: 27-29.

Allan, D.G. (1988). The Blue Swallow in with a chance. *Quagga* **22**: 5-7.

Allan, D.G. (2001). Breeding and vocalizations of Rudd's Lark - the vanishing ventriloquist. *Bird Numbers* **10**: 29-35.

Allan, D.G. & Harris, T. (1984). Rock Pipit breeding in the Transvaal. *Witwatersrand Bird Club News* **124**: 2.

Allan, D.G., Batchelor, G.R. & Tarboton, W.R. (1983). Breeding of Botha's Lark. *Ostrich* **54(1)**: 55-57.

Allan, D.G., Gamble, K., Johnson, D.N., Parker, V., Tarboton, W.R. & Ward, D.M. (1987). *Report on the Blue Swallow in South Africa and Swaziland*. PFIAO, University of Cape Town, Cape Town.

Allan, D.G., Harrison, J.A., Navarro, R.A., van Wilgen, B.W. & Thompson, M.W. (1997). The impact of commercial afforestation on bird populations in Mpumalanga Province, South Africa: insights from bird atlas data. *Biol. Conserv.* **79(2/3)**: 173-185.

Allen, E.F. (1948). Nidification and other field notes on some Malayan birds. *Malay. Nat. J.* **3**: 82-86.

Allen, P.E. (1996). Breeding biology and natural history of the Bahama Swallow. *Wilson Bull.* **108(3)**: 480-495.

Allen, P.E. (1997a). Breeding biology and natural history of the Bahama Swallow. *Bahamas J. Sci.* **5(1)**: 20-28.

Allen, P.E. (1997b). Breeding biology and natural history of the Bahama Swallow. *Pitirre* **10(1)**: 19. In English and Spanish.

Allen, P.E. (1998). Conservation of the Bahama Swallow. *Sialia* **20(4)**: 127-129.

Allen, P.E. & Hitchcox, S.M. (1997). Impact of forest management options on cavity-nesting birds in the Bahamas. *Pitirre* **10(1)**: 20.

Allen, R.P. (1961). *Birds of the Caribbean*. Viking Press, New York.

Allen, R.W. & Nice, M.M. (1952). A study of the breeding biology of the Purple Martin. *Amer. Midl. Nat.* **47**: 606-665.

Allen, S. (1995). *A Birder's Guide to Explorer's Inn*. Published privately.

Allen, S. (1998). *A Birder's Guide to Mindo, Ecuador*. Published privately.

Allouse, B.E. (1953). *The Avifauna of Iraq*. Publications of the Iraq Natural History Museum **3**, Bagdad.

Allport, G., Ausden, M., Hayman, P.V., Robertson, P. & Wood, P. (1989). *The Conservation of the Birds of Gola Forest, Sierra Leone*. ICBP Study Report **38**, Cambridge.

de Almeida, A.C.C. & Teixeira, D.M. (1996). Sobre a biologia de *Procnias nudicollis* (Vieillot, 1817) (Aves, Cotingidae). Page 2 in: Anon. (1996e). (Abstract).

de Almeida, A.C.C. & Teixeira, D.M. (1997). Sobre a biologia de *Iodopleura leucopygia* Salvin 1885 no nordeste do Brasil (Cotingidae). Page 161 in: Marini (1997). (Abstract).

Alström, P. (1988). Identification of Blyth's Pipit. *Birding World* **1**: 268-272.

Alström, P. (1989). Blyth's versus Richard's Pipit: comment. *Birding World* **2**: 213.

Alström, P. (1998). Taxonomy of the *Mirafra assamica* complex. *Forktail* **13**: 97-107.

Alström, P. (2002). *Species Limits and Systematics in some Passerine Birds*. PhD thesis, Uppsala University, Uppsala.

Alström, P. & Krister, M. (1989). Red-throated Pipits with rufous throat in winter. *Dutch Birding* **11(2)**: 78-81.

Alström, P. & Mild, K. (1988). Calls of Blyth's Pipit. *British Birds* **81**: 655.

Alström, P. & Mild, K. (1989). Identification of Pechora Pipit. *Birding World* **2**: 276-282.

Alström, P. & Mild, K. (1993). The taxonomic status of *Anthus berthelotii*. *Bull. Brit. Orn. Club* **113(2)**: 88-92.

Alström, P. & Mild, K. (1996). The identification of Rock, Water and Buff-bellied Pipits. *Alula* **2(4)**: 164-175.

Alström, P. & Mild, K. (1997a). Die Bestimmung des Wasserpieper Komplexes: Berg- *Anthus spinoletta*, Strand- *A. petrosus*, Pazifikpieper *A. rubescens* und Rosenpieper *A. roseatus*. [The identification of the Water Pipit complex: *Anthus spinoletta*, *A. petrosus*, *A. rubescens* and Rosy Pipit *A. roseatus*]. *Limicola* **11(1)**: 1-24. In German with English summary.

Alström, P. & Mild, K. (1997b). Die Bestimmung des Steppenpiepers *Anthus godlewskii*. [Identification of Blyth's Pipit *Anthus godlewskii*]. *Limicola* **11(3)**: 97-119. In German with English summary.

Alström, P. & Mild, K. (2003). *Pipits & Wagtails of Europe, Asia and North America. Identification and Systematics*. Christopher Helm, London.

Alström, P. & Ödeen, A. (2002). Incongruence between mitochondrial DNA, nuclear DNA and non-molecular data in the avian genus *Motacilla*: implications for estimates of species phylogenies. In: Alström, P. (2002). *Species Limits and Systematics in some Passerine Birds*. PhD thesis. Uppsala University, Uppsala.

Alström, P., Mild, K. & Zetterström, B. (1991). [Field identification of the Lesser Short-toed Lark]. *Vår Fågelvärld* **50(1)**: 54-57. In Swedish with English summary.

Alström, P., Mild, K. & Zetterström, B. (1992). Identification of Lesser Short-toed Lark. *Birding World* **4(12)**: 422-427.

Alström, P., Mild, K. & Zetterström, B. (2004). *Larks of Europe, Asia and North America: Identification and Systematics*. Christopher Helm, London.

Altman, B. (1999). Nest success and habitat relationships of the Olive-sided Flycatcher in managed forests of northwestern Oregon. Unpublished report to the US Fish and Wildlife Service, Oregon State Office, Portland, Oregon.

Altman, B. & Sallabanks, R. (2000). Olive-sided Flycatcher (*Contopus cooperi*). No. **502** in: Poole & Gill (2000a).

Álvarez, J. (2000). The breeding system of the Orange-crowned Manakin. *Condor* **102(1)**: 181-186.

Álvarez, J. (2001). The cryptic nest of the Orange-crowned Manakin *Heterocercus aurantiivertex*. *Cotinga* **16**: 87-89.

Álvarez, J. & Whitney, B.M. (2001). A new *Zimmerius* tyrannulet (Aves: Tyrannidae) from white sand forests of northern Amazonian Peru. *Wilson Bull.* **113(1)**: 1-9.

Álvarez, J. & Whitney, B.M. (2003). New distributional records of birds from white-sand forests of the northern Peruvian Amazon, with implications for biogeography of northern South America. *Condor* **105(3)**: 552-566.

Álvarez del Toro, M. (1980). *Las Aves de Chiapas*. Universidad Autónoma de Chiapas, Tuxtla Gutiérrez, Chiapas, Mexico.

Álvarez-Cordero, E., de Samudio, J., Márquez, C. & Ellis, S. (1994). *Conservation Assessment and Management Plan Workshop for Bird and Mammal Species Endemic to Panama*. International Union for Nature Conservation and Natural Resources, Apple Valley, Minnesota.

Alves, M.A.S. (1997). Effects of ectoparasites on the Sand Martin *Riparia riparia* nestlings. *Ibis* **139(3)**: 494-496.

Alves, M.A.S. & Bryant, D.M. (1998). Brood parasitism in the Sand Martin, *Riparia riparia*: evidence for two parasitic strategies in a colonial passerine. *Anim. Behav.* **56**: 1323-1331.

Alves, M.A.S. & Bryant, D.M. (2003). Responses to experimental brood parasitism in Sand Martins, *Riparia riparia*. *Ibis* **145(1)**: 156-159.

Alves, M.A.S. & Cavalcanti, R.B. (1996). Sentinel behavior, seasonality, and the structure of bird flocks in a Brazilian savanna. *Orn. Neotropical* **7**: 43-51.

Alves, M.A.S. & Pereira, E.F. (1998). Richness, abundance and seasonality of bird species in a laggon of an urban area (Lagoa Rodrigo de Freitas) of Rio de Janeiro, Brazil. *Ararajuba* **6(2)**: 110-116.

Alves, M.A.S., da Silva, J.M.C., Van Sluys, M., Bergallo, H.G. & da Rocha, C.F.D. (2000). *A Ornitologia no Brasil: Pesquisa Atual e Perspectivas*. Universidade do Estado do Rio de Janeiro, Rio de Janeiro.

Alves, V.S. & Soneghet, M.L.L. (1999). Ninhos, ovos e filhotes de *Ochthornis littoralis* (Passeriformes: Tyrannidae). [Nest, eggs and chicks of *Ochthornis littoralis* (Passeriformes: Tyrannidae)]. *Ararajuba* **7(1)**: 27-29. In Portuguese with English summary.

Amadon, D. (1953). Avian systematics and evolution in the Gulf of Guinea, the J. G. Correira collection. *Bull. Amer. Mus. Nat. Hist.* **100(3)**: 393-452.

Amadon, D. & Eckelberry, D.R. (1955). Observations on Mexican birds. *Condor* **57(2)**: 65-80.
Amat, J.A. (1998). Nesting biology of the Yellow Wagtail *Motacilla flava* in southwestern Iberia. *Ardeola* **45(1)**: 83-85.
Ambrosini, R., Bolzern, A.M., Canova, L., Arieni, S., Møller, A.P. & Saino, N. (2002). Distribution and colony size of Barn Swallows (*Hirundo rustica*) in relation to animal farming and land use in an agricultural area. *J. Appl. Ecol.* **39**: 524-534.
Ames, P.L. (1971). *The Morphology of the Syrinx in Passerine Birds*. Peabody Museum of Natural History Yale University Bulletin **37**. New Haven, Connecticut. 194 pp.
Ames, P.L., Heimerdinger, M.A. & Warter, S.L. (1968). The anatomy and systematic position of the ant pipits *Conopophaga* and *Corythopis*. *Postilla* **114**: 32.
Amos, E.J.R. (1991). *A Guide to the Birds of Bermuda*. Published privately, Warwick.
Ananian, V. & Busuttil, S. (2002). The first breeding records of Citrine Wagtail *Motacilla citreola* and Savi's Warbler *Locustella luscinioides* in Armenia. *Sandgrouse* **24(1)**: 52.
Anciães, M. & de Lama, S.N. (2002). Sex identification of Pin-tailed Manakins (*Ilicura militaris*: Pipridae) using the polymerase chain reaction and its application to behavioral studies. *Orn. Neotropical* **13(2)**: 159-165.
Anciães, M. & Straube, F.C. (1997). A relação entre altitude e latitude na distribução de *Ilicura militaris* (Pipridae, Passeriformes). Page 130 in: Marini (1997). (Abstract).
Anciães, M., Coehlo, M.M. & Chaves, P.H. (2001). Records for the Elegant Mourner (*Laniisoma elegans*) in forest fragments of Minas Gerais State, Brazil. *Melopsittacus* **4(1)**: 44-46.
Anciães, M., Sebaio, F. & Marini, M.Â. (2000). Um caso de variação na plumagem de *Ilicura militaris* (Pipridae, Passeriformes). Pp. 277-279 in: Straube *et al.* (2000). (Abstract).
Andersen, G.S., Klann, M., Sandve, G. & Tveit, B.O. (1993). A large breeding colony of Citrine Wagtails in eastern Turkey. *Bull. Orn. Soc. Middle East* **30**: 27-28.
Anderson, A.B. (1981). White-sand vegetation of Brazilian Amazonia. *Biotropica* **13**: 199-210.
Anderson, C. & Rozzi, R. (2000). Bird assemblages in the southernmost forests of the world: methodological variations for determining species composition. *An. Inst. Pat. Ser. Cienc. Nat. Punta Arenas* **28**: 89-100.
Anderson, D.A. (1989). Evidence of nesting by the Water Pipit in the Oregon Cascades. *Oregon Birds* **15(3)**: 213-214.
Anderson, D.L., Bonta, M. & Thorn, P. (1998). New and noteworthy bird records from Honduras. *Bull. Brit. Orn. Club* **118(3)**: 178-183.
Anderson, R.C. & Baldock, M. (2001). New records of birds from the Maldives with notes on other species. *Forktail* **17**: 67-73.
Andersson, J. & Larsson, F. (1985). First record of a Bimaculated Lark, *Melanocorypha bimaculata*, in Sweden. *Vår Fågelvärld* **44(6)**: 353-354.
Andors, A.V. & Vuilleumier, F. (1995). Breeding of *Anthus furcátus* (Aves: Motacillidae) in northern Patagonia, with a review of the breeding biology of the species. *Orn. Neotropical* **6**: 37-52.
Andors, A.V. & Vuilleumier, F. (1996). Breeding of *Agriornis murina* (Aves: Tyrannidae) in Patagonia, with comments on its habitat preferences and taxonomic position. *Orn. Neotropical* **7**: 109-118.
Andors, A.V. & Vuilleumier, F. (1998). Observations on the distribution, behavior, and comparative biology of *Neoxolmis rufiventris* (Aves, Tyrannidae). *Amer. Mus. Novit.* **3220**: 1-32.
Andrade, M.A. (1996). Observaciones sobre el Pájaro Torero (*Pyroderus s. scutatus*) en el Brasil. *Bol. Soc. Antioqueña Orn.* **7(12-13)**: 8-12.
Andreassen, E.M. & Bryne, O. (1978). [First record of Pechora Pipit in Norway]. *Cinclus* **1(1)**: 1-4. In Norwegian with English summary.
Andrew, D.G. (1993). House Martins taking over Barn Swallow's nest. *British Birds* **86**: 184-185.
Andrew, P. (1992). *The Birds of Indonesia. A Checklist (Peters' Sequence)*. Kukila Checklist **1**. Indonesian Ornithological Society, Jakarta.
Andrew, P. & Holmes, D.A. (1990). Sulawesi bird report. *Kukila* **5(1)**: 4-26.
Andrews, R. & Righter, R. (1992). *Colorado Birds: a Reference to their Distribution and Habitat*. Denver Museum of Natural History, Denver, Colorado.
d'Andurain, P., Cramm, P. & Olioso, G. (1999). Pipit rousseline *Anthus campestris*. Pp. 424-425 in: Rocamora & Yeatman-Berthelot (1999).
Angehr, G. (1998). The Panama Important Bird Areas Program. Page 7 in: Anon. (1998b). (Abstract).
Angehr, G. (2000a). Red data bird: Yellow-billed Cotinga. *World Birdwatch* **22(2)**: 24-25.
Angehr, G. (2000b). The field editor's report. *Tucan* **26(2)**: 3-5.
Angehr, G. (2003). *Directorio de Áreas Importantes para Aves en Panamá. Directory of Important Bird Areas in Panama*. Sociedad Audobon de Panamá, Panamá. In Spanish and English.
Angehr, G. & Aucca, C. (1997). *Birds: Biodiversity Assessment in the Lower Urubamba Region*. SPDP & Smithsonian Institute of Conservation Biology, Washington, D.C.
Angehr, G. & Jordan, O. (1998). *Report on the Panama Important Bird Areas Program*. Panama Audubon Society/ BirdLife International, Ancón, Panamá.
Angehr, G., Christian, D.G. & Aparicio, K.M. (2004). A survey of the Serranía de Jungurudó, an isolated mountain range in eastern Panama. *Bull. Brit. Orn. Club* **124(1)**: 51-62.
dos Anjos, L. (1990). Distribução de aves en uma floresta de araucária da Cidade de Curitaba (Sul do Brasil). *Acta Biol. Paranaense* **19**: 51-63.
dos Anjos, L. (2001). Bird communities in five Atlantic forest fragments in southern Brazil. *Orn. Neotropical* **12**: 11-27.
dos Anjos, L. & Schuchmann, K.L. (1997). Biogeographical affinities of the avifauna of the Tibagi River Basin, Paraná drainage system, southern Brazil. *Ecotropica* **3(1)**: 43-65.
dos Anjos, L., Schuchmann, K.L. & Berndt, R. (1997). Avifaunal composition, species richness, and status in the Tibagi River Basin, Paraná State, southern Brazil. *Orn. Neotropical* **8(2)**: 145-173.
Annezo, J.P. (1990). Le Cochevis huppé *Galerida cristata* en Bretagne: une population marginalisée. *Ar Vran* **1**: 14-21, 43-75.
Anon. (1966). Mobbing. *Witwatersrand Bird Club News* **55**: 13.
Anon. (1979). Multiple broods in the Cape Wagtail. *Bee-eater* **30(4)**: 26.
Anon. (1983). *Field Guide to the Birds of North America*. National Geographic Society, Washington, D.C.
Anon. (1985). *Proceedings of the Third East-Asian Bird Protection Conference, Tokyo, Japan. 29-31 May 1985*. Wild Bird Society of Japan, Tokyo.
Anon. (1986). Breeding records. *Babbler* **11**: 42-50.
Anon. (1991). *Resúmenes del IV Congreso de Ornitología Neotropical*. CECIA, Quito.
Anon. (1992). *Protected Areas of the World: a Review of National Systems*. Vol. 4. Nearctic and Neotropical. World Conservation Monitoring Centre, IUCN, Gland, Switzerland & Cambridge. 460 pp.
Anon. (1993). *Common Birds of Zambia*. Zambian Ornithological Society, Lusaka, Zambia.
Anon. (1994). Taxonomic round-up. Taxonomic revision of the Greater Antillean Pewee. *Cotinga* **1**: 12.
Anon. (1995a). World news. *Birding World* **8(8)**: 312.
Anon. (1995b). World round-up. New species reinforce priorities. *World Birdwatch* **17(3)**: 5.
Anon. (1995c). *Migratory Nongame Birds of Management Concern in the Continental United States: the 1995 List*. Office of Migratory Bird Management, US Fish & Wildlife Service, Washington, D.C.
Anon. (1996a). Outlook blue for threatened swallows. *Kenya Birds* **5**: 3.
Anon. (1996b). Moves to help Blue Swallows. *Afr. Wildl.* **50**: 29.
Anon. (1996c). Bahama Swallow Conservation Program. *Pitirre* **9(1)**: 18.
Anon. (1996d). Archer's Lark found in Ethiopia. *Bull. African Bird Club* **3**: 75.
Anon. (1996e). *Anais V Congresso Brasileiro de Ornitologia*. Universidade de Campinas, Campinas, Brazil.
Anon. (1997a). Taxonomic round-up. A new manakin from Brazil. *Cotinga* **8**: 14.
Anon. (1997b). World round-up. In brief. *World Birdwatch* **19(4)**: 3.
Anon. (1997c). Neotropical News. Brazil. Threat to Alagoas Reserve. *Cotinga* **8**: 10.
Anon. (1997d). Africa round-up. Barlow's Lark - a new endemic species in southern Africa. *Bull. African Bird Club* **4(2)**: 66.
Anon. (1997e). The Longtailed Pipit: a new species for southern Africa. *Afr. Wildl.* **51(3)**: 44.
Anon. (1997f). In brief. *World Birdwatch* **19(2)**: 3.
Anon. (1997g). World news. *Birding World* **10(8)**: 305.
Anon. (1998a). *The A.O.U. Check-list of North American Birds*. 7th edition. American Ornithologists' Union, Washington, D.C.
Anon. (1998b). *North American Ornithological Conference, 6-12 April 1998, St. Louis, Missouri*. Committee of Local Arrangements, American Ornithologists' Union, Washington, D.C.
Anon. (1998c). Recent reports. *Bee-eater* **49**: 35-36.
Anon. (1998d). *Bird Migration Studies in India 1980-1992. Final Report*. Bombay Natural History Society, Mumbai, India.
Anon. (1999a). *Canadian Species at Risk, April 1999*. Committee on the Status of Endangered Wildlife in Canada, Ottawa.
Anon. (1999b). *Açoes Prioritárias para a Conservaçao da Biodiversidade do Cerrado e Pantanal*. Conservation International, Savassi, Brazil.
Anon. (1999c). Africa round-up. Barlow's Lark, a new endemic species, formally described and considered threatened. *Bull. African Bird Club* **6(1)**: 6.
Anon. (2000a). La Terrera Marismeña de Tenerife se extingue. *Garcilla* **109**: 32.
Anon. (2000b). World round-up. News from the Brazil Atlantic Forest Programme. *World Birdwatch* **22(4)**: 6.
Anon. (2000c). In brief. *World Birdwatch* **22(4)**: 5.
Anon. (2000d). [*Studies on Chinese Ornithology. Proceedings of the 4th Ornithological Symposium of Mainland & Taiwan, China*]. China Forestry Publising House, Beijing. In Chinese with English summary.
Anon. (2001a). Plantcutters imperiled. *Winging It* **13(10)**: 6-7.
Anon. (2001b). World round-up. New piha from Colombia. *World Birdwatch* **21(4)**: 3.
Anon. (2001c). World news. *Birding World* **14(6)**: 251.
Anon. (2001d). La Terrera Marismeña endémica de Tenerife a un paso de su extinción. *Garcilla* **111**: 30.
Anon. (2001e). A punto de perder a la Terrera Marismeña. *Biológica* **58**: 11.
Anon. (2001f). World round-up. New flycatcher from Peru. *World Birdwatch* **23(3)**: 3.
Anon. (2001g). In brief. *World Birdwatch* **23(3)**: 7.
Anon. (2001h). World round-up. New species named in honour of Sam Veasna. *World Birdwatch* **23(4)**: 2.
Anon. (2002a). *Proceedings of the XXIII International Ornithological Congress, Beijing, China, August 11-17, 2002. Abstract Volume*. Beijing.
Anon. (2002b). Neotropical News. Brazil. Murici protected. *Cotinga* **17**: 9.
Anon. (2002c). World round-up. The number of singing male Noisy Scrub-birds. *World Birdwatch* **24(4)**: 5.
Anon. (2002d). World round-up. A new southern African endemic. *World Birdwatch* **24(4)**: 2.
Anon. (2002e). World News. *Birding World* **15(4)**: 173.
Anon. (2002f). *Field Guide to the Birds of North America*. 4th edition. National Geographic Society, Washington, D.C.
Anon. (2003a). Raso Lark in search of sexual equality. *British Birds* **96**: 50.
Anon. (2003b). Horned Lark *Eremophila alpestris peregrina* in Colombia. La Alondra *Eremophila alpestris peregrina* en Colombia. *Cotinga* **20**: 8-9.
Anon. (2003c). World round-up. Raso Lark numbers drop. *World Birdwatch* **25(4)**: 5.
Anon. (2003d). In brief. *World Birdwatch* **25(1)**: 5.
Anon. (2003e). World round-up. Key decision for Brazil's threatened birds. *World Birdwatch* **25(2)**: 2.
Anon. (2003f). World round-up. BirdLife buys Atlantic forest block. *World Birdwatch* **25(2)**: 5.
Anon. (2003g). *BirdLife's Online World Bird Database: the Site for Bird Conservation*. Version 2.0. BirdLife International, Cambridge, UK.
Anon. (2003h). *Alectrurus tricolor*. In: Anon. (2003). *IUCN Red List of Threatened Species*. IUCN, Gland, Switzerland & Cambridge, UK.
Anon. (2004). Was this the first British Black Lark? *Birdwatch* **143**: 7.
Antas, P.T.Z., Azevedo-Júnior, S.M. & Fillipini, A. (1990). Aves endêmicas anilhadas no arquipélago de Fernando de Noronha de 1987 e 1988. Pp. 35-43 in: *Anais IV Econtro Nacional de Anilhadores de Aves*. Universidade Federal Rural de Pernambuco, Pernambuco.
Anthony, D. (1997). The avifauna of the Pitons in St. Lucia. *Pitirre* **10(3)**: 102. (Abstract).
Anthony, L.W. & Ely, C.A. (1976). Breeding biology of Barn Swallows in west-central Kansas. *Kansas Orn. Soc. Bull.* **27**: 37-43.
Antón, C. (1984). *La Población de Avión Común* Delichon urbica *de la Ciudad de Madrid*. Bsc thesis, Universidad Complutense, Madrid.
Apa, A.D., Uresk, D.W. & Linder, R.L. (1991). Impacts of black-tailed prairie dog rodenticides on nontarget passerines. *Great Basin Nat.* **51**: 301-309
Aragüés, A. & Herranz, A. (1983). Dupont's Lark in the Spanish steppes. *British Birds* **76(2)**: 57-62.
Arango, S. (1990). *Aspectos Morfológicos y de Comportamiento de las Aves Frugívoras y su Efectividad como Dispersoras de Semillas en la Reserva Biológica de Carpanta (Cundinamarca, Colombia)*. Bsc thesis, Pontificia Universidad Javeriana, Bogotá.
Aravena, R.O. (1928). Notas sobre la alimentación de las aves. *Hornero* **4**: 38-49, 153-166.
Araya, B. & Chester, S. (1993). *The Birds of Chile. A Field Guide*. LATOUR, Santiago.
Araya, B. & Millie, G. (1986). *Guía de Campo de las Aves de Chile*. Editorial Universitaria, Santiago.
Arballo, E. (1990). Nuevos registros para la avifauna uruguaya. *Hornero* **13**: 179-187.
Archer, G.F. & Godman, E.M. (1937-1961). *The Birds of British Somaliland and the Gulf of Aden*. Vols. 1-2. Gurney & Jackson, London. Vols. 3-4. Oliver & Boyd, Edinburgh & London.
Archipenko, E.V., Panov, E.N. & Rasnicyn, A.P. (1968). [Comparative analysis of the trophic relations of co-existing *Delichon urbica urbica* and *Hirundo rustica rustica*]. *Probl. Evol. Tl Nov., "Nauka"* **1**: 208-211. In Russian.
Arctander, P., Folmer, O. & Fjeldså, J. (1996). The phylogenetic relationships of Berthelot's Pipit *Anthus berthelotii* illustrated by DNA sequence data with remarks on the genetic distance between Rock and Water Pipits *Anthus spinoletta*. *Ibis* **138(2)**: 263-272.
Arendt, W.J. (1992). Status of North American migrant landbirds in the Caribbean region: a summary. Pp. 143-171 in: Hagan & Johnston (1992).
Armstrong, R.H. (1983). *A New, Expanded Guide to the Birds of Alaska*. Alaska Northwest Publishing Company, Anchorage, Alaska.
Arnade, J. (1981). Yellow-throated Orange-throated Longclaw. *Witwatersrand Bird Club News* **115**: 5.
Arndt, H. (1981). Sonnenbadende Haubenlerche. *Falke* **28(8)**: 274-277.
Arnold, K.A. (1984). *Checklist of the Birds of Texas*. Texas Ornithological Society, Austin, Texas.
Arnold, K.A., Boyd, E.J. & Collins, C.T. (1983). Natal and juvenal plumages of the Blue-and-white Swallow (*Notiochelidon cyanoleuca*). *Auk* **101(1)**: 203-205.
Artukhin, Y.B. (2000). [On the breeding biology of the birds of Kamchatka]. Pp. 26-29 in: Anon. (2000). [*The Biology and Conservation of the Birds of Kamchatka*]. Vol. 2. Russian Academy of Science, Far Eastern Brunch & Kamchatka Institute of Ecology, Moscow. In Russian with English summary.
Arvidsson, B., Askenmo, C. & Neergaard, R. (1997). Food supply for settling male Rock Pipits affects territory size. *Anim. Behav.* **54(1)**: 67-72.
Asbirk, S. (1976). Studies on the breeding biology of the Sand Martin *Riparia riparia* (L.) (Aves) in artificial nest sites. *Vidensk. Medd. Dan. Naturhist. Foren.* **139**: 147-177.
Asensio, B. (1998). En lista roja: Alondra de Dupont. *Biológica* **16**: 58-59.
Ash, J.S. (1951). Domed nest of Wood-lark. *British Birds* **44**: 202.
Ash, J.S. (1962). Calandra Lark in Dorset. *British Birds* **55**: 44-46.
Ash, J.S. (1969). Spring weights of trans-Saharan migrants in Morocco. *Ibis* **111(1)**: 1-10.
Ash, J.S. (1981). Field description of the Obbia Lark *Calandrella obbiensis*, its breeding and distribution. *Bull. Brit. Orn. Club* **101(4)**: 379-383.
Ash, J.S. (1990). Additions to the avifauna of Nigeria, with notes on distributional changes and breeding. *Malimbus* **11**: 104-116.
Ash, J.S. (1992a). Dark-plumaged House Martins *Delichon urbica* in northeastern Siberia. *Bull. Brit. Orn. Club* **112(1)**: 53-55.
Ash, J.S. (1992b). Northern White-tailed Bush Lark *Mirafra albicauda*. Singing Bush Lark *M. cantillans* and Friedmann's Bush Lark *M. pulpa* in Ethiopia. *Bull. Brit. Orn. Club* **112(4)**: 247-250.
Ash, J.S. & Gullick, T.M. (1989). The present situation regarding the endemic breeding birds of Ethiopia. *Scopus* **13**: 90-96.
Ash, J.S. & Gullick, T.M. (1990). Field observations on the Degodi Lark *Mirafra degodiensis*. *Bull. Brit. Orn. Club* **110(2)**: 90-93.
Ash, J.S. & Miskell, J.E. (1990). Presumed breeding of Tawny Pipits *Anthus campestris* in the Afrotropics. *Bull. Brit. Orn. Club* **110(4)**: 222-225.
Ash, J.S. & Miskell, J.E. (1998). *Birds of Somalia*. Pica Press, Nr. Robertsbridge, UK.
Ash, J.S. & Olson, S.L. (1985). A second specimen of *Mirafra* (Heteromirafra) *sidamoensis* Érard. *Bull. Brit. Orn. Club* **105(4)**: 141-143.
Ash, J.S. & Sharland, R.E. (1986). *Nigeria Assessment of Bird Conservation Priorities*. ICBP Study Report **11**. ICBP & Nigerian Conservation Foundation, Cambridge.
Ash, J.S., Dowsett, R.J. & Dowsett-Lemaire, F. (1989). New ornithological distribution records from eastern Nigeria. *Tauraco Res. Rep.* **1**: 13-27.
Ash, J.S., Dowsett, R.J. & Dowsett-Lemaire, F. (1991). Additions to the East African avifauna. *Scopus* **14**: 73-75.
Ash, J.S., Ferguson-Lees, I.J. & Fry, C.H. (1967). B.O.U. expedition to Lake Chad, northern Nigeria, March-April 1967. *Ibis* **109(3)**: 478-486.

Ashford, R.W. (1968). Preuss's Cliff Swallow *Lecythoplastes preussi* breeding in western Nigeria. *Bull. Niger. Orn. Soc.* **5**: 42-44.
Ashton, C.B. (1986). Welcome Swallow breeding in a Fairy Martin nest. *Austr. Bird Watcher* **11(6)**: 210-211.
Ashton, D.H. & Bassett, O.D. (1997). The effects of foraging by the Superb Lyrebird (*Menura novae-hollandiae*) in *Eucalyptus regnans* forest at Beenak, Victoria. *Austr. J. Ecol.* **22**: 383-394.
Ashton, J.C. (2000). Welcome Swallow (*Hirundo tahitica*) nesting in Hawke's Bay and adapting to a variable food supply. *Notornis* **47**: 172.
Ashton, J.C. & Armstrong, D.P. (2002). Facultative prioritization of wing growth in the Welcome Swallow *Hirundo neoxena*. *Ibis* **144(3)**: 470-477.
Askenmo, C. & Unger, U. (1986). How to be double-brooded: trends and timing of breeding performance in the Rock Pipit. *Ornis Scand.* **17(3)**: 237-244.
Askenmo, C., Neergaard, R. & Arvidsson, B.L. (1992). Pre-laying time budgets in Rock Pipits: priority rules of males and females. *Anim. Behav.* **44(5)**: 957-965.
Askenmo, C., Neergaard, R. & Arvidsson, B.L. (1994). Food supplementation does not affect territory size in Rock Pipits. *Anim. Behav.* **47(5)**: 1235-1237.
Askins, R.A., Lynch, J.F. & Greenberg, R. (1990). Population declines in migratory birds in eastern North America. *Curr. Orn.* **7**: 1–57.
Aspinall, S. (1996). *Status and Conservation of the Breeding Birds of the United Arab Emirates*. National Avian Research Center, Abu Dhabi.
Aspinwall, D.R. (1972). Greater Striped Swallow records from southern Zambia. *Bull. Zambian Orn. Soc.* **4**: 21.
Aspinwall, D.R. (1973). Sight record of a Bushveld Pipit *Anthus caffer*. *Bull. Zambian Orn. Soc.* **5**: 36.
Aspinwall, D.R. (1976). White-tailed Bush Lark in Gwembe District. *Bull. Zambian Orn. Soc.* **8**: 23-24.
Aspinwall, D.R. (1977a). First records of Fischer's Finchlark *Eremopterix leucopareia* in Zambia. *Bull. Zambian Orn. Soc.* **9**: 21-22.
Aspinwall, D.R. (1977b). Movement analysis charts (Lesser Striped Swallow). *Zambian Orn. Soc. Newsl.* **7**: 78-79.
Aspinwall, D.R. (1979a). Bird notes from Zambesi District, NW Province. *Zambian Orn. Soc. Occas. Pap.* **2**: 1-61.
Aspinwall, D.R. (1979b). Comments on White-throated Swallow (October 1976 - September 1978). *Zambian Orn. Soc. Newsl.* **9**: 72-74.
Aspinwall, D.R. (1979c). Comments on Pearl-breasted Swallow (October 1976 - September 1978). *Zambian Orn. Soc. Newsl.* **9**: 168-169
Aspinwall, D.R. (1980a). Comments on Grey-rumped Swallow (October 1976 - September 1978). *Zambian Orn. Soc. Newsl.* **10**: 59-60.
Aspinwall, D.R. (1980b). Comments on Mosque Swallow (October 1976 - September 1978). *Zambian Orn. Soc. Newsl.* **10**: 130-132.
Aspinwall, D.R. (1980c). Comments on Wire-tailed Swallow (October 1976 - September 1978). *Zambian Orn. Soc. Newsl.* **10**: 147-148.
Aspinwall, D.R. (1980d). Comments on Red-breasted Swallow (October 1976 - September 1978). *Zambian Orn. Soc. Newsl.* **10**: 166-167.
Aspinwall, D.R. (1980e). Further tree nests of the Lesser Striped Swallow *Hirundo abyssinica*. *Bull. Zambian Orn. Soc.* **12(1)**: 32-33.
Aspinwall, D.R. (1981a). Comments on Lesser Striped Swallow (October 1976 - September 1978, January 1979 - January 1981). *Zambian Orn. Soc. Newsl.* **11**: 102-103.
Aspinwall, D.R. (1981b). Comments on African Saw-wing Swallow (October 1976 - September 1978, January 1979 - January 1981). *Zambian Orn. Soc. Newsl.* **11**: 149-150.
Aspinwall, D.R. (1982). Comments on Angola Swallow. *Zambian Orn. Soc. Newsl.* **12**: 118-120.
Aspinwall, D.R. (1983). Movement analysis charts. Comments on Banded Sand Martin. *Zambian Orn. Soc. Newsl.* **13**: 55-56.
Aspinwall, D.R. (1990). The Bushveld (or Little Tawny) Pipit *Anthus caffer* in Zambia. *Zambian Orn. Soc. Newsl.* **20**: 58-61.
Aspinwall, D.R. & Beel, C. (1998). *A Field Guide to Zambian Birds not Found in Southern Africa*. Zambian Ornithological Society, Lusaka.
Aspinwall, D.R. & Tucker, J.J. (1971). Records of a Bushveld Pipit *Anthus caffer*. *Bull. Zambian Orn. Soc.* **3**: 18.
Aspiroz, A.B. (2001). *Aves del Uruguay: Lista e Introducción a su Biología y Conservación*. Graphis Editorial, Uruguay.
Atkins, J.D. (1988). Dark Plain-backed Pipit, *Anthus leucophrys*, at Chileka Dambo. *Nyala* **12(1/2)**: 76-77.
Atkins, J.D. & Harvey, W.G. (1994). Further sightings of an unnamed Cliff Swallow *Hirundo* sp. in Ethiopia. *Scopus* **18**: 52-54.
Atkins, J.D. & Johnston-Stewart, N.G.B. (1989). Buffy Plain-backed Pipits at Lake Chilwa. *Nyala* **14(2)**: 127-128.
Atkinson, I.A.E. (1985). The spread of commensal species of *Rattus* to oceanic islands and their effects on island avifaunas. Pp. 35-81 in: Moors, P.J. ed. (1985). *Conservation of Island Birds. Case Studies for the Management of Threatened Island Species*. ICBP Technical Publication **3**. Cambridge.
Atkinson, P. (1997). Africa round-up. Long-tailed Pipit - a new species of pipit in southern Africa. *Bull. African Bird Club* **4(2)**: 66.
Aubin, T. (1982). Habituation au chant territorial chez l'Alouette des champs (*Alauda arvensis* L.). Rôle de la diversité et de la monotonie. *Biol. Behav.* **7(4)**: 353-362.
Aubin, T. & Bremond, J.C. (1983). The process of species-specific song recognition in the Skylark *Alauda arvensis*. An experimental study by means of synthesis. *Z. Tierpsychol.* **61(2)**: 141-152.
Austin, O.L. (1948). *The Birds of Korea*. Bulletin of the Museum of Comparative Zoology **101**. Cambridge, Massachusetts. 301 pp.
Austin, O.L. & Kuroda, N. (1953). *The Birds of Japan. Their Status and Distribution*. Bulletin of the Museum of Comparative Zoology **109**. Cambridge, Massachusetts. 361 pp.
Austin, O.L. & Low, S.H. (1932). Notes on the breeding of the Tree Swallow. *Bird-Banding* **3**: 39-44.
Aveledo, R. (1986). *Phelpsia* un nuevo género de aves dedicado a la familia Phelps. *Bol. Soc. Venez. Cienc. Nat.* **40**: 11-14.
Aveledo, R. & Pérez, L.A. (1994). Descripción de nueve subespecies nuevas y comentarios sobre dos especies de aves de Venezuela. *Bol. Soc. Venez. Cienc. Nat.* **44(148)**: 229-257.
Aveledo, R. & Pons, A. (1952). Aves nuevas y extensiones de distribución a Venezuela. *Nov. Cient. Contrib. Ocas. Mus. Nat. La Salle* **7**: 1-23.
Averin, V. & Ganya, I.M. (1970). *Ptitsy Moldavii*. Kishinev, Moldova.
Aversa, T. & Vallely, A.C. (1999). A nest of the Scarlet-breasted Fruiteater *Pipreola frontalis* in eastern Ecuador. *Cotinga* **12**: 70.
Aymí, R. (1999). Identification of adult male Yellow Wagtails in winter plumage in western Europe. *Dutch Birding* **21(5)**: 241-253.
de Azevedo, S.M., Dias, M.M., Larrazabal, M.E., Lyra-Neves, R.M. & Telino, W.R. (2000). Movimentação de *Progne chalybea* (Aves: Hirundinidae) em Pernambuco, Brasil. Pp. 149-159 in: Alves *et al.* (2000).
Babarskas, M., Haene, E. & Pereira, J. (2003). Aves de la Reserva Natural Otamendi. Pp. 47-114 in: Haene, E. & Pereira, J. eds. (2003). *Fauna de Otamendi: Inventario de los Animales Vertebrados de la Reserva Natural Otamendi, Campana, Buenos Aires, Argentina*. Temas de Naturaleza y Conservación **3**, Aves Argentinas/Asociación Ornitológica del Plata, Buenos Aires.
Babarskas, M., Veiga, J.O. & Filiberto, F.C. (1995). *Inventario de Aves del Parque Nacional El Rey, Salta, Argentina*. Monografía Especial **6**. Literature of Latin America, Buenos Aires.
Backhurst, G.C. & Pearson, D.J. (1977). Ethiopian region birds attracted to the lights of Ngulia Safari Lodge, Kenya. *Scopus* **1(4)**: 98-103.
Badyaev, A.V. & Hendricks, P. (2001). Wagtails and pipits. Pp. 479-484 in: Elphick, C., Dunning, J.B. & Sibley, D. eds. (2001). *The Sibley Guide to Birds Life & Behaviour*. Christopher Helm, London.
Badyaev, A.V., Kessel, B. & Gibson, D.D. (1996). White Wagtail (*Motacilla alba*). Black-backed Wagtail (*Motacilla lugens*). Nos. **236-237** in: Poole, A. & Gill, F. eds. (1996). *The Birds of North America*. Vol. 6. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Badyaev, A.V., Kessel, B. & Gibson, D.D. (1998). Yellow Wagtail (*Motacilla flava*). No. **382** in: Poole, A. & Gill, F. eds. (1998). *The Birds of North America* Vol. 10. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Baepler, D.H. (1962). The avifauna of the Soloma region in Huehuetenango, Guatemala. *Condor* **64(2)**: 140-153.
Baez, S., Fjeldså, J., Krabbe, N., Morales, P., Navarrete, H., Poulsen, B.O., Resl, R., Schjellerup, I., Skov, F., Ståhl, B. & Øllgaard, B. (1997). *Oyacachi – People and Biodiversity*. DIVA Technical Report **2**. Center for Research on Cultural and Biological Diversity of Andean Rainforests, Rønde, Denmark.
Baglieri, S. & Iapichino, C. (1979). Prima comparsa di Calandra Asiatica (*Melanocorypha bimaculata* (Ménétr.)) in Sicilia (Aves, Passeriformes). *Nat. Sicil.* **3(1-2)**: 17-21.
Baha-El-Din, S.M. (1990). Dunn's Lark breeding in Egypt. *Sandgrouse* **25**: 27-28.
Bahus, T.K. (1993). Clutch size variation of the Meadow Pipit *Anthus pratensis* in relation to altitude and latitude. *Fauna Norvegica (Ser. C, Cinclus)* **16(1)**: 37-40. In English with Norweigan summary.
Baicich, P.J. & Harrison, C.J.O. (1997). *A Guide to the Nests, Eggs, and Nestlings of North American Birds*. Academic Press, San Diego, California.
Baicich, P.J., Heinl, S.C. & Toochin, M. (1996). First documented breeding of the Eurasian Skylark in Alaska. *Western Birds* **27(2)**: 86-88.
Bailey, A.M. & Niedrach, R.J. (1965). *Birds of Colorado*. Denver Museum of Natural History, Denver, Colorado.
Bailey, A.M. & Sorensen, J.H. (1962). *Subantarctic Campbell Island*. Denver Museum of Natural History Proceedings **10**. Denver, Colorado. 305 pp.
Bailey, F.M. (1928). *The Birds of New Mexico*. New Mexico Department of Fish and Game, Santa Fe, New Mexico.
Bailey, S.F. (1983). Western Flycatcher *Empidonax difficilis*. Pp. 268–269 in: Farrand, J. ed. (1983). *The Audubon Society Master Guide to Birding*. Vol. 2. Gulls to Dippers. Alfred A. Knopf, New York.
Baker, A.J. (1991). A review of New Zealand ornithology. *Curr. Orn.* **8**: 1-67.
Baker, H.R. & Inglis, C.M. (1930). *Birds of Southern India*. Government Press, Madras.
Baker, J.K. (1962). Associations of Cave Swallows with Cliff and Barn Swallows. *Condor* **64(4)**: 326.
Balança, G. (1996). Notes sur la nidification de quatre espèces d'oiseaux en Mauritanie. *Malimbus* **18(2)**: 151-153.
Balat, F. (1974). Gelegegröße, Höhe der Brutverluste und Bruterfolg bei der Mehlschwalbe. *Zool. Listy.* **23**: 343-356.
Balat, F. & González, H. (1982). Concrete data on the nesting of Cuban birds. *Acta Sci. Nat. Brno.* **16**: 1-46.
Balatsky, N.N. (1985). [The eggs colouration of *Anthus trivialis* L. and diagnostic importance of this characteristic]. *Biologicheskie Nauki* **7**: 44-47. In Russian with English summary.
Balchin, C.S. & Toyne, E.P. (1998). The avifauna and conservation status of the Río Nangaritza Valley, southern Ecuador. *Bird Conserv. Int.* **8(3)**: 237-253.
Balda, R.P. (1970). Effects of spring leaf-fall on composition and density of breeding birds in tow southern Arizona woodlands. *Condor* **72(3)**: 325-331.
Baldaccinni, N.E., Frugis, S. & Mongini, E. (1984). Homing experiments on the Sand Martin (*Riparia riparia* L.). *Monitore Zool. Ital. (New Ser.)* **18**: 158-159.
Baldaccinni, N.E., Frugis, S. & Mongini, E. (1986). Initial orientation and homing in the Sand Martin *Riparia riparia* (L.) (Aves, Hirundinidae). *Monitore Zool. Ital. (New Ser.)* **20**: 425-439.
Baldaccinni, N.E., Giunchi, D. & Mongini, E. (1999). A long term study on initial orientation in Sand Martins (*Riparia riparia*). *Behaviour* **136**: 1311-1323.
Baldwin, M. (1965). Birds eating charcoal. *Emu* **64**: 208.
van Balen, S. (1999). *Birds on Fragmented Islands. Persistence in the Forests of Java and Bali*. PhD thesis, Wageningen University, Wageningen, Netherlands.
Ball, G.F. (1982). Barn Swallow fledgling successfully elicits feeding at a non-parental nest. *Wilson Bull.* **94(3)**: 362-363.
Ball, G.F. (1983). Functional incubation in male Barn Swallows. *Auk* **100(4)**: 998-1000.
Ball, V. (1874). On the avifauna of Chutia (Chota) Nagpur Division, SW frontier of Bengal. *Stray Feathers* **2**: 355-440.
Ball, V. (1878). From the Ganges to the Godaveri. On the distribution of birds, so far as it is at present known, throughout the hilly region which extends from the Rajmehal Hills to the Godaveri Valley. *Stray Feathers* **7**: 191–235.
Ballman, P. (1972). Les oiseaux miocènes de Vieux-Collonges. *Docum. Lab. Géol. Lyon* **50**: 93-101.
Banbura, J. (1992). Mate choice by females of the Swallow *Hirundo rustica*: is it repeatable? *J. Orn.* **133**: 125-132.
Banbura, J. & Zielinski, P. (1995a). A clear case of sexually selected infanticide in the Swallow *Hirundo rustica*. *J. Orn.* **136**: 299-301.
Banbura, J. & Zielinski, P. (1995b). The influence of laying sequence and ambient temperature on egg size variation in the Swallow *Hirundo rustica*. *J. Orn.* **136(4)**: 453-460.
Banbura, J. & Zielinski, P. (1995c). The onset of incubation and hatching asynchrony in the Barn Swallow *Hirundo rustica*. *Ornis Fenn.* **72**: 174-176.
Banbura, J. & Zielinski, P. (1998a). Timing of breeding, clutch size and double-broodedness in Barn Swallows *Hirundo rustica*. *Ornis Fenn.* **75**: 177-183.
Banbura, J. & Zielinski, P. (1998b). An analysis of egg-size repeatability in Barn Swallows *Hirundo rustica*. *Ardeola* **45(2)**: 183-192.
Banbura, J. & Zielinski, P. (2000). Repeatability of reproductive traits in female Barn Swallows *Hirundo rustica*. *Ardea* **88**: 75-80.
Bangs, O. (1898). Some new races of birds from eastern North America. *Auk* **15**: 173-183.
Bangs, O. (1899). On the subspecies of *Manacus manacus* (Linn.). *Proc. New England Zool. Club* **1**: 33-37.
Bangs, O. (1903). Birds and mammals from Honduras. *Bull. Mus. Comp. Zool.* **39(6)**: 139-160.
Bangs, O. (1914). The Bahama Swallow in Cuba. *Auk* **31(3)**: 401.
Bangs, O. (1916). *A Collection of Birds from the Cayman Islands*. Bulletin of the Museum of Comparative Zoology **60(7)**. Cambridge, Massachusetts. 98 pp.
Bangs, O. (1918). Vertebrata from Madagascar. Aves. *Bull. Mus. Comp. Zool.* **61**: 489-511.
Bangs, O. & Kennard, K.H. (1920). A list of the birds of Jamaica. Pp. 684-701 in: Cundall, F. ed. (1920). *The Handbook of Jamaica*. Government Printing Office, Kingston.
Bangs, O. & Penard, T.E. (1918). Notes on a collection of Surinam birds. *Bull. Mus. Comp. Zool.* **62**: 25-93.
Bangs, O. & Penard, T.E. (1921). Notes on some American birds, chiefly Neotropical. *Bull. Mus. Comp. Zool.* **64**: 365-397.
Bangs, O. & Peters, J.L. (1928). A collection of birds from Oaxaca. *Bull. Mus. Comp. Zool.* **68**: 385-404.
Bangs, O. & Van Tyne, J. (1931). *Birds of the Kelley-Roosevelts Expedition to French Indo-China*. Publications of the Field Museum of Natural History (Zoological Series) **290, pt. 18(3)**. 86 pp.
Banks, R.C. (1997). The name of Lawrence's Flycatcher. Pp. 21-24 in: Dickerman (1997).
Banks, R.C. (2000). The Cuban Martin in Florida. *Florida Field Nat.* **28(2)**: 50-52.
Bannerman, D.A. (1939). *The Birds of Tropical West Africa*. Vol. 2. Oliver & Boyd, Edinburgh.
Bannerman, D.A. (1951). *The Birds of Tropical West Africa*. Vol. 8. The Crown Agents for the Colonies, London.
Bannerman, D.A. (1953). *The Birds of West and Equatorial Africa*. Vols. 1-2. Oliver & Boyd, Edinburgh.
Bannerman, D.A. (1963). *Birds of the Atlantic Islands*. Vol. 1. Oliver & Boyd, Edinburgh & London.
Bannerman, D.A. & Bannerman, W.M. (1958). *Birds of Cyprus*. Oliver & Boyd, Edinburgh.
Bannerman, D.A. & Bannerman, W.M. (1965). *Birds of the Atlantic Islands*. Vol. 2. Oliver & Boyd, Edinburgh & London.
Bannerman, D.A. & Bannerman, W.M. (1968). *History of the Birds of the Cape Verde Islands*. Oliver & Boyd, Edinburgh.
Bannerman, D.A. & Bates, G.L. (1926). On some birds of Adamawa and New Cameroon: an answer to some criticisms and remarks on new forms recently described by Dr. Hermann Grote. *Ibis* **Ser. 12, no. 2**: 783-802.
Bannon, P. (1999). First Quebec records of Cave Swallows. *Birders J.* **8**: 301-304.
Baptista, L.F. (1996). Nature and its nurturing in avian vocal development. Pp. 39-60 in: Kroodsma & Miller (1996).
Barber, C.A. & Robertson, R.J. (1998). Homing ability of breeding male Tree Swallows. *J. Field Orn.* **69(3)**: 444-449.
Barber, C.A. & Robertson, R.J. (1999). Floater males engage in extrapair copulations with resident female Tree Swallows. *Auk* **116(1)**: 264-269.
Barber, C.A., Robertson, R.J. & Boag, P.T. (1996). The high frequency of extra pair paternity in Tree Swallows is not an artifact of nestboxes. *Behav. Ecol. Sociobiol.* **38**: 425-430.
Barber, C.A., Robertson, R.J. & Boag, P.T. (1998). Experimental mate replacement does not increase extra-pair paternity in Tree Swallows. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **265**: 2187-2190.
Barbier, L. (2001). Elements for a Skylark (*Alauda arvensis*) management plan. *Game & Wildl. Sci.* **18(1)**: 45-83.
Barbosa, A. (1999). Tail streamers and flight performance in Barn Swallows: natural or sexual selection? *Ardeola* **46(1)**: 101-104.
Barbosa, A. & Møller, A.P. (1999a). Sexual selection and tail streamers in the Barn Swallow: appropriate tests of the function of size-dimorphic long tails. *Behav. Ecol.* **10**: 112-114.
Barbosa, A. & Møller, A.P. (1999b). Aerodynamic costs of long tails in male Barn Swallows *Hirundo rustica* and the evolution of sexual size dimorphism. *Behav. Ecol.* **10**: 128-135.
Barbosa, A., Merino, S., de Lope, F. & Møller, A.P. (2002). Effects of feather lice on the flight behavior of male Barn Swallows (*Hirundo rustica*). *Auk* **119(1)**: 213-216.
Barbour, T. (1923). *The Birds of Cuba*. Memoirs of the Nuttall Ornithological Club **6**. Cambridge, Massachusetts. 141 pp.
Barbour, T. (1943). *Cuban Ornithology*. Memoirs of the Nuttall Ornithological Club **9**, Cambridge, Massachusetts. 144 pp.
Barclay, R.M.R. (1988). Variation in the costs, benefits, and frequency of nest reuse by Barn Swallows (*Hirundo rustica*). *Auk* **105(1)**: 53-60.

Barker, F.K., Barrowclough, G.F. & Groth, J.G. (2001). A phylogenetic hypothesis for passerine birds: taxonomic and biogeographic implications of an analysis of nuclear DNA sequence data. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **269**: 295-308.

Barker, R.D. & Vestjens, W.J.M. (1990). *The Food of Australian Birds*. Vol. 2. Passerines. CSIRO, Melbourne.

Barlow, C., Wacher, T. & Disley, T. (1997). *A Field Guide to the Birds of The Gambia and Senegal*. Pica Press, Nr. Robertsbridge, UK.

Barlow, J.C. & McGillivray, W.B. (1983). Foraging and habitat relationships of the sibling species Willow Flycatcher (*Empidonax traillii*) and Alder Flycatcher (*E. alnorum*) in southern Ontario. *Can. J. Zool.* **61**: 1510-1516.

Barlow, J.C., Klaas, E.E. & Lenz, J.L. (1963). Sunning of Bank Swallows and Cliff Swallows. *Condor* **65(5)**: 438-440.

Barnes, K.N. ed. (2000). *The Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland*. BirdLife South Africa, Johannesburg.

Barnes, R., Butchart, S.H.M., Davies, C.W.N., Fernández, M. & Seddon, N. (1997). New distributional information on eight bird species from northern Peru. *Bull. Brit. Orn. Club* **117(1)**: 69-74.

Barnett, A., Shapley, R., Benjamin, P., Henry, E. & McGarrell, M. (2002). Birds of the Potaro Plateau, with eight species new to Guyana. *Cotinga* **18**: 19-36.

Barone, R. (2002). Mimicry by Lesser Short-toed Lark on Tenerife. *British Birds* **95(4)**: 193.

Barrantes, G. & Pereira, A. (2002). Seed dissemination by frugivorous birds from forest fragments to adjacent pastures on the western slope of Volcán Barva, Costa Rica. *Rev. Biol. Trop.* **50(2)**: 569-575.

Barré, N. (1988). Une avifaune menacée: les oiseaux de la Réunion. Pp. 167-196 in: Thibault & Guyot (1988).

Barré, N. & Barau, C.A. (1982). *Oiseaux de la Réunion*. Imprimerie Arts Graphiques, St-Denis, Réunion.

Barré, N., Barau, A. & Jouanin, C. (1996). *Oiseaux de la Réunion*. Les Éditions du Pacifique, Paris.

Barrentine, C.D. (1980). The ingestion of grit by nestling Barn Swallows. *J. Field Orn.* **51**: 368-371.

Barrio, J. (1997). Photo spot. Tumbes Tyrant *Tumbezia salvini*. *Cotinga* **8**: 87-89.

Barrowclough, G.F., Lentino, R.M. & Sweet, P.R. (1997). New records of birds from Auyán-Tepui, Estado Bolívar, Venezuela. *Bull. Brit. Orn. Club* **117(3)**: 194-198.

Barrows, W.B. (1883). Birds of the lower Uruguay. *Bull. Nuttall Orn. Club* **8(1)**: 82-94, 198-212.

Barry, K.J. (1998). Notes on the nesting of Mosque Swallows. *Honeyguide* **44(4)**: 220-221.

Barthel, P.H. (1990). [Identification of Citrine Wagtail *Motacilla citreola*]. *Limicola* **4(4)**: 149-154, 156-182. In German with English summary.

Bartholomew, G.A., Vleck, C.M. & Bucher, T.L. (1983). Energy metabolism and nocturnal hypothermia in two tropical passerines, *Manacus vitellinus* and *Pipra mentalis*. *Physiol. Zool.* **53(3)**: 370-379.

Barton, I.E. (1947). Occurrence of Tree Martin (*Hylochelidon nigricans*) in Wairarapa. *Notornis* **2(6)**: 131.

Bartrolí, X. (1991). An intermediate population of Italian and Spanish Yellow Wagtails *Motacilla flava cinereocapilla* and *M. f. iberiae* in northeastern Spain. *Ardeola* **38(2)**: 199-205. In English with Spanish summary.

Barua, M. & Sharma, P. (1999). Birds of Kaziranga National Park, India. *Forktail* **15**: 47-60.

Basilio, A. (1963). *Aves de la Isla de Fernando Poo*. Editorial Coculsa, Madrid.

Bassett, O.D. (1987). *The Effect of Lyrebird* (Menura novaehollandiae) *Activity on Soils of a Young* Eucalyptus regnans *Forest, Beenak, Victoria*. BSc thesis, University of Melbourne, Melbourne.

Bates, G.L. (1930). *Handbook of the Birds of West Africa*. John Bale, Sons & Danielson, London.

Bates, G.L. (1934). Birds of the southern Sahara and adjoining countries in French West Africa. Part 4. *Ibis* **Ser. 13, no. 4**: 439-466.

Bates, G.L. (1936). Birds in Jidda and central Arabia collected in 1934 and early in 1935, chiefly by Mr. Philby. *Ibis* **Ser. 13, no. 6**: 531-556, 674-712.

Bates, J.M. & Parker, T.A. (1998). The avifauna of Parque Nacional Noel Kempff Mercado and surrounding areas. Aves del Parque Nacional Noel Kempff Mercado y sus alrededores. Pp. 317-340 in: Killeen, T.J. & Schulenberg, T.S. eds. (1998). *A Biological Assessment of Parque Nacional Noel Kempff Mercado, Bolivia*. Rapid Assessment Program Working Papers **10**. Conservation International, Washington, D.C. In Spanish and English.

Bates, J.M. & Zink, R.M. (1994). Evolution into the Andes: molecular evidence for species relationships in the genus *Leptopogon*. *Auk* **111(3)**: 507-515.

Bates, J.M., Parker, T.A., Capparella, A.P. & Davis, T.J. (1992). Observations on the *campo, cerrado* and forest avifaunas of eastern Dpto. Santa Cruz, Bolivia, including 21 species new to the country. *Bull. Brit. Orn. Club* **112(2)**: 86-98.

Bates, J.M., Stotz, D.F. & Schulenberg, T.S. (1998). Avifauna of Parque Nacional Noel Kempff Mercado. Avifauna del Parque Nacional Noel Kempff Mercado. Pp. 112-128 in: Killeen, T.J. & Schulenberg, T.S. eds. (1998). *A Biological Assessment of Parque Nacional Noel Kempff Mercado, Bolivia*. Rapid Assessment Program Working Papers **10**. Conservation International, Washington, D.C. In Spanish and English.

Bates, R.S.P. & Lowther, E.H.N. (1952). *Breeding Birds of Kashmir*. Oxford University Press, Oxford.

Batten, T.A. (1943). The Rock Martin (*Ptyonoprogne fuligula*). *Ostrich* **13(4)**: 238-239.

Baudrenghien, Y., Schmitz, L. & van der Elst, D. (1989). Première observation d'une Hirondelle de rochers (*Ptyonoprogne rupestris*) en Belgique. *Aves* **26(3&4)**: 226-227.

Bauer, C. & Pacheco, J.F. (2000). Lista das aves da região de Visconde Mauá, Serra da Mantiqueira, no limite dos Estados do Rio de Janeiro e Minas Gerais. *Atualidades Orn.* **97**: 7.

Baumann, C. (1987). Zur Brutbiologie der Haubenlerche *Galerida cristata* in Braunschweig. *Braunschw. Naturkund. Schr.* **2(4)**: 725-750.

Baumgartner, F.M. & Baumgartner, A.M. (1992). *Oklahoma Bird Life*. University of Oklahoma Press, Norman, Oklahoma.

Baxter, J. (1993). The singer in the forest. *Wildl. Austr.* **30(4)**: 2-5.

Bazhanov, V.S. (1928). [*Melanocorypha tatarica* Pall. (Black Lark) as constantly breeding bird in north-western Kazakhstan and adjacent parts of regions in the middle and lower Volga River areas]. *Uragus* **8**: 23-24. In Russian.

Beadnell, C.B. (1936). An albino Nilgiri Pipit *Anthus nilghiriensis* (Sharpe). *J. Bombay Nat. Hist. Soc.* **39(1)**: 174.

Beal, F.E.L. (1907). *Birds of California, in Relation to the Fruit Industry*. US Department of Agriculture Bulletin **30**. 101 pp.

Beal, F.E.L. (1910). Food of our important flycatchers. *Biol. Surv. Bull.* **44**: 1-67.

Beal, F.E.L. (1912). *Food of Our More Important Flycatchers*. US Department of Agriculture, Biological Survey Bulletin **44**. 67 pp.

Beal, F.E.L. (1918). Food habits of the swallows, a family of valuable native birds. *US Dept. Agriculture Bull.* **619**: 1-28.

Beaman, M. & Madge, S. (1998). *The Handbook of Bird Identification for Europe and the Western Palearctic*. Christopher Helm, London.

Beaman, M., Porter, R.F. & Vittery, A. (1975). *Ornithological Society of Turkey Bird Report 1970-73*. Ornithological Society of Turkey, Sandy, UK.

Bear, A. (1991). [Ethiopian Swallow *Hirundo aethiopica*: a new species for Israel and the Palearctic region]. *Torgos* **9(2)**: 41-42. In Hebrew with English summary.

Beasley, A.J. (1995). *The Birds of the Chimanimani Mountains*. Honeyguide **41**(Supplement). 57 pp.

Beasley, B.A. (1996). Males on guard: paternity defences in Violet-green Swallows and Tree Swallows. *Anim. Behav.* **52**: 1211-1224.

Beason, R.C. (1970). *The Annual Cycle of the Prairie Horned Lark in West-central Illinois*. MSc thesis, Western Illinois University, Macomb, Illinois.

Beason, R.C. (1984). Altruism in the Horned Lark *Eremophila alpestris*? *J. Field Orn.* **55(4)**: 489-490.

Beason, R.C. (1995). Horned Lark (*Eremophila alpestris*). No. **195** in: Poole & Gill (1995).

Beason, R.C. & Franks, E.C. (1973). Development of young Horned Larks. *Auk* **90(2)**: 359-363.

Beason, R.C. & Franks, E.C. (1974). Breeding behavior of the Horned Lark. *Auk* **91(1)**: 65-74.

Beatty, H.A. & Danforth, S.T. (1931). Puerto Rican ornithological records. *J. Dept. Agric. Puerto Rico* **15**: 33-106.

Beauchamp, A.J. (1995). The status of the New Zealand Pipit (*Anthus novaeseelandiae*) in the Wellington region. *Notornis* **42(2)**: 117-125.

Beauchamp, A.J. (1998). Density and foraging behaviour of pipits (*Anthus novaeseelandiae chathamensis*) and Skylarks (*Alauda arvensis*) on Chatham Island. *Notornis* **45(2)**: 95-101.

Beauchamp, A.J. (2002). Chatham Island Pipit (*Anthus novaeseelandiae chathamensis*) use of farm and fern land in spring. *Notornis* **49(1)**: 45-48.

Beaud, E., Beaud, P. & Manuel, F. (1992). [Breeding of the Meadow Pipit in the Pays d'Enhaut (Vaud)]. *Nos Oiseaux* **41(5)**: 273-279. In French with German and English summary.

Beaver, D.L. & Baldwin, P.H. (1975). Ecological overlap and the problem of competition and sympatry in the Western and Hammond's Flycatchers. *Condor* **77(1)**: 1-13.

Beavers, R.A., Delaney, D.J., Leahy, C.W. & Oatman, G.F. (1991). New and noteworthy bird records from Petén, Guatemala, including Tikal National Park. *Bull. Brit. Orn. Club* **111(2)**: 77-90.

Becker, C.D. & López, B. (1997). Conservation value of a *Garua* forest in the dry season: a bird survey in Reserva Ecológica de Loma Alta, Ecuador. *Cotinga* **8**: 66-74.

Becker, D., Agreda, A., Richter, A. & Rodríguez, O. (2000). Interesting bird records from the Colonche Hills, western Ecuador. *Cotinga* **13**: 55-58.

Becker, K. (1996). Die Dauer des Feldlerchengesanges. *Orn. Mitt.* **48(12)**: 305-307.

Beebe, W. (1890). Avian migration at Rancho Grande in north central Venezuela. *Ibis* **Ser. 6, no. 2**: 153-168.

Beebe, W. (1924a). *Galapagos: World's End*. Putnam & Witherby, London.

Beebe, W. (1924b). The rarest of nests on the tallest of grass stems. *Bull. N.Y. Zool. Soc.* **27**: 114-117.

Beebe, W., Hartley, G.I. & Howes, P.G. (1917). *Tropical Wild Life in British Guiana*. New York Zoological Society, New York.

Beecher, M.D. & Beecher, I.M. (1979). Sociobiology of Bank Swallows: reproductive strategy of the male. *Science* **205**: 1282-1285.

Beecher, M.D. & Beecher, I.M. (1983). Sibling recognition in Bank Swallows (*Riparia riparia*). *Z. Tierpsychol.* **62**: 145-150.

Beecher, M.D., Beecher, I.M. & Hahn, S. (1981). Parent-offspring recognition in Bank Swallows (*Riparia riparia*). Part II. Development and acoustic basis. *Anim. Behav.* **29**: 95-101.

Beecher, M.D., Beecher, I.M. & Lumpkin, S. (1981). Parent-offspring recognition in Bank Swallows (*Riparia riparia*). Part I. Natural history. *Anim. Behav.* **29**: 86-94.

Beecher, M.D., Medvin, M.B., Stoddard, P.K. & Loesche, P. (1986). Acoustic adaptations for parent-offspring recognition in swallows. *J. Exper. Biol.* **45**: 179-183.

Beecher, M.D., Stoddard, P.K. & Loesche, P. (1985). Recognition of parents' voices by young Cliff Swallows. *Auk* **102(3)**: 600-605.

Beedy, E.C. (1981). Bird communities and forest structure in the Sierra Nevada of California. *Condor* **83(2)**: 97–105.

Beehler, B.M. (1978). *Upland Birds of Northeastern New Guinea*. Wau Ecology Institute Handbook **4**, Wau, Papua New Guinea.

Beehler, B.M., Pratt, T.K. & Zimmerman, D.A. (1986). *Birds of New Guinea*. Princeton University Press, Princeton, New Jersey.

Beel, C. (1992). Cape Wagtail in the Zambezi Valley. *Zambian Orn. Soc. Newsl.* **22(7)**: 78.

Beesley, J.S.S. (1971). Further notes on the Spike-heeled Lark *Chersomanes albifasciata* in East Africa. *Bull. Brit. Orn. Club* **91(1)**: 10-11.

Beesley, J.S.S. (1972). Birds of Arusha National Park. *J. East Afr. Nat. Hist. Soc.* **132**: 1-32.

Beesley, J.S.S. (1973). The breeding seasons of birds in the Arusha National Park, Tanzania. *Bull. Brit. Orn. Club* **93(1)**: 10-20.

Begazo, A.J. (1995). *Resource Partitioning in a Neotropical Bird Community*. University of Florida, Gainesville, Florida.

Begazo, A.J. & Valqui, T. (1998). Birds of Pacaya-Samiria National Reserve with a new population (*Myrmotherula longicauda*) and new record for Peru (*Hylophilus semicinereus*). *Bull. Brit. Orn. Club* **118(3)**: 159-166.

Begazo, A.J., Valqui, T., Sokol, M. & Langlois, E. (2001). Notes on some birds from central and northern Peru. *Cotinga* **15**: 81-87. In English with Spanish summary.

Begg, G.W. (1981). Cape Wagtail eating fiddler crabs. *Ostrich* **52(4)**: 250.

Beheler, A.S. & Rhodes, O.E. (2003). Within-season prevalence of extrapair young in broods of double-brooded and mate faithful Eastern Phoebes (*Sayornis phoebe*) in Indiana. *Auk* **120(4)**: 1054-1061. In English with Spanish summary.

Beheler, A.S., Rhodes, O.E. & Weeks, H.P. (2003). Breeding site and mate fidelity in Eastern Phoebes (*Sayornis phoebe*) in Indiana. *Auk* **120(4)**: 990-999. In English with Spanish summary.

Behle, W.H. (1942). *Distribution and Variation of the Horned Larks* (Otocoris alpestris) *of Western North America*. University of California Publications in Zoology **46**. 112 pp.

Behle, W.H. (1963). Avifaunistic analysis of the Great Basin region of North America. Pp. 1168-1181 in: Sibley (1963).

Behle, W.H. (1976). Systematic review, intergradation, and clinal variation in Cliff Swallows. *Auk* **93(1)**: 66-77.

Behle, W.H. (1985). *Utah Birds: Geographic Distribution and Systematics*. Utah Museum of Natural History, Salt Lake City, Utah.

Belcher, C.F. (1941). Birds of a Kenya Highland District. *Ostrich* **11**: 75-96.

Belcher, C.F. & Smooker, G.D. (1937). Birds of the colony of Trinidad and Tobago. Part V. *Ibis* **Ser. 14, no. 1**: 225-249.

Belenguer, C. & Di Martino, S. (1993). Nidificación del Tuquito Gris (*Empidonomus aurantiatrocristatus*) en el sur de Buenos Aires. *Nuestras Aves* **28**: 26.

Beletsky, L. (1998). *The Ecotravellers' Wildlife Guide to Costa Rica*. Academic Press, London & San Diego.

Beletsky, L. (1999). *The Ecotravellers' Wildlife Guide to Tropical Mexico*. Academic Press, London & San Diego.

Belik, V.P. (1990). Scatch on the biology of the Mongolian Lark (*Melanocorypha mongolica*) in the south eastern part of the area east to the Baikal Lake. *Ornitologiya* **24**: 120-123.

Belik, V.P. (2000). Some peculiarities of a formation of summer larks communities on meadow-steppe landscapes of south-eastern Europe. *Berkut* **9(1-2)**: 86-101.

Bell, B.D. (1968). The Fairy Martin a new bird for New Guinea. *Emu* **68**: 5.

Bell, B.D. (1979). Tree Martins nesting in buildings. *Austr. Bird Watcher* **8**: 102.

Bell, B.D. (1984). The Fairy Martin, *Petrochelidon ariel*, in New Zealand. *Notornis* **31(2)**: 172-173.

Bell, C. (1983). Factors influencing nest-site selection in House Martins. *Bird Study* **30**: 233-237.

Bell, C.P. (1996a). Seasonality and time allocations as causes of leap-frog migration in the Yellow Wagtail *Motacilla flava*. *J. Avian Biol.* **27(4)**: 334-342.

Bell, C.P. (1996b). The relationship between variation in clutch size and migration pattern in the Yellow Wagtail. *Bird Study* **43**: 333-341.

Bell, K. (1976). Song of the Superb Lyrebird in south-eastern New South Wales, with some observations on habitat. *Emu* **76(2)**: 59-63.

Belton, W. (1985). *Birds of Rio Grande do Sul, Brazil*. Part 2. Formicariidae through Corvidae. Bulletin of the American Museum of Natural History **180**, New York. 242 pp.

Beltran, J. (1994). *Hábitos Alimenticios de* Procnias tricarunculata*: un Enfoque Mixto para Evaluar Parámetros que Afectan su Pupel como Dispersor de Semillas*. PhD thesis, Universidad Nacional, Heredia, Costa Rica.

Bemis, C. (1996). *Nest Site Selection and Nesting Success of the Western Wood-Pewee* (Contopus sordidulus) *in the Sacramento Valley, California*. California State University, Sacramento, California.

Bemis, C. & Rising, J.D. (1999). Western Wood-pewee (*Contopus sordidulus*). No. **451** in: Poole & Gill (1999).

Benalcázar, C.E. & Benalcázar, F. (1984). Historia natural del Gallo de Roca Andino (*Rupicola peruviana sanguinolenta*). *Cespedesia* **13**: 59-92.

Bencke, G.A. (1995). The nest of the Grey-headed Flycatcher *Mionectes rufiventris*. *Bull. Brit. Orn. Club* **115(2)**: 105-108.

Bencke, G.A., Kindel, A. & Mähler, J.K.F. (2000). Adições à avifauna de Mata Atlântica do Rio Grande do Sul [Additions to the Atlantic Forest avifauna of Rio Grande do Sul, Brazil]. Pp. 317-323 in: Alves *et al.* (2000). In Portuguese with English summary.

Bencke, G.A., Suertegaray, C., Mähler, J.K.F. & Joenck, C.M. (2001). First description of the nest of the Brown-breasted Pygmy-tyrant (*Hemitriccus obsoletus*) and additional information on the nesting of the Striolated Tit-spinetail (*Lesptasthenura striolata*). *Orn. Neotropical* **12(1)**: 1-9.

Bencke, G.A., Suertegaray, C. & de Mendonça-Lima, A. (2002). Registro de dois novos passeriformes para o Brasil: *Serpophaga griseiceps* (Tyrannidae) e *Asthenes pyrrholeuca* (Furnariidae). *Ararajuba* **10(2)**: 266-269.

Bendire, C.E. (1895). *Life Histories of North American Birds*. From the parrots to the grackles, with special reference to their breeding habits and eggs. US National Museum Special Bulletin **3**. Smithsonian Institution, Washington, D.C.

Benito-Espinal, E. & Hautcastel, P. (1988). Les oiseaux menacés de Guadeloupe et de Martinique. Pp. 37-60 in: Thibault & Guyot (1988).

Bennett, G.F. & Peirce, M.A. (1990). The haemoproteids of the Old World avian families Alaudidae (larks), Irenidae (leaf birds), and Motacillidae (wagtails and pipits). *J. Nat. Hist.* **24**: 939-947.

Bennett, P.M. (1986). *Comparative Studies of Morphology, Life History and Ecology among Birds*. PhD thesis, University of Sussex, Falmer, UK.

Bennett, S.E. (1980). Interspecific competition and the niche of the American Redstart (*Setophaga ruticilla*) in wintering and breeding communities. Pp. 319–335 in: Keast & Morton (1980).

Bennun, L. ed. (1992). *Proceedings of the VII Pan-African Ornithological Congress, Nairobi, 1988*. PAOC, Nairobi.

Bennun, L. (1999). Threatened birds and rural communities: balancing the equation. Pp. 1546-1555 in: Adams & Slotow (1999).

Bennun, L. & Njoroge, P. eds. (1996). Birds to watch in East Africa: a preliminary red data list. *Centre Biodiversity Res. Rep.* **23**: 1-16.

Bennun, L. & Njoroge, P. (1999). *Important Bird Areas in Kenya*. Nature Kenya, Nairobi.

Bennun, L. & Waiyaki, E.M. (1992). *Forest Birds of the Shimba Hills and Malunganji: a Survey*. Ornithology **10**. Research Reports of the Centre for Biodiversity, Nairobi, Kenya.

Bennun, L., Borghesio, L., Biddau, L., Waiyaki, E. & Lens, L. (1997). Distribution and habitat use of Crested Larks *Galerida cristata* at Loiyengalani, Kenya. *Scopus* **19(2)**: 69-72.
Benson, C.W. (1942). A new species and ten new races from southern Abyssinia. *Bull. Brit. Orn. Club* **63(1)**: 8-19.
Benson, C.W. (1944). The Madagascar Martin from Nyasaland. *Bull. Brit. Orn. Club* **65(1)**: 4-5.
Benson, C.W. (1946a). Notes on the birds of southern Abyssinia. *Ibis* **88(1)**: 25-48.
Benson, C.W. (1946b). Notes on the birds of southern Abyssinia. *Ibis* **88(3)**: 287-306.
Benson, C.W. (1949). The systematics and migrations of the Pearl-breasted Swallow. *Ostrich* **29**: 137-145.
Benson, C.W. (1951). Breeding and other notes from Nyasaland and the Lundaza District of northern Rhodesia. *Bull. Mus. Comp. Zool., Harvard* **106**: 69-114.
Benson, C.W. (1953). *A Check-list of the Birds of Nyasaland*. Nyasaland Society, Blantyre, Malawi.
Benson, C.W. (1956). New or unusual records from northern Rhodesia. *Ibis* **98(4)**: 595-605.
Benson, C.W. (1959). The Dusky Lark *Mirafra nigricans* (Sundevall). *Bull. Brit. Orn. Club* **79(7)**: 124-127.
Benson, C.W. (1966). The Spike-heeled Lark *Chersomanes albofasciata* in East Africa. *Bull. Brit. Orn. Club* **86(4)**: 76-77.
Benson, C.W. (1976). A breeding record of the Short-tailed Pipit (*Anthus brachyurus*). *Bull. Zambian Orn. Soc.* **8**: 67.
Benson, C.W. (1980). Man-induced changes in Malawi birds. Pp. 373-381 in: Johnson, D.N. (1980).
Benson, C.W. (1981). Les oiseaux: des espèces uniques au monde. Pp. 63-74 in: Oberlé, P. ed. (1981). *Madagascar, un Sanctuaire de la Nature*. Lechevalier, Paris.
Benson, C.W. (1982). Migrants in the Afrotropical region south of the equator. *Ostrich* **53**: 31-49.
Benson, C.W. & Benson, F.M. (1977). *The Birds of Malawi*. Monfort Press, Limbe.
Benson, C.W. & Forbes-Watson, A.D. (1966). A further note on the Spike-heeled Lark *Chersomanes albofasciata* in East Africa. *Bull. Brit. Orn. Club* **86(9)**: 172-173.
Benson, C.W. & Irwin, M.P.S. (1965). The Grey-backed Sparrow-lark, *Eremopterix verticalis* (Smith). *Arnoldia, Rhodesia* **1(36)**: 1-9.
Benson, C.W. & Pitman, C.R.S. (1957). Some breeding records from northern Rhodesia. *Ool. Rec.* **30**: 7-11, 21-27, 37-43.
Benson, C.W., Brooke, R.K., Dowsett, R.J. & Irwin, M.P.S. (1971). *The Birds of Zambia*. Collins, London.
Benson, C.W., Colebrook-Robjent, J.F.R. & Williams, A. (1976-1977). Contribution à l'ornithologie de Madagascar. *Oiseau et RFO* **46**: 103-134, 209-242, 368-386; **47**: 41-64, 168-191.
Benson, C.W., Irwin, M.P.S. & White, C.M.N. (1959). South African Ornithological Society. Some aspects of speciation in the birds of Rhodesia and Nyasaland. *Ostrich* **3**(Suppl.): 397-414.
Bent, A.C. (1942). *Life Histories of North American Flycatchers, Larks, Swallows and their Allies*. US National Museum Bulletin **179**. Smithsonian Institution, Washington, D.C.
Bent, A.C. (1950). *Life Histories of North American Wagtails, Shrikes, Vireos and their Allies*. US National Museum Bulletin **197**. Smithsonian Institution, Washington, D.C.
Benton, T.G., Bryant, D.M., Cole, L. & Crick, H.Q.P. (2002). Linking agricultural practice to insect and bird populations: a historical study over three decades. *J. Appl. Ecol.* **39**: 673-687.
Benussi, E. (1991). La nidificazione di Rondino Rossiccia nel Carso Triestino ed ulteriori dati sulla distribuzione in Italia e Corsica. *Faune* **2**: 58-61.
Béraut, E. (1970). The nesting of *Gymnoderus foetidus*. *Ibis* **112(2)**: 256.
Beregovoi, V.E. (1971). [Some population characteristics of *Motacilla flava* populations from North and South Urals, upper parts of Irtysh River and Zaissan Lake]. *Zoologischeskii Zhurnal* **49(6)**: 898-902. In Russian with English summary.
Berezovikov, N.N. & Kovshar, A.F. (1994). [The biology of the Calandra Lark (*Melanocorypha calandra* L., 1758) in steppe and semi-desert landscapes of south-east Kazakhstan]. *Selevinia* **2(4)**: 55-58. In Russian.
van den Berg, A.B. (1984). Field identification of Dupont's Lark. *Dutch Birding* **6(3)**: 102-105.
van den Berg, A.B. (1987). Bill shape of Bimaculated Lark in Turkey. *Dutch Birding* **9(4)**: 172–174.
Berg, K.S. (1994). New and interesting records of birds from a dry forest reserve in southwest Ecuador. *Cotinga* **2**: 14-19.
Berg, K.S. (2000). Field notes on the biology of the Long-wattled Umbrellabird *Cephalopterus penduliger* in west Ecuador. *Cotinga* **14**: 26-29.
Berg, K.S. (2002a). Cabezón Pizarroso. *Pachyramphus spodiurus*. Page 175 in: Granizo (2002).
Berg, K.S. (2002b). Mosquero Real Occidental. *Onychorhynchus occidentalis*. Page 305 in: Granizo (2002).
van den Berg, M. (1975). Gedrag en determinatie van de Waterpieper *Anthus spinoletta spinoletta* op zijn Slaapplaats. [Behaviour and identification of the Water Pipit at roosting-place]. *Limosa* **48(3-4)**: 158-162. In Dutch with English summary.
van den Berg, M. & Oreel, G.J. (1985). Field identification and status of Black-headed Yellow Wagtails in western Europe. *British Birds* **78(4)**: 176-183.
Berger, A.J. (1957). Population density of Alder Flycatchers and Common Goldfinches in *Crataegus* habitats of southeastern Michigan. *Wilson Bull.* **69(4)**: 317-322.
Berger, A.J. & Parmalee, D.F. (1952). The Alder Flycatcher in Washtenaw County, Michigan: breeding distribution and cowbird parasitism. *Wilson Bull.* **64(1)**: 33-38.
Bergeron, D., Jones, C., Genter, D.L. & Sullivan, D. (1992). *Skaar's Montana Bird Distribution*. Montana Natural Heritage Program, Helena, Montana.
Bergier, P. & Bergier, F. (1990). *A Birdwatcher's Guide to Morocco*. Prion, Perry, UK.
Bergier, P. & Horner, K.O. (1990). Observations sur l'Alouette-moineau à front blanc *Eremopterix nigriceps* en période de reproduction a Bahrain. *Oiseau et RFO* **60(2)**: 118-135.
Bergin, T.M. (1992). Habitat selection by the Western Kingbird in western Nebraska: a hierarchical analysis. *Condor* **94(4)**: 903-911.
Bergin, T.M. (1997). Nest reuse by Western Kingbirds. *Wilson Bull.* **109(4)**: 735-737.
Bergman, G., Donner, K.O. & Haartman, L. eds. (1960). *Proceedings of the XII International Ornithological Congress, Helsinki, 1958*. Tilgmannin Kirjapaino, Helsinki.
Bergmanis, U. (1984). Dzeltengalvas cielava - *Motacilla citreola pall.* - jauna suga latvijas fauna. [The Citrine Wagtail - *Motacilla citreola pall.* - new species in Latvia]. *Rare Plants & Animals* **1984**: 46-49. In Latvian with Russian and English summary.
Bergmann, H.H. & Helb, H.W. (1982). *Stimmen der Vögel Europas*. BLV, München.
Bergstrom, E.A. (1951). The South Windsor Bank Swallow colony. *Bird-Banding* **22**: 54-63.
Berlepsch, H. von (1907). Studien über Tyranniden. *Ornis* **14**: 463-493.
Berlepsch, H. von & Hartert, E. (1902). On the birds of the Orinoco Region. *Novit. Zool.* **9**: 38.
Berlepsch, H. von & Stolzmann, J. (1906). Rapport sur les nouvelles collections ornithologiques faites au Perou para M. Jean Kalinowski. *Ornis* **13**: 63-133.
Berlijn, M., Meijer, P.C. & Plomp, M. (1997). Mongoolse Pieper op Maasvlakte in oktober 1996. [Blyth's Pipit on Maasvlakte in October 1996]. *Dutch Birding* **19(4)**: 177-181. In Dutch with English summary.
Berlioz, J. (1946). *Oiseaux de la Réunion*. Librairie LaRose, Paris.
Bernis, F. (1971). *Aves Migradoras Ibéricas*. SEO, Madrid.
Bernis, F. (1995). *Diccionario de Nombres Vernáculos de Aves*. Gredos, Madrid.
Berres, M.E. (2002). Long-term persistence of White-bearded Manakin (*Manacus manacus*) leks in the Arima Valley of Trinidad, West Indies. Pp. 131-137 in: Hayes & Temple (2002).
Berruti, A. (1992). Bird behaviour. *Albatross* **310**: 20.
Berruti, A., McIntosh, B., Walter, R. & Durbon, I. (1995). Parasitism of the Blue Swallow *Hirundo atrocaerulea* by the Greater Honeyguide *Indicator indicator*. *Ostrich* **66**: 94.
Berry, P.S.M. (1980). Cape and Long-tailed Wagtails in the Luangwa Valley. *Bull. Zambian Orn. Soc.* **12(2)**: 69-70.
Berry, R.J., Todd, W. & Plasse, R. (1982). Breeding the Scarlet Cock-of-the-rock *Rupicola peruviana* at the Houston Zoological Gardens. *Int. Zoo Yb.* **22**: 171-175.
Berthold, P. (2001). *Bird Migration: a General Survey*. 2nd edition. Oxford University Press, London.
Bertonatti, C. (1997). Nuestro libro rojo, No. 56: Pájaro Campana *Procnias nudicollis*. *Vida Silvestre* **58**: 21-22.
Bertoni, A. de W. (1901). *Aves Nuevas del Paraguay: Catálogo de las Aves del Paraguay*. Anales Científicos Paraguayos **1**. 216 pp.
Bertram, B.C.R. (1977). Variation in the wing-song of the Flappet Lark. *Anim. Behav.* **25(1)**: 165-170.
Bertucco, M. & Carlotto, L. (1991). Osservazioni sulla presenza estiva ed invernale di Rondine Montana, *Ptyonoprogne rupestris*, nel Vicentino. *Riv. Ital. Orn.* **61**: 14-24.
Beruldsen, G.R. (1973). Notes on the Albert Lyrebird. *Austr. Bird Watcher* **5**: 44-48.
Beruldsen, G.R. (1980). *A Field Guide to Nests and Eggs of Australian Birds*. Rigby, Adelaide.
Beser, H.J. (1968). Ergebnis der Zählungen und Untersuchungen am Rauch- und Mehlschwalbenbestand in einigen Orten des Landkreises Kempen-Krefeld in den Jahren 1966 und 1967. *Charadrius* **4**: 181-192.
Beshir, E.S.A. (1978). The Black-breasted Lark (*Melanocorypha bimaculata*), a pest of sorghum in Butana region, Gezira Province, Sudan. *Proc. Vertebrate Pest Conf.* **8**: 220-223.
Best, B.J. & Clarke, C.T. eds. (1991). *The Threatened Birds of the Sozoranga Region, Southwest Ecuador*. ICBP Study Report **44**, Cambridge.
Best, B.J. & Kessler, M. (1995). *Biodiversity and Conservation in Tumbesian Ecuador and Peru*. BirdLife International, Cambridge.
Best, B.J., Checker, M., Thewlis, R.M., Best, A.L. & Duckworth, W. (1996). New bird breeding data from southwestern Ecuador. *Orn. Neotropical* **7**: 69-73.
Best, B.J., Clarke, C.T., Checker, M., Broom, A., Thewlis, R.M., Duckworth, W. & McNab, A. (1993). Distributional records, natural history notes, and conservation of some poorly-known birds from southwestern Ecuador and northwestern Peru. *Bull. Brit. Orn. Club* **113(4)**: 234-255.
Best, B.J., Heijnen, T. & Williams, R.S.R. (1997). *A Guide to Bird-watching in Ecuador and the Galápagos Islands*. Biosphere Publications Ltd, Otley, UK.
Best, L.B. (1977). Bullsnake preys on Rough-winged Swallow nest. *Condor* **79(4)**: 509.
Betts, F.N. (1952). The breeding seasons of birds in the hills of south India. *Ibis* **94(4)**: 621-628.
Beyer, L.K. (1938). Nest life of the Bank Swallow. *Wilson Bull.* **50(2)**: 122-137.
Bezzel, E. & Fünfstück, H.J. (1995). Die Felsenschwalbe *Ptyonoprogne rupestris* in Werdenfelser Land/Oberbayern: Beobachtungen 1963 bis 1994. *Garmish. Vogelkd. Ber.* **24**: 1-12.
Biaggi, V. (1983). *Las Aves de Puerto Rico*. Editorial de la Universidad de Puerto Rico, Río Piedras, Puerto Rico.
Bian, X., Li, Q. & Takagi, N. (1988). Karyotypes of four species of larks (Alaudidae: Passeriformes). *Chromosome Inf. Serv.* **44**: 10-13.
Bibby, C.J. (1987). Foods of breeding merlins (*Falco columbarius*) in Wales. *Bird Study* **34(1)**: 64-70.
Biber, J.P. (1982). *Brutbiologie Untersuchungen an einer Population des Wasserpiepers (*Anthus spinoletta *L.)*. PhD thesis, Basle University, Basle, Switzerland.
Biber, J.P. (1986). Rock Pipit and Water Pipit *Anthus (s.) petrosus* and *A. (s.) spinoletta*. Pp. 296-299 in: Lack, P. ed. (1986). *The Atlas of Wintering Birds in Britain and Ireland*. T. & A.D. Poyser, Calton, UK.
Bierregaard, R.O. (1988). Morphological data from understory birds in *terra firme* forest in the central Amazonian basin. *Rev. Bras. Biol.* **48(2)**: 169-178.
Bierregaard, R.O., Stotz, D.F., Harper, L.H. & Powell, G.V.N. (1987). Observations on the occurrence and behaviour of the Crimson Fruitcrow *Haematoderus militaris* in central Amazonia. *Bull. Brit. Orn. Club* **107(3)**: 134-137.
Bijlsma, R.G. (1977). Voorkomen en oecologie van *Anthus spinoletta spinoletta* en *A. s. littoralis* in de uiterwaarden van de Rijn bij Wageningen. [The occurrence and ecology of *Anthus spinoletta spinoletta* and *A. s. littoralis* in the forelands of the river Rhine near Wageningen]. *Limosa* **50(3-4)**: 127-136. In Dutch with English summary.
Bijlsma, R.G. (1978a). Het Voorkomen van de Duinpieper *Anthus campestris* op de Zuidwest-Veluwe, Nederland, deel I: Broedtijd. [The occurrence of the Tawny Pipit *Anthus campestris* on the south-west Veluwe, The Netherlands, part I: breeding season]. *Limosa* **51(3-4)**: 107-121. In Dutch with English summary.
Bijlsma, R.G. (1978b). Het Voorkomen van de Duinpieper *Anthus campestris* op de Zuidwest-Veluwe, Nederland, deel II: Trektijd. [The occurrence of the Tawny Pipit *Anthus campestris* on the south-west Veluwe, The Netherlands, part II: migration]. *Limosa* **51(3-4)**: 122-131. In Dutch with English summary.
Bijlsma, R.G. (1990). Habitat, territoriumgrootte en broedsuccess van Duipiepers *Anthus campestris*. [Habitat, territory size and breeding success of Tawny Pipits *Anthus campestris*]. *Limosa* **63(2)**: 80-81. In Dutch with English summary.
Bijlsma, R.G., van Dijk, A.J., Hustings, F., Lensink, R. & Post, F. (1988). Strenge winters en schommelingen in de stand van de Boomleeuwerik *Lullula arborea* in Nederland: een verband? [Severe winters and fluctuations in the Woodlark *Lullula arborea* population in The Netherlands: a connection?] *Limosa* **61(2)**: 91-95.
Bijlsma, R.G., Lensink, R. & Post, F. (1985). De Boomleeuwerik *Lullula arborea* als broedvogel in Nederland in 1970-84. [The Woodlark *Lullula arborea* as a breeding bird in The Netherlands in 1970-84]. *Limosa* **58(3)**: 89-96.
Bijnens, L. & Upoki, A. (1992). Preliminary report of an ecological bird survey in virgin forest near Kisangani (Zaire). Pp. 475-480 in: Bennun (1992).
Bindl, W., Faas, M. & Schulze, C. (1990). Weiterer Nachweis der Kurzzehenlerche *Calandrella brachydactyla* für Bayern. *Anz. Orn. Ges. Bayern* **29(1)**: 63-65.
Binford, L.C. (1989). *A Distributional Survey of the Birds of the Mexican State of Oaxaca*. Ornithological Monographs **43**. American Ornithologists' Union, Washington, D.C. 418 pp.
Birchard, G.F., Kilgore, D.L. & Boggs, D.F. (1984). Respiratory gas concentrations and temperatures within the burrows of three species of burrow-nesting birds. *Wilson Bull.* **96(3)**: 451-456.
Birdsley, J.S. (2002). Phylogeny of the tyrant flycatchers (Tyrannidae) based on morphology and behavior. *Auk* **119(3)**: 715-734.
Birrer, S. (1994). Bachstelzen *Motacilla alba* an mehreren Winter Schlatplatzen in Sursee. [White Wagtails using different roosts in winter]. *Orn. Beob.* **91(3)**: 203-206. In German with English summary.
Bishop, C.A., Boermans, H.J., Ng, P., Campbell, G.D. & Struger, J. (1998). Health of Tree Swallows (*Tachycineta bicolor*) nesting in pesticide-sprayed apple orchards in Ontario, Canada. I. Immunological parameters. *J. Toxicol. Environm. Health* **55(8)**: 531-559.
Bishop, C.A., Koster, M.D., Chek, A.A., Hussell, D.J.T. & Jock, K. (1995). Chlorinated hydrocarbons and mercury in sediments, Red-winged Blackbirds (*Agelaius phoeniceus*) and Tree Swallows (*Tachycineta bicolor*) from wetlands in the Great Lakes St Lawrence River basin. *Environm. Toxicol. Chem.* **14**: 491-501.
Bishop, C.A., Mahoney, N.A., Trudeau, S. & Pettit, K.E. (1999). Reproductive success and biochemical effects in Tree Swallows (*Tachycineta bicolor*) exposed to chlorinated hydrocarbon contaminants in wetlands of the Great Lakes and St. Lawrence River basin, USA and Canada. *Environm. Toxicol. Chem.* **18**: 263-271.
Bishop, C.A., Van der Kraak, G.J., Ng, P., Smits, J.E.G. & Hontela, A. (1998). Health of Tree Swallows (*Tachycineta bicolor*) nesting in pesticide-sprayed apple orchards in Ontario, Canada. II. Sex and thyroid hormone concentrations and testes development. *J. Toxicol. Environm. Health* **55(8)**: 561-581.
Bishop, D., Borello, W.D. & Herremans, D. (1992). Interesting and unusual sightings. *Babbler* **24**: 59-61.
Bishop, Y. & Bishop, R. (1985). Welcome Swallows roosting in reedbeds. *Austr. Bird Watcher* **11(1)**: 33.
Bisson, I.A. (2004). *The Evolutionary History of Migration and Geographic Patterns of Vocalizations in the Cassin's Kingbird, Tyrannus vociferans*. PhD dissertation, York University, Toronto, Canada.
Bitterbaum, E.J. (1986). *The Comparative Behavior of Three Species of Swallows (Genus* Progne*)*. PhD thesis, University of Florida, Gainesville, Florida.
Blackburn, A. (1968). The birdlife of Codfish Island. *Notornis* **15(2)**: 51-65.
Blake, C.H. (1953). Notes on the Rough-winged Swallow. *Bird-Banding* **24**: 107-108.
Blake, E.R. (1950). Birds of the Acary Mountains, southern British Guiana. *Fieldiana Zool.* **32(7)**: 419-474.
Blake, E.R. (1953). *Birds of Mexico*. University of Chicago Press, Chicago, Illinois.
Blake, E.R. (1958). Birds of Volcán de Chiriquí, Panama. *Fieldiana Zool.* **36(5)**: 499-577.
Blake, E.R. (1961). Notes on a collection of birds from northeastern Colombia. *Fieldiana Zool.* **44(4)**: 25-44.
Blake, E.R. (1962). Birds of the Sierra Macarena, eastern Colombia. *Fieldiana Zool.* **44(11)**: 69-112.
Blake, E.R. & Hanson, H.C. (1942). Notes on a collection of birds from Michoacan, Mexico. *Field Mus. Nat. Hist. (Zool. Ser.)* **22(9)**: 513-551.
Blake, F.G. (1907). The nesting of *Stelgidopteryx serripennis* in Norwich, VT. *Auk* **24(1)**: 103-104.
Blake, J.G. & Loiselle, B.A. (1992a). Fruits in the diets of Neotropical migrant birds in Costa Rica. *Biotropica* **24**: 200-210.
Blake, J.G. & Loiselle, B.A. (1992b). Habitat use by Neotropical migrants at La Selva Biological Station and Brauho Carillo National Park, Costa Rica. Pp. 257–272 in: Hagan & Johnston (1992).
Blake, J.G. & Loiselle, B.A. (2002). Manakins (Pipridae) in second-growth and old-growth forests: pattern of habitat use, movement, and survival. *Auk* **119(1)**: 132-148.
Blake, R.W., Kolotylo, R. & de la Cueva, H. (1990). Flight speeds of the Barn Swallow, *Hirundo rustica*. *Can. J. Zool.* **68**: 1-5.
Blakers, M., Davies, S.J.J.F. & Reilly, P.N. (1984). *The Atlas of Australian Birds*. Royal Australasian Ornithologists' Union & Melbourne University Press, Carlton.
Blancher, P.J. (1982). *Food Supply, Predation, and Potential for Competition between Western and Cassin's Kingbirds*. PhD dissertation, Queen's Univeristy, Kingston, Ontario.
Blancher, P.J. & McNicol, D.K. (1988). Breeding biology of Tree Swallows in relation to wetland acidity. *Can. J. Zool.* **66**: 842-849.
Blancher, P.J. & McNicol, D.K. (1991). Tree Swallow diet in relation to wetland acidity. *Can. J. Zool.* **69**: 2629-2637.
Blancher, P.J. & Robertson, R.J. (1984). Resource use by sympatric kingbirds. *Condor* **86(3)**: 305-313.
Blancher, P.J. & Robertson, R.J. (1985). Predation in relation to spacing of kingbird nests. *Auk* **102(3)**: 654-658.
Blancher, P.J. & Robertson, R.J. (1987). Effects of food supply on the breeding biology of Western Kingbirds. *Ecology* **68**: 723-732.
Blancher, P.J., Furlonger, C.L. & McNicol, D.K. (1987). *Diet of Nestling Tree Swallows (*Tachycineta bicolor*) Near Sudbury, Ontario, Summer 1986*. Canadian Wildlife Service Technical Report **31**.

Blem, C.R. (1979). Predation of black rat snakes on a Bank Swallow colony. *Wilson Bull.* **91(1)**: 135-137.
Blem, C.R. & Blem, L.B. (1993). Do swallows sunbathe to control ectoparasites? An experimental test. *Condor* **95(3)**: 728-730.
Blendinger, P.G. (1998). Registros de aves poco frecuentes en la Argentina y sector antártico argentino. *Nuestras Aves* **38**: 5-8.
Bliss, T. (1997). Temminck's Coursers overshadow Malindi Pipits. *Kenya Birds* **6(1/2)**: 73-74.
Bloch, H., Poulsen, M.K., Rahbek, C. & Rasmussen, J.F. (1991). *A Survey of the Montane Forest Avifauna of the Loja Province, Southern Ecuador*. ICBP Study Report **49**. Cambridge.
Blondel, J. (1962). Données écologiques sur l'avifaune des Monts des Ksours (Sahara septentrional). *Terre Vie* **16**: 207-251.
Blondel, J., Chessel, D. & Frochot, B. (1988). Bird species impoverishment, niche expansion, and density inflation in Mediterranean island habitats. *Ecology* **69(6)**: 1899-1917.
Blondel, J., Vuilleumier, F., Marcus, L.F. & Terouanne, E. (1984). Is there ecomorphological convergence among Mediterranean bird communities of Chile, California, and France? *Evol. Biol.* **18**: 141-213.
Bó, N.A. (1969). Acerca de la afinidad de dos formas de *Serophaga*. *Neotrópica* **15**: 54-58.
Boano, G. (1981). Osservazioni ornitologiche effettuate durante un viaggio in Venezuela. *Doriana* **5(243)**: 114.
Bobeík, J. (2000). [A leucistic individual of the Crested Lark (*Galerida cristata*) occurred in Hodonín]. *Zpravy* **51**: 20.
Bock, C.E. & Bock, J.H. (1992). Response of birds to wildfire in native versus exotic Arizona grassland. *Southwest. Nat.* **37**: 73-81.
Bock, C.E. & Lynch, J.F. (1970). Breeding bird populations of burned and unburned conifer forest in the Sierra Nevada. *Condor* **72(2)**: 182–189.
Bock, C.E. & Webb, B. (1984). Birds as grazing indicator species in southeastern Arizona. *J. Wildl. Manage.* **48(3)**: 1045-1049.
Bock, W.J. (1985). The skeletomuscular system of the feeding apparatus of the Noisy Scrub-bird, *Atrichornis clamosus* (Passeriformes: Atrichornithidae). *Records Austr. Mus.* **37(3-4)**: 193-210.
Bock, W.J. (1994). *History and Nomenclature of Avian Family-group Names*. Bulletin of the American Museum of Natural History **222**, New York. 281 pp.
Bock, W.J. & Clench, M.H. (1985). Morphology of the Noisy Scrub-bird, *Atrichornis clamosus* (Passeriformes: Atrichornithidae): systematic relationships and summary. *Records Austr. Mus.* **37(3-4)**: 243-254.
de Boer, W.F. & Bento, C.M. (1999). *Birds of Inhaca Island, Mozambique*. Mondi BLSA Guide **22**. BirdLife South Africa, Johannesburg.
Boesman, P. (1995). Caño Colorado: a lowland tropical forest in north-east Venezuela. *Cotinga* **3**: 31-34.
Boesman, P. (1998). Some new information on the distribution of Venezuelan birds. *Cotinga* **9**: 27-39.
Boggs, G.O. (1961). Notas sobre las aves de "El Centro" en el valle medio del Río Magdalena, Colombia. *Noved. Colombianas* **1**: 401-423.
Böhm, C. (2000). *Die Wasserpieper. Vom Meeresstrand zum Gletscherrand*. Aula, Wiebelsheim, Germany.
Böhm, C. & Landmann, A. (1995). [Nest-site selection and nest construction in the Water Pipit (*Anthus spinoletta*)]. *J. Orn.* **136(1)**: 1-16. In German with English summary.
Bokerman, W. (1978). Observações sobre a nidificação de *Myiarchus ferox ferox* (Gmelin, 1789) (Aves, Tyrannidae). *Rev. Bras. Biol.* **38**: 565-567.
Boles, W.E. (1995). Preliminary analysis of the Passeriformes from Riversleigh, northwestern Queensland, Australia, with the description of a new species of lyrebird. *Cour. Forschungsinst. Senckenb.* **181**: 163-170.
Boles, W.E. & Tynan, B. (1995). Low altitude record of Rufous Scrub-bird *Atrichornis rufescens*. *Corella* **19(3)**: 91.
Bollmann, K. (1996). *The Mating System of the Alpine Water Pipit* Anthus spinoletta *in a Variable Environment: Ecological, Demographic and Fitness Aspects*. PhD thesis, University of Zürich, Zürich, Switzerland.
Bollmann, K. (1998). Why does monogamy prevail in the alpine Water Pipit *Anthus spinoletta*? Pp. 2666-2688 in: Adams & Slotow (1999).
Bollmann, K. & Reyer, H. (2001). Reproductive success of Water Pipits in an alpine environment. *Condor* **103(3)**: 510-520.
Bollmann, K., Reyer, H. & Brodmann, P.A. (1997). Territory quality and reproductive success: can Water Pipits *Anthus spinoletta* assess the relationship reliably? *Ardea* **85**: 83-98.
Bonaccorsi, G. (2002). La Bergeronnette printaniere a tete noire *Motacilla flava feldegg* en Corse. [Black-headed Wagtail (*Motacilla flava feldegg*) in Corsica]. *Alauda* **70(1)**: 230-232.
Bonaccorsi, G. & Rossi, T. (1997). Passage du Pipit à gorge rousse, *Anthus cervinus*, en Corse. *Riv. Ital. Orn.* **67(1)**: 13-20.
Bond, J. (1928a). The distribution and habits of the birds of the Republic of Haiti. *Proc. Acad. Nat. Sci. Philadelphia* **80**: 483-521.
Bond, J. (1928b). On the birds of Dominica, St. Lucia, St. Vincent, and Barbados, B.W.I. *Proc. Acad. Nat. Sci. Philadelphia* **80**: 523-545.
Bond, J. (1943). Nidification of the passerine birds of Hispaniola. *Wilson Bull.* **55(2)**: 115-125.
Bond, J. (1956a). Additional notes on Peruvian birds II. *Proc. Acad. Nat. Sci. Philadelphia* **108**: 227-247.
Bond, J. (1956b). *Check-list of Birds of the West Indies*. 4th edition. Academy of Natural Sciences, Philadelphia, Pennsylvania.
Bond, J. (1961a). *Extinct and Near Extinct Birds of the West Indies*. ICBP Pan-American Section Research Report **4**.
Bond, J. (1961b). Notes on the birds of Cozumel Island, Quintana Roo, Mexico. *Caribb. J. Sci.* **1**: 41-47.
Bond, J. (1963). *Eighth Supplement to the Checklist of Birds of the West Indies (1956)*. Academy of Natural Sciences of Philadelphia, Philadelphia, Pennsylvania.
Bond, J. (1971). *Sixteenth Supplement to the Checklist of Birds of the West Indies (1956)*. Academy of Natural Sciences of Philadelphia, Philadelphia, Pennsylvania.
Bond, J. (1984). *Twenty-fifth Supplement to the Checklist of Birds of the West Indies (1956)*. Academy of Natural Sciences of Philadelphia, Philadelphia, Pennsylvania.
Bond, J. (1985). *Birds of the West Indies*. 5th edition. Collins, London.
Bond, R., Convey, P., Sharpe, C. & Varey, A. (1989). Cambridge Columbus Zoological Expedition to Venezuela 1988. Unpublished report for the Cambridge Expeditions Committee, University of Cambridge, Cambridge, UK.
Bonde, K. (1993). *Birds of Lesotho*. University of Natal Press, Pietermaritzburg.
Borello, W.D. (1992). Botswana bird list: category A - rarities. October 1992. *Babbler* **24**: 53-56.
Borges, S.H., Cohn-Haft, M., Carvalhaes, A.M.P., Henriques, L.M., Pacheco, J.F. & Whittaker, A. (2001). Birds of the Jaú National Park, Brazilian Amazon: species check-list, biogeography and conservation. *Orn. Neotropical* **12**: 109-140.
Borges, S.H., Tonini, M. & de Almeida, R.A. (2000). Aves do complexo campina/campinarana/mata de terra firme do Parque Nacional do Jaú, Amazonas. Pp. 287-288 in: Straube *et al.* (2000). (Abstract).
Borgia, G., Pruett-Jones, S.G. & Pruett-Jones, M.A. (1985). The evolution of bower-building and the assessment of male quality. *J. Anim. Physiol. Anim. Nutr.* **67(1-4)**: 225-236. In English with German summary.
Bornschein, M.R. (2000). É igualmente brasileiro o registro de *Pseudocolopteryx dinellianus* (Passeriformes: Tyrannidae) para o Refúgio Biológico de Maracaju, uma reserva binacional (Paraguai-Brazil). *Nattereria* **1**: 23-24.
Bornschein, M.R., Cáceres, N.C., Ferreira, W.V., Ricco, D. & Pichorim, M. (2003). Primeiro registro de *Knipolegus aterrimus* Kaup, 1853 no Brasil (Tyrannidae). [First record of White-winged Black-tyrant (*Knipolegus aterrimus* Kaup, 1853) for Brazil (Tyrannidae)]. *Ararajuba* **11(1)**: 141-144. In Portuguese with English summary.
Bornschein, M.R., Reinert, B.L. & Pichorim, M. (1997). Notas sobre algumas aves novas ou pouco conhecidas no sul do Brasil. *Ararajuba* **5(1)**: 53-59.
Borrett, R.P. (1969a). New bird host records for *Icosta minor* (Bigot) (Diptera: Hippoboscidae) from Rhodesia. *Bull. Brit. Orn. Club* **89(6)**: 165.
Borrett, R.P. (1969b). A guide to the pipits of Rhodesia. *Honeyguide* **56**: 15.
Borrett, R.P. (1973). Notes on the food of some Rhodesian birds. *Ostrich* **44(3&4)**: 145-148.
Borrett, R.P. & Wilson, K.J. (1971a). Comparative feeding ecology of *Anthus novaeseelandiae* and *Anthus vaalensis* in Rhodesia. *Ostrich* **8**(Suppl.): 333-341.
Borrett, R.P. & Wilson, K.J. (1971b). Notes on the food of the Redcapped Lark. *Ostrich* **42**: 37-40.
Borrow, N. & Demey, R. (2001). *Birds of Western Africa*. Christopher Helm, London.
Bosque, C. & Bucher, E.H. (2002). Folivory in the White-tipped Plantcutter (*Phytotoma rutila*). Pp. 310-311 in: Anon. (2002a). (Abstract).
Bosso, A. (2001). *Todirostrum cinereum* (Tyrannidae), una nueva especie para la avifauna Argentina. *Hornero* **16(1)**: 49-50.
Bostwick, K.S. (1999). Sexual selection for wing sounds result in diversification of wing morphology in the Pipridae (Aves: Passeriformes). *Amer. Zool.* **38(5)**: 35A.
Bostwick, K.S. (2000). Display behaviors, mechanical sounds, and evolutionary relationships of the Club-winged Manakin (*Machaeropterus deliciosus*). *Auk* **117(2)**: 465-478.
Bostwick, K.S. (2002a). Phylogenetic and kinematic diversity of sonation in the Pipridae. Page 11 in: Anon. (2002a). (Abstract).
Bostwick, K.S. (2002b). Diverse mechanisms of mechanical sound production in the Pipridae. Page 225 in: Anon. (2002a). (Abstract).
Bostwick, K.S. & Prum, R.O. (1998). Clap, whistle, rasp, rattle, or vibrate? Alternative mechanisms of mechanical sound production in *Machaeropterus deliciosus* (Pipridae). Page 26 in: Anon. (1998b). (Abstract).
Bostwick, K.S. & Prum, R.O. (2003). High-speed video analysis of wing-snapping in two manakin clades (Pipridae: Aves). *J. Exper. Biol.* **206**: 2693-3706.
Bostwick, K.S. & Zyskowski, K. (2001). Mechanical sounds and sexual dimorphism in the Crested Doradito. *Condor* **103(4)**: 861-865.
Bouldin, L.E. (1968). The population of the House Martin *Delichon urbica* in East Lancashire. *Bird Study* **15**: 135-146.
Bourgonje, A. (1994). Overwinterende Oeverpiepers *Anthus spinoletta littoralis* in het Verdronken Land van Saeftinghe. [Wintering Scandinavian Rock Pipits *Anthus spinoletta littoralis* at "Verdroken Land van Saeftinghe"]. *Limosa* **67(3)**: 117-118. In Dutch with English summary.
Bourne, P.A. (1947). Notes on the Horsfield Bush-lark. *Emu* **47**: 1-10.
Bourne, W.R.P. (1955). The birds of the Cape Verde Islands. *Ibis* **97(3)**: 508-556.
Bourne, W.R.P. (1966). Further notes on the birds of the Cape Verde Islands. *Ibis* **108(3)**: 425-429.
Bourne, W.R.P. (1995). The origin and affinities of Berthelot's Pipit *Anthus berthelotii*. *Bull. Brit. Orn. Club* **115(1)**: 22-24.
Bourne, W.R.P. (2002). The evolution of pipits and finches. *British Birds* **95(3)**: 143-144.
Boutin, C., Freemark, K.E. & Kirk, D.A. (1999). Farmland birds in southern Ontario: field use, activity patterns and vulnerability to pesticide use. *Agric. Ecosyst. & Environm.* **72**: 239-254.
Boutin, J.M., Barbier, L. & Roux, D. (2001). Suivi des effectifs nicheurs d'Alaudidés, Colombidés et Turdidés en France: le programme ACT. [Monitoring breeding population of Alaudidae, Columbidae and Turdidae in France: The ACT Program]. *Alauda* **69(1)**: 53-61.
Bowden, C.G.R. (1990). Selection of foraging habitats by Woodlarks (*Lullula arborea*) nesting in pine plantations. *J. Appl. Ecol.* **27(2)**: 410-419.
Bowden, C.G.R. & Green, R.E. (1992). *The Ecology and Management of Woodlarks on Pine Plantations in the Thetford and Sandlings Forests*. RSPB Research Report, RSPB, Sandy, UK.
Bowden, C.G.R. & Hoblyn, R. (1990). The increasing importance of restocked conifer plantations for Woodlarks in Britain: implications and consequences. *RSPB Conserv. Rev.* **4**: 26-31.
Bowen, P.S.J. (1978). A large flock of Red-throated Cliff Swallow (*Hirundo rufigula*) at Mwinilunga. *Bull. Zambian Orn. Soc.* **10**: 30.
Bowen, P.S.J. (1979a). The spread of the Red-throated Cliff Swallow (*Hirundo rufigula*) in north-western province. *Bull. Zambian Orn. Soc.* **11**: 24-25.
Bowen, P.S.J. (1979b). Tree-nesting by the Lesser Striped Swallow. *Bull. Zambian Orn. Soc.* **11(2)**: 41-43.
Bowen, P.S.J. (1979c). The status of the African Saw-wing (*Psalidoprocne prisoptera*) at Mwinilunga. *Bull. Zambian Orn. Soc.* **11(1)**: 25-28.
Bowen, P.S.J. (1980). African Saw-wing (*Psalidoprocne prisoptera*) nesting in a garden pit at Mwinilunga. *Bull. Zambian Orn. Soc.* **12(1)**: 35-36.
Bowen, P.S.J. (1983a). Some observations on the Black-and-rufous Swallow *Hirundo nigrorufa* in Zambia. *Bull. Zambian Orn. Soc.* **13/15**: 23-35.
Bowen, P.S.J. (1983b). A second sight record of the South African Cliff Swallow *Hirundo spilodera* from Zambia. *Bull. Zambian Orn. Soc.* **13/15**: 122-123.
Bowen, P.S.J. & Colebrook-Robjent, J.F.R. (1984). The nest and eggs of the Black-and-Rufous Swallow *Hirundo nigrorufa*. *Bull. Brit. Orn. Club* **104(4)**: 146-147.
Bowers, R.K. & Dunning, J.B. (1987). Nutting's Flycatcher (*Myiarchus nuttingi*) from Arizona. *Amer. Birds* **41**: 5-10.
Bowers, R.K. & Dunning, J.B. (1994). Buff-breasted Flycatcher (*Empidonax fulvifrons*). No. **125** in: Poole, A.F. & Gill, F.B. eds. (1994). *The Birds of North America*. Vol. 4. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Bowland, A.E. (1984). Some habitat parameters of the Orange-throated Longclaw. *Ostrich* **55(1)**: 32-34.
Bowles, J.H. & Decker, F.R. (1927). A comparative field study of Wright's and Hammond's Flycatchers. *Auk* **44(4)**: 524-528.
Boycott, R.C. (1989). Late breeding record for Blue Swallows. *Afr. Wildl.* **43**: 247.
Boyd, R.L. (1976). *Behavioral Biology and Energy Expenditure in a Horned Lark Population*. PhD dissertation, Colorado State University, Fort Collins, Colorado.
Boyer, H.J. (1988). Breeding biology of the Dune Lark. *Ostrich* **59(1)**: 30-37.
Brace, R.C., Hornbuckle, J. & Pearce-Higgins, J.W. (1996). Records of wintering Hudson's Black-tyrant *Knipolegus hudsoni* at the Estación Biológica del Beni, Bolivia. *Cotinga* **5**: 67-68.
Brace, R.C., Hornbuckle, J. & Pearce-Higgins, J.W. (1997). The avifauna of the Beni Biological Station, Bolivia. *Bird Conserv. Int.* **7(2)**: 117-159.
Brackenbury, J. (1978). A possible relationship between respiratory movements, syringeal movements and the production of song by Skylarks *Alauda arvensis*. *Ibis* **120(4)**: 526-528.
Bradbury, R.B. & Bradter, U. (2004). Habitat associations of Yellow Wagtails *Motacilla flava flavissima* on lowland wet grassland. *Ibis* **146(2)**: 241-246.
Bradley, P.E. (1985). *Birds of the Cayman Islands*. Published privately. Georgetown, Grand Cayman.
Bradley, P.E. (2000). *The Birds of the Cayman Islands. An Annotated Check-list*. BOU Check-list **19**. British Ornithologists' Union, Tring, UK.
Bradshaw, C.G. (1994). Blyth's Pipit identification. *British Birds* **87(3)**: 136-142.
Bradshaw, C.G. & Kirwan, G.M. (1995). A description of the nest of Fiery-capped Manakin *Machaeropterus pyrocephalus* from northern Bolívar, Venezuela. *Cotinga* **4**: 30-31.
Braillon, B. (1970). L'Hirondelle de rivage, *Riparia riparia*, en Basse-Normandie: les colonies et leurs effectifs: biométrie de l'aile; reprises d'oiseaux bagués. *Cormoran* **1**: 129-151.
Brandt, H. (1951). *Arizona and its Bird Life*. Bird Research Foundation, Cleveland, Ohio.
Brash, A. (1994). Exit Knysna's African Pied Wagtail. *Bee-eater* **45(1)**: 12.
Brathwaite, D.H. (1974). *Native Birds of New Zealand*. Bascands, Christchurch, Australia.
Braun, M.J., Robbins, M.B., Milensky, C.M., O'Shea, B.J., Barber, B.R., Hinds, W. & Prince, W.S. (2003). New birds for Guyana from Mts Roraima and Ayanganna. *Bull. Brit. Orn. Club* **123(1)**: 24-33.
Brauning, D.W. (1992). Acadian Flycatcher *Empidonax virescens*. Pp. 200–201 in: Brauning, D.W. (1992). *Atlas of Breeding Birds in Pennsylvania*. University of Pittsburgh Press, Pittsburgh, Pennsylvania.
Bravery, J.A. (1962). Notes on *Mirafra javanica* in the Atherton District, North Queensland. *Emu* **62**: 55-58.
Brawn, J.D. (1990). Interspecific competition and social behavior in Violet-green Swallows. *Auk* **107(3)**: 606-608.
Brawn, J.D. & Balda, R.P. (1988a). Population biology of cavity nesters in northern Arizona: do nest sites limit breeding densities? *Condor* **90(1)**: 61-71.
Brawn, J.D. & Balda, R.P. (1988b). The influence of silvicultural activity on ponderosa pine forest bird communities in the southwestern United States. *Bird Conserv.* 3: 3–21.
Brazil, M.A. (1991). *The Birds of Japan*. Christopher Helm, London.
Brazil, M.A. & Cook, C. (1991). The first spring record of a Shore Lark *Eremophila alpestris* from Japan. *J. Yamashina Inst. Orn.* **22(1)**: 77-79.
Breckenridge, W.J. (1956). Measurements of the habitat niche of the Least Flycatcher. *Wilson Bull.* **68(1)**: 47-51.
Bregulla, H.L. (1992). *Birds of Vanuatu*. Anthony Nelson, Oswestry, UK.
Breitenmoser-Würsten, C. & Marti, C. (1987). Verbreitung und Siedlungsdichte von Wasseramsel *Cinclus cinclus* und Bergstelze *Motacilla cinerea* in Saanenland (Berner Oberland). *Orn. Beob.* **84**: 151-172.
Breitwisch, R. & Pliske, M. (1974). Anthurium fruit as a food of White-Bearded Manakins. *Ibis* **116(3)**: 365.
Brewka, B., Meissner, W., Sikora, A. & Skakuj, M. (1988). [The next records of Citrine Wagtail and its diagnostic characters]. *Notatki Orn.* **29(3-4)**: 212-219. In Polish with English summary.
Brewster, C.A. (1998). Large numbers of Stark's Larks *Eremalauda starki* in southwestern Botswana. *Babbler* **34**: 26-27.
Brewster, C.A. & Major, S.M. (2000). Report from the records subcommittee: category A records. *Babbler* **37**: 52.
Brewster, C.A. & Tyler, S.J. (2002). Cape Wagtails *Motacilla capensis* in Botswana. *Babbler* **41**: 18-23.
Bridgeford, M., Kreft, C., Castle-Smith, S. & Bradshaw, J. (2000). In search of Namibian endemics. *BirdLife South Afr. Newsl.* **3(3)**: 28-29.
Bridgeford, P.A. & Bridgeford, M. (1993). South African Cliff Swallows in Namibia. *Lanioturdus* **27**: 53-56.
Bridges, D. & Leatherman, D.A. (1991). Sprague's Pipits and some associated bird species in extreme northeastern Colorado. *J. Colo. Field Orn.* **25(4)**: 115-118.
Briggs, P. & van Zandbergen, A. (2002). Rare Golden Pipit. *CCA Ecol. J.* **4**: 56.

van den Brink, B., Bijlsma, R.G. & van der Have, T.M. (1997). *European Swallows* Hirundo rustica *in Botswana*. WIWO Research Report **56**. Working Group International Wader and Waterfowl Foundation, Zeist, Netherlands. 102 pp.
van den Brink, B., Bijlsma, R.G. & van der Have, T.M. (2000). European Swallows *Hirundo rustica* in Botswana during three non-breeding seasons: the effects of rainfall on moult. *Ostrich* **71(1&2)**: 198-204.
Brinkman, J.J. (1987). Short-toed Lark on Texel in May 1986. *Dutch Birding* **9(4)**: 174-175.
Briones, E.E. (1991). La importancia de la reserva Maquipucuna en la conservación de las aves. No. **102** in: Anon. (1991). (Abstract).
Briskie, J.V. (1994). Least Flycatcher (*Empidonax minimus*). No. **99** in: Poole & Gill (1994).
Briskie, J.V. & Sealy, S.G. (1989a). Determination of clutch size in the Least Flycatcher. *Auk* **106(2)**: 269-278.
Briskie, J.V. & Sealy, S.G. (1989b). Nest failure and the evolution of hatching asynchrony in the Least Flycatcher. *J. Anim. Ecol.* **58**: 653-665.
Briskie, J.V., Sealy, S.G. & Hobson, K.A. (1990). Differential parasitism of Least Flycatchers and Yellow Warblers by the Brown-headed Cowbird. *Behav. Ecol. Sociobiol.* **27**: 403-410.
Britton, D.J. (1984). Identification pitfalls and assessment problems. 9. Richard's Pipit *Anthus novaeseelandiae* and Tawny Pipit *A. campestris*. *British Birds* **77**: 412-415.
Britton, D.J. (1991). Identification of Meadow and Red-throated Pipits. *British Birds* **84**: 514.
Britton, P.L. (1970). Birds of the Balovale District of Zambia. *Ostrich* **41**: 145-190.
Britton, P.L. ed. (1980). *Birds of East Africa. Their Habitat, Status and Distribution*. East African Natural History Society, Nairobi.
Britton, P.L. & Britton, H.A. (1978). The Malindi Pipit *Anthus melindae* in coastal Kenya. *Ibis* **120(2)**: 215-219.
Britton, P.L. & Zimmerman, D.A. (1979). The avifauna of Sokoke Forest, Kenya. *J. East Afr. Nat. Hist. Soc. & Natl. Mus.* **169**: 1-15.
Britton, P.L., Stuart, S.N. & Turner, D.A. (1984). East African endangered species. Pp. 81-96 in: Ledger (1984).
Broadbent, J. (1969a). Observations on the roosting of Yellow Wagtails *Budytes flavus* in Ibadan. *Bull. Niger Orn. Soc.* **6**: 33.
Broadbent, J. (1969b). A note on the Preuss's Cliff Swallows *Lecythoplastes preussi* at Oyo New Reservoir. *Bull. Niger. Orn. Soc.* **6**: 34.
Brock, B.J. (1978). Unusual feeding behaviour of swallows. *South Austr. Orn.* **27(8)**: 288.
Brodkorb, P. (1942). Notes on some races of the Rough-winged Swallow. *Condor* **44(5)**: 214-217.
Brodkorb, P. (1943). Birds from the gulf lowlands of southern Mexico. *Misc. Publ. Univ. Mich. Mus. Zool.* **55**: 1-90.
Brodkorb, P. (1950). Geographic variation in the Gray Kingbird, *Tyrannus dominicensis*. *Auk* **67(3)**: 333-344.
Brodkorb, P. (1978). Catalogue of fossil birds. Part 5 (Passeriformes). *Bull. Florida State Mus. Biol. Sci.* **23(3)**: 139-228.
Brodmann, P.A. & Reyer, H.U. (1999). Nestling provisioning in Water Pipits (*Anthus spinoletta*): do parents go for specific nutrients or profitable prey? *Oecologia* **120(4)**: 506-514.
Brodmann, P.A., Reyer, H.U. & Baer, B. (1997). The relative importance of habitat structure and of prey characteristics for the foraging success of Water Pipits (*Anthus spinoletta*). *Ethology* **103(3)**: 222-235.
Brodmann, P.A., Reyer, H.U., Bollmann, K., Schlapfer, A.R. & Raunter, C. (1997). The importance of food quantity and quality for reproductive performance in Alpine Water Pipits (*Anthus spinoletta*). *Oecologia* **109(2)**: 200-208.
Broekhuysen, G.J. (1960). Larger Stripe-breasted Swallow *Cecropis cucullata* feeding on vegetable matter. *Ostrich* **31**: 26.
Broekhuysen, G.J. (1963). Thick-billed Lark (*Calendula magnirostris*) feeding on bulbs. *Ostrich* **34**: 251.
Broekhuysen, G.J. (1974). Third report on migration in southern Africa. *Ostrich* **45**: 235-250.
Broekhuysen, G.J. & Brown, A.R. (1963). The moulting pattern of European Swallows, *Hirundo rustica*, wintering in the surroundings of Cape Town, South Africa. *Ardea* **51(1)**: 25-43.
Broekhuysen, G.J. & Stanford, W.P. (1954). Display in S. A. Sand Martin (*Riparia paludicola paludicola*). *Ostrich* **25**: 99.
Bromfield, G., Ritchie, W.N., Bromfield, V., Ritchie, J. & Hennessey, A.B. (2004). New information on plumage, nesting, behaviour and vocalisations of the Bolivian Swallow-tailed Cotinga *Phibalura flavirostris boliviana* from the Apolo area of Madidi National Park, Bolivia. *Cotinga* **21**.
Brooke, M.L. (1987). *The Birds of the Juan Fernández Islands, Chile*. ICBP Study Report **16**. 50 pp.
Brooke, M.L., Scott, D.A. & Teixeira, D.M. (1983). Some observations made at the first recorded nest of the Sharpbill *Oxyruncus cristatus*. *Ibis* **125(2)**: 259-261.
Brooke, R.K. (1958). Incubation and nestling periods revealed by Rhodesian nest record cards. *Ostrich* **29**: 133-136.
Brooke, R.K. (1970). Birds eating winged termites. *Honeyguide* **64**: 17-18, 38.
Brooke, R.K. (1972a). Generic limits in Old World Apodidae and Hirundinidae. *Bull. Brit. Orn. Club* **92(2)**: 53-57.
Brooke, R.K. (1972b). Second sighting of Golden Pipit in 66 years. *Bokmakierie* **24(3)**: 53.
Brooke, R.K. (1974a). *Review of the Classification of the Hirundinidae (Aves: Passeriformes) with Particular Reference to those of the Old World*. MSc thesis, University of Natal, Pietermaritzburg, South Africa.
Brooke, R.K. (1974b). Nomenclatural notes on and the type-localities of some taxa in the Apodidae and the Hirundinidae (Aves). *Durban Mus. Novit.* **10(9)**: 127-137.
Brooke, R.K. (1975). *Cotyle paludibula* Rüppell, 1835. *Bull. Brit. Orn. Club* **95(3)**: 90-91.
Brooke, R.K. (1984a). An assessment of rare, vulnerable and endangered South African breeding birds. Pp. 567-576 in: Ledger (1984).
Brooke, R.K. (1984b). *South African Red Data Book - Birds*. South African National Scientific Programmes Report **97**. Council for Scientific and Industrial Research, Pretoria.
Brooke, R.K. (1985). Mountain Pipit or Thick-billed Lark? *Safring News* **14**: 67-68.
Brooke, R.K. (1988). Is the Bimaculated Lark *Melanocorypha bimaculata* a valid member of the southern African avifauna? *Ostrich* **59(2)**: 76-77.
Brooke, R.K. (1991). The southwestern breeding range of the South African Cliff Swallow. *Promerops* **197**: 12-13.
Brooke, R.K. & Irwin, M.P.S. (1972). A second record of the pipit *Tmetothylacus tenellus*. *Bull. Oriental Bird Club* **92**: 91.
Brooke, R.K. & Ryan, P. (1988). South African Cliff Swallow (528) colonies in the western Karoo. *Promerops* **185**: 15.
Brooke, R.K. & Vernon, C.J. (1961). Aspects of the breeding biology of the Rock Martin. *Ostrich* **32**: 51-52.
Brooks, D.J., Evans, M.I., Martins, R.P. & Porter, R.F. (1987). The status of birds in North Yemen and the records of the OSME expedition in autumn 1985. *Sandgrouse* **9**: 4-66.
Brooks, D.M., Pando, L. & Ocmin, A. (1999). Comparative life history of cotingas in the northern Peruvian Amazon. *Orn. Neotropical* **10(2)**: 193-206.
Brooks, J.E., Ahmad, E. & Hussain, I. (1987). A newly-reported pest bird in Pakistan: the Crested Lark. *Pakistan J. Zool.* **19(4)**: 437-438.
Brooks, T.M., Barnes, R., Bartrina, L., Butchart, S.H.M., Clay, R.P., Esquivel, E.Z., Etcheverry, N.I., Lowen, J.C. & Vincent, J.P. (1993). *Bird Surveys and Conservation in the Paraguayan Atlantic Forest: Project CANOPY '92 Final Report*. BirdLife Study Report **57**. BirdLife International, Cambridge.
Broom, D.M., Dick, W.J.A., Johnson, C.E., Sales, D.I. & Zahavi, A. (1976). Pied Wagtail roosting and feeding behaviour. *Bird Study* **23**: 267-269.
Brosset, A. (1956). Les oiseaux du Maroc Oriental, de la Méditerranée à Berguent. *Alauda* **24**: 161-205.
Brosset, A. (1961). *Écologie des Oiseaux du Maroc Oriental*. Travaux de l'Institut Scientifique Chérifien (Ser. Zoologie) **22**. 155 pp.
Brosset, A. (1971). Territorialisme et défense du territoire chez les migrateurs paléarctiques hivernant au Gabon. *Alauda* **39(2)**: 127-131.
Brosset, A. & Érard, C. (1977). New faunistic records from Gabon. *Bull. Brit. Orn. Club* **97(4)**: 125-132.
Brosset, A. & Érard, C. (1986). *Les Oiseaux des Régions Forestières du Nord-est du Gabon. Écologie et Comportement des Espèces*. Vol. 1. Société Nationale du Protection de la Nature, Paris.
Brothers, N., Pemberton, D., Pryor, H. & Halley, V. (2001). *Tasmania's Offshore Islands: Seabirds and other Natural Features*. Tasmanian Museum and Art Gallery, Hobart, Tasmania.
Broun, W.J. & Broun, M. (1970). Welcome Swallow at Lake Okareka. *Notornis* **17(2)**: 129.
Brouwer, J. & Garnett, S.T. eds. (1990). *Threatened Birds of Australia. An Annotated List*. RAOU Report **68**. Royal Australasian Ornithologists Union, Victoria.
Brown, A.F. & Atkinson, P.W. (1996). Habitat associations of coastal wintering passerines. *Bird Study* **43**: 188-200.
Brown, A.J. (1986). Hour-long song flight by Skylark. *British Birds* **79(3)**: 136.
Brown, C.J. (1990). The birds of the West Caprivi Strip, Namibia. *Lanioturdus* **25**: 22-37.
Brown, C.J. (1993). The birds of Owambo, Namibia. *Madoqua* **18(2)**: 147-161.
Brown, C.R. (1973). A second brood attempt by the Purple Martin. *Auk* **90(2)**: 442.
Brown, C.R. (1975). Polygamy in the Purple Martin. *Auk* **92(3)**: 602-604.
Brown, C.R. (1976a). Use of gravel by Purple Martins. *Auk* **93(4)**: 842.
Brown, C.R. (1976b). Minimum temperature for feeding by Purple Martins. *Wilson Bull.* **88(4)**: 672-673.
Brown, C.R. (1977a). A record of intraspecific injury in the Purple Martin. *Bird-Banding* **48(3)**: 273.
Brown, C.R. (1977b). Purple Martins versus starlings and House Sparrows in nest site competition. *Bull. Texas Orn. Soc.* **10(2)**: 31-35.
Brown, C.R. (1977c). Unusual feeding behavior of a male Purple Martin. *Bull. Texas Orn. Soc.* **10(1)**: 15-16.
Brown, C.R. (1978a). A reinterpretation of the "Stooped-Submissive" posture in the Purple Martin. *Bull. Texas Orn. Soc.* **11(2)**: 47-48.
Brown, C.R. (1978b). Sexual chase in Purple Martins. *Auk* **95(3)**: 588-590.
Brown, C.R. (1978c). Double-broodedness in Purple Martins in Texas. *Wilson Bull.* **90(2)**: 239-247, 657.
Brown, C.R. (1978d). On early spring arrival of Purple Martins. *Bird-Banding* **49(2)**: 130-133.
Brown, C.R. (1978e). Clutch size and reproductive success of adult and subadult Purple Martins. *Southwest. Nat.* **23(4)**: 597-604.
Brown, C.R. (1978f). Post-fledging behavior of Purple Martins. *Wilson Bull.* **90(3)**: 376-385.
Brown, C.R. (1978g). Juvenile Purple Martins: field identification and post-fledging nest defense. *Bull. Texas Orn. Soc.* **11(1)**: 25-27.
Brown, C.R. (1979a). Chick recognition in Purple Martins (Passeriformes: Hirundinidae). *Southwest. Nat.* **24(4)**: 683-685.
Brown, C.R. (1979b). Territoriality in the Purple Martin. *Wilson Bull.* **91(4)**: 583-591.
Brown, C.R. (1980). Sleeping behavior of Purple Martins. *Condor* **82(2)**: 170-175.
Brown, C.R. (1981a). The impact of Starlings on Purple Martin populations in unmanaged colonies. *Amer. Birds* **35(3)**: 266-268.
Brown, C.R. (1981b). Purple Martins feeding on cicadas. *Southwest. Nat.* **25(4)**: 553.
Brown, C.R. (1983a). Mate replacement in Purple Martins: little evidence for altruism. *Condor* **85(1)**: 106-107.
Brown, C.R. (1983b). Vocalizations and behavior of Violet-green Swallows in the Chiricahua Mountains, Arizona. *Wilson Bull.* **95(1)**: 142-145.
Brown, C.R. (1984a). Vocalizations of the Purple Martin. *Condor* **86(4)**: 433-442.
Brown, C.R. (1984b). Light-breasted Purple Martins dominate dark-breasted birds in a roost: implications for female mimicry. *Auk* **101(1)**: 162-164.
Brown, C.R. (1984c). Laying eggs in a neighbor's nest: benefit and cost of colonial nesting in swallows. *Science* **224**: 518-519.
Brown, C.R. (1985). Vocalizations of Barn and Cliff Swallows. *Southwest. Nat.* **30**: 325-333.
Brown, C.R. (1986). Cliff Swallow colonies as information centers. *Science* **234**: 83-85.
Brown, C.R. (1988a). Social foraging in Cliff Swallows: local enhancement, risk sensitivity, competition and the avoidance of predators. *Anim. Behav.* **36**: 780-792.
Brown, C.R. (1988b). Enhanced foraging efficiency through information centers: a benefit of coloniality in Cliff Swallows. *Ecology* **69**: 602-613.
Brown, C.R. (1997). Purple Martin (*Progne subis*). No. **287** in: Poole & Gill (1997).
Brown, C.R. & Bitterbaum, E.J. (1980). Implications of juvenile harassment in Purple Martins. *Wilson Bull.* **92(4)**: 452-457.
Brown, C.R. & Brown, M.B. (1986). Ectoparasitism as a cost of coloniality in Cliff Swallows (*Hirundo pyrrhonota*). *Ecology* **67**: 1206-1218.
Brown, C.R. & Brown, M.B. (1987). Group-living in Cliff Swallows as an advantage in avoiding predators. *Behav. Ecol. Sociobiol.* **21**: 97-107.
Brown, C.R. & Brown, M.B. (1988a). Genetic evidence of multiple parentage in broods of Cliff Swallows. *Behav. Ecol. Sociobiol.* **23**: 379-387.
Brown, C.R. & Brown, M.B. (1988b). The costs and benefits of egg destruction by conspecifics in colonial Cliff Swallows. *Auk* **105(4)**: 737-748.
Brown, C.R. & Brown, M.B. (1988c). A new form of reproductive parasitism in Cliff Swallows. *Nature* **331**: 66-68.
Brown, C.R. & Brown, M.B. (1989). Behavioural dynamics of intraspecific brood parasitism in colonial Cliff Swallows. *Anim. Behav.* **37**: 777-796.
Brown, C.R. & Brown, M.B. (1991). Selection of high-quality host nests by parasitic Cliff Swallows. *Anim. Behav.* **41(3)**: 457-465.
Brown, C.R. & Brown, M.B. (1992a). Ectoparasitism as a cause of natal dispersal in Cliff Swallows. *Ecology* **73(5)**: 1718-1723.
Brown, C.R. & Brown, M.B. (1992b). First record of the Cave Swallow for Nebraska. *Nebr. Bird Rev.* **60(1)**: 36-40.
Brown, C.R. & Brown, M.B. (1995). Cliff Swallow (*Hirundo pyrrhonota*). No. **149** in: Poole & Gill (1995).
Brown, C.R. & Brown, M.B. (1996). *Coloniality in the Cliff Swallow: the Effect of Group Size on Social Behavior*. University of Chicago Press, Chicago, Illinois.
Brown, C.R. & Brown, M.B. (1998a). Intense natural selection on body size and wing and tail asymmetry in Cliff Swallows during severe weather. *Evolution* **52(5)**: 1461-1475.
Brown, C.R. & Brown, M.B. (1998b). Fitness components associated with alternative reproductive tactics in Cliff Swallows. *Behav. Ecol.* **9(2)**: 158-171.
Brown, C.R. & Brown, M.B. (1999a). Barn Swallow (*Hirundo rustica*). No. **452** in: Poole & Gill (1999).
Brown, C.R. & Brown, M.B. (1999b). Natural selection on tail and bill morphology in Barn Swallows *Hirundo rustica* during severe weather. *Ibis* **141(4)**: 652-659.
Brown, C.R. & Brown, M.B. (1999c). Fitness components associated with laying date in the Cliff Swallow. *Condor* **101(2)**: 230-245.
Brown, C.R. & Brown, M.B. (1999d). Fitness components associated with clutch size in Cliff Swallows. *Auk* **116(2)**: 467-486.
Brown, C.R. & Brown, M.B. (2000a). Nest spacing in relation to settlement time in colonial Cliff Swallows. *Anim. Behav.* **59(1)**: 47-55.
Brown, C.R. & Brown, M.B. (2000b). Heritable basis for choice of group size in a colonial bird. *Proc. Natl. Acad. Sci. USA* **97**: 14825-14830.
Brown, C.R. & Brown, M.B. (2000c). Weather-mediated natural selection on arrival time in Cliff Swallows (*Petrochelidon pyrrhonota*). *Behav. Ecol. Sociobiol.* **47(5)**: 339-345.
Brown, C.R. & Brown, M.B. (2001). Egg hatchability increases with colony size in Cliff Swallows. *J. Field Orn.* **72**: 113-123.
Brown, C.R. & Brown, M.B. (2002). Does intercolony competition for food affect colony choice in Cliff Swallows? *Condor* **104(1)**: 117-128.
Brown, C.R. & Hoogland, J.L. (1986). Risk in mobbing for solitary and colonial swallows. *Anim. Behav.* **34**: 1319-1323.
Brown, C.R. & Sherman, L.C. (1989). Variation in the appearance of swallow eggs and the detection of intraspecific brood parasitism. *Condor* **91(3)**: 620-627.
Brown, C.R. & Wolfe, S.D. (1978). Post-breeding movements of Purple Martins in the Lake Texoma area. *Bull. Texas Orn. Soc.* **11(1)**: 22-23.
Brown, C.R., Brown, M.B. & Danchin, E. (2000). Breeding habitat selection in Cliff Swallows: the effect of conspecific reproductive success on colony choice. *J. Anim. Ecol.* **69(1)**: 133-142.
Brown, C.R., Brown, M.B. & Rannala, B. (1995). Ectoparasites reduce long-term survival of their avian host. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **262**: 313-319.
Brown, C.R., Brown, M.B. & Shaffer, M.L. (1991). Food-sharing signals among socially foraging Cliff Swallows. *Anim. Behav.* **42(4)**: 551-564.
Brown, C.R., Knott, A.M. & Damrose, E.J. (1992). Violet-green Swallow. No. **14** in: Poole, A.F. & Gill, F.B. eds. (1992). *The Birds of North America*. Vol. 1. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Brown, C.R., Komar, N., Quick, S.B., Sethi, R.A., Panella, N.A., Brown, M.B. & Pfeffer, M. (2001). Arbovirus infection increases with group size. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **268**: 1833-1840.
Brown, C.R., Sas, C.M. & Brown, M.B. (2002). Colony choice in Cliff Swallows: effects of heterogeneity in foraging habitat. *Auk* **119(2)**: 446-460.
Brown, G.K. & Palfery, J. (1986). The Small Skylark, a new species for Saudi Arabia. *Sandgrouse* **7**: 55–59.
Brown, J.S., Kotler, B.P. & Mitchell, W.A. (1997). Competition between birds and mammals: a comparison of giving-up densities between Crested Larks and gerbils. *Evol. Ecol.* **11(6)**: 757-771.
Brown, L.H. & Britton, P.L. (1980). *The Breeding Seasons of East African Birds*. East Africa Natural History Society, Nairobi.
Brown, R.J., Brown, M.N. & Pessotto, B. (1990). Sedentary Welcome Swallows *Hirundo neoxena* in the south-west of western Australia. *Corella* **14(3)**: 86-87.
Browne, P.W.P. (1981). Breeding of six Palearctic birds in southwest Mauritania. *Bull. Brit. Orn. Club* **101(2)**: 306-310.
Browne, S., Vickery, J. & Chamberlain, D. (2000). Densities and population estimates of breeding Skylarks *Alauda arvensis* in Britain in 1997. *Bird Study* **47(1)**: 52-65.

Browning, M.R. (1992). Geographic variation in *Hirundo pyrrhonota* (Cliff Swallow) from northern North America. *Western Birds* **23**: 21-29.

Browning, M.R. (1993). Comments on the taxonomy of *Empidonax traillii* (Willow Flycatcher). *Western Birds* **24**: 241-257.

Browning, M.R. & Monroe, B.L. (1991). Clarifications and corrections of the dates of issue of some publications containing descriptions of North American birds. *Arch. Nat. Hist.* **18(3)**: 381-405.

Bruce, M.D. (1987). Additions to the birds of Wallacea. I. Bird records from smaller islands in the Lesser Sundas. *Kukila* **3(1-2)**: 38-44.

Brudenell-Bruce, P.G.C. (1975). *The Birds of New Providence and the Bahama Islands*. Collins, London.

Bruderer, B. (1975). Zur Schwalbenkatastrophe im Herbst 1974. *Tierwelt* **4**: 3-20.

Brugiere, D. (1988). Alouettes hausse-col (*Eremophila alpestris*) dans le Val d'Allier bourbonnais. *Alauda* **56(4)**: 437.

Brumfield, R.T. & Braun, M.J. (2001). Phylogenetic relationships in bearded manakins (Pipridae: *Manacus*) indicate that male plumage color is a misleading taxonomic marker. *Condor* **103(2)**: 248-258.

Brumfield, R.T., Jernigan, R.W., McDonald, D.B. & Braun, M.J. (2001). Evolutionary implications of divergent clines in an avian (*Manacus*: Aves) hybrid zone. *Evolution* **55(10)**: 2070-2087.

Bruns, H. (1994). Unstimmigkeiten bei den Feldkennzeichen der Heidelerche *Lullula arborea*. *Orn. Mitt.* **46(8)**: 199-206.

Brunton, D.F. & Crins, W.J. (1975). Status and habitat preference of the Yellow-bellied Flycatcher in Algonquin Park, Ontario. *Ontario Field Biol.* **29**: 25–28.

Brush, A.H. (1969). On the nature of "cotingin". *Condor* **71(4)**: 431-433.

Brush, T. (1998). Current status and recent nesting of Northern Beardless Tyrannulet and Tropical Parula in the Lower Rio Grande Valley, Texas. Pp. 33-34 in: Anon. (1998b). (Abstract).

Brush, T. (1999a). Couch's Kingbird (*Tyrannus couchii*). No. **437** in: Poole, A.F. & Gill, F.B. eds. (1999). *The Birds of North America*. Vol. 11. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.

Brush, T. (1999b). Current status of Northern Beardless Tyrannulet and Tropical Parula in Bentsen-Rio Grande Valley State Park and Santa Ana National Wildlife Refuge, southern Texas. *Bull. Texas Orn. Soc.* **32(1)**: 2-12.

Brush, T. & Fitzpatrick, J.W. (2002). Great Kiskadee (*Pitangus sulphuratus*). No. **622** in: Poole & Gill (2002)..

Bryant, D.M. (1973). Factors influencing the selection of food by the House Martin (*Delichon urbica* (L.)). *J. Anim. Ecol.* **42(3)**: 539-564.

Bryant, D.M. (1975). Breeding biology of House Martins *Delichon urbica* in relation to aerial insect abundance. *Ibis* **117(2)**: 180-216.

Bryant, D.M. (1978a). Establishment of weight hierarchies in the broods of House Martins *Delichon urbica*. *Ibis* **120(1)**: 16-26.

Bryant, D.M. (1978b). Environmental influences on growth and survival of nestling House Martins *Delichon urbica*. *Ibis* **120(3)**: 271-283.

Bryant, D.M. (1979). Reproduction costs in the House Martin. *J. Anim. Ecol.* **48**: 655-675.

Bryant, D.M. (1983). Heat stress in tropical birds: behavioural thermoregulation during flight. *Ibis* **125(3)**: 313-323.

Bryant, D.M. (1985). Swallow. Pp. 571-572 in: Campbell & Lack (1985).

Bryant, D.M. (1988). Lifetime reproductive success of House Martins. Pp. 173-188 in: Clutton-Brock, T.H. ed. (1988). *Reproductive Success: Studies of Individual Variation in Contrasting Breeding Systems*. University of Chicago Press, Chicago, Illinois.

Bryant, D.M. (1989). House Martin. Pp. 89-106 in: Newton, I. ed. (1989). *Lifetime Reproduction in Birds*. Academic Press, London.

Bryant, D.M. & Bryant, V.M.T. (1988). Assimilation efficiency and growth of nestling insectivores. *Ibis* **130(2)**: 268-274.

Bryant, D.M. & Gardiner, A. (1979). Energetics of growth in House Martins. *J. Zool., London* **189(3)**: 275-304.

Bryant, D.M. & Hails, C.J. (1983). Energetics and growth patterns of three tropical bird species. *Auk* **100(2)**: 425-439.

Bryant, D.M. & Jones, G. (1995). Morphological changes in a population of Sand Martins *Riparia riparia* associated with fluctuations in population size. *Bird Study* **42**: 57-65.

Bryant, D.M. & Turner, A.K. (1982). Central place foraging by swallows (Hirundinidae): the question of load size. *Anim. Behav.* **30**: 845-856.

Bryant, D.M. & Westerterp, K.R. (1980). The energy budget of the House Martin (*Delichon urbica*). *Ardea* **68**: 91-102.

Bryant, D.M. & Westerterp, K.R. (1982). Evidence for individual differences in foraging efficiency amongst breeding birds: a study of House Martins *Delichon urbica* using the doubly labelled water technique. *Ibis* **124(2)**: 187-192.

Bryant, D.M. & Westerterp, K.R. (1983a). Short-term variability in energy turnover by breeding House Martins *Delichon urbica*: a study using doubly-labelled water (D_2O^{18}). *J. Anim. Ecol.* **52**: 525-543.

Bryant, D.M. & Westerterp, K.R. (1983b). Time and energy limits to brood size in House Martins (*Delichon urbica*). *J. Anim. Ecol.* **52**: 905-925.

Bryant, H.B. (1859). A list of birds seen at the Bahamas, from Jan. 20th to May 14th, 1859, with descriptions of new or little known species. *Proc. Boston Soc. Nat. Hist.* **7**: 102-134.

Bryant, H.B. (1867a). Additions to a list of birds seen at the Bahamas. *Proc. Boston Soc. Nat. Hist.* **11**: 63-70.

Bryant, H.B. (1867b). A list of birds of St. Domingo with descriptions of some new species or varieties. *Proc. Boston Soc. Nat. Hist.* **11**: 89-98.

Bub, H. (1952). Baumpieper (*Anthus trivialis*) nistet in neuem Biotop. [Tree Pipit (*Anthus trivialis*) is breeding in new habitat]. *Orn. Mitt.* **4(7)**: 165.

Bub, H. & Herroelen, P. (1981). *Kennzeichen und Mauser Europäischer Singvögel*. Part 1. Lerchen und Schwalben (Alaudidae und Hirundinidae). Neue Brehm-Bücherei **540**. A. Ziemsen Verlag, Wittenberg Lutherstadt, Germany. 122 pp.

Bub, H. & Klings, M. (1968). Ringfunde nord- und westdeutscher Uferschwalben *Riparia riparia*. *Auspicium* **3**: 69-95.

Buchanan, K.L. & Evans, M.R. (2000). The effect of tail streamer length on aerodynamic performance in the Barn Swallow. *Behav. Ecol.* **11**: 228-238.

Bucher, E.H. & Nores, M. (1988). Present status of birds in steppes and savannas of northern and central Argentina. Pp. 71-79 in: Goriup (1988b).

Bucher, E.H., Tamburini, D., Abril, A. & Torres, P. (2003). Folivory in the White-tipped Plantcutter *Phytotoma rutila*: seasonal variations in diet composition and quality. *J. Avian Biol.* **34(2)**: 211-216.

Bucher, T.L. & Worthington, A.H. (1982). Nocturnal hypothermia and oxygen consumption in manakins. *Condor* **84(3)**: 133-139.

Buchweitz, M. (1997). Aussterbender Kulturfolger? - Ein Nachweis der Haubenlerche (*Galerida cristata*) mit Anmerkungen zur Bestandssituation im Landkreis Boblingen. [Is an urban inhabitant dying out? - Record of the Crested Lark (*Galerida cristata*) with notes on its population status in Boblingen District]. *Orn. Schnellmitt. Baden-Württemberg* **55-56**: 28-30.

Buckley, P.A., Foster, M.S., Morton, E.S., Ridgely, R.S. & Buckley, F.G. eds. (1985). *Neotropical Ornithology*. Ornithological Monographs **36**. American Ornithologists' Union, Washington, D.C.

Buden, D.W. (1987a). *The Birds of the Southern Bahamas*. BOU Check-list **8**. British Ornithologists' Union, London.

Buden, D.W. (1987b). The birds of Cat Island, Bahamas. *Wilson Bull.* **99(4)**: 579-600.

Bulgarini, F. & Visentin, M. (1997). Nocturnal feeding by Barn Swallows and House Martins. *British Birds* **90**: 363.

Bull, J. (1964). *Birds of the New York Area*. Harper & Row, New York.

Bull, P.C. (1981). The consequences for wildlife of expanding New Zealand's forest industry. *New Zealand J. Forestry* **26**: 210-231.

Bull, P.C., Gaze, P.D. & Robertson, C.J.R. (1985). *The Atlas of Bird Distribution in New Zealand*. The Ornithological Society of New Zealand, Wellington.

Buller, W.L. (1888). *A History of the Birds of New Zealand*. Vol. 1. 2nd edition. Published privately. London.

Buller, W.L. (1905). *Supplement to the "Birds of New Zealand"*. Vol. 2. Published privately, London.

Bunch, M.C.H. (1964). Nesting of the western Purple Martin. *Murrelet* **45**: 10-11.

Bundy, G. (1976). *The Birds of Libya. An Annotated Check-list*. BOU Check-list **1**. British Ornithologists' Union, London.

Bundy, G. & Morgan, J.H. (1969). Notes on Tripolitanian birds. *Bull. Brit. Orn. Club* **89(5)**: 139-144; **89(6)**: 151-159.

Bundy, G. & Warr, E. (1980). A check-list of the birds of the Arabian Gulf states. *Sandgrouse* **1**: 4-49.

Bunning, L.J. (1998). Communal roosting of Cape Wagtails. *Bokmakierie* **181**: 11.

Burbidge, A.A. (1984). Welcome Swallow survey. *RAOU Newsl.* **61**: 8.

Burbidge, A.A. & Jenkins, R.W.G. eds. (1984). *Endangered Vertebrates of Australia and its Island Territories*. Australian National Parks & Wildlife Service, Canberra.

Burbidge, A.A., Folley, G.L. & Smith, G.T. (1986). *The Noisy Scrub-bird. Western Australian Wildlife Management Program* **2**. Department of Conservation and Land Management, Perth. 27 pp.

Bureš, S. (1992). Food accessibility as a factor determining the foraging strategies in the Grey Wagtail *Motacilla cinerea*. In: *4th International Behav. Ecol. Congress*. Princeton, New Jersey. (Abstract).

Bureš, S. (1993). Food of Water Pipit nestlings *Anthus spinoletta spinoletta* in changing environment. *Folia Zoologica* **42**: 213-219.

Bureš, S. (1994a). Mortality and results of calcium intake experiments in *Anthus pratensis* in polluted and unpolluted areas. *J. Orn.* **135**: 230.

Bureš, S. (1994b). Segregation of diet in Water Pipit (*Anthus spinoletta*) and Meadow Pipit (*Anthus pratensis*) nestlings in an area damaged by air pollution. *Folia Zoologica* **43(1)**: 43-48.

Bureš, S. (1995). Responses of Grey Wagtail *Motacilla cinerea* to changing prey availability during the nestling period. *J. Avian Biol.* **26(4)**: 325-329.

Bureš, S. (1997). High common vole *Microtus arvalis* predation on ground-nesting bird eggs and nestlings. *Ibis* **139(1)**: 173-174.

Bureš, S. & Kral, M. (1987). Diet analysis and trophic ecology of the Grey Wagtail (*Motacilla cinerea* Tunst.) in Nisky Jesenik. *Folia Zoologica* **36(3)**: 257-264.

Bureš, S. & Pavel, V. (1997). The effect of nestling condition on risk-taking in Meadow Pipits. *Anim. Behav.* **54**: 1531-1534.

Bureš, S., Nádvorník, P. & Saetre, G.P. (2002). Hybridization and apparent hybridization between Meadow Pipit (*Anthus pratensis*) and Water Pipit (*A. spinoletta*). *Hereditas* **136(3)**: 254-256.

Bureš, S., Pavel, V., Skrivan, P. & Horackova, K. (1998). Evolutionary aspects of differences in nest defence behaviour in open- and hole-nesting passerines. *Ostrich* **69(3&4)**: 244.

Burger, L. (1990). Rock Pipit sightings. *Lanlarius* **40**: 9-10.

Burgerjon, J.J. (1964). Some census notes on a colony of South African Cliff Swallows, *Petrochelidon spilodera* (Sundevall). *Ostrich* **35**: 77-85.

Burgess, N.D., Cutts, C.J. & Huxham, M. (1991). New records of the Sokoke Pipit *Anthus sokokensis* from Kiono Forest Reserve, Bagamoyo District, northeastern Tanzania. *Scopus* **15**: 56-57.

Burgess, N.D., Huxham, M., Mlingwa, C.O.F., Davies, S.G.F. & Cutts, C.J. (1991). Preliminary assessment of forest birds in Kiono, Pande, Kisiju and Kiwengoma coastal forests, Tanzania. *Scopus* **14**: 97-106.

Burgess, N.D., Mwasumbi, L.B., Hawthorne, W.J., Dickinson, A. & Doggett, R.A. (1992). Preliminary assessment of the distribution, status and biological importance of coastal forests in Tanzania. *Biol. Conserv.* **62**: 205-218.

Burgess, N.M., Hunt, K.A., Bishop, C. & Weseloh, D.V. (1999). Cholinesterase inhibition in Tree Swallows (*Tachycineta bicolor*) and Eastern Bluebirds (*Sialia sialis*) exposed to organophosphorus insecticides in apple orchards in Ontario, Canada. *Environm. Toxicol. Chem.* **18**: 708-716.

Burkmar, R.J. (1988). *The Effects of Upland Pasture Improvement on Breeding Passerine Populations, Particularly Skylarks and Meadow Pipits*. PhD. dissertation, University of Wales, Cardiff.

Burleigh, T.D. (1972). *The Birds of Idaho*. Caxton, Caldwell, Idaho.

Burness, G.P., Ydenberg, R.C. & Hochachka, P.W. (1998). Interindividual variability in body composition and resting oxygen consumption rate in breeding Tree Swallows, *Tachycineta bicolor*. *Physiol. Zool.* **71**: 247-256.

Burns, F.L. (1915). Comparative periods of deposition and incubation of some North American birds. *Wilson Bull.* **27(1)**: 275–286.

Burri, W. (1990). Erste Beobachtung der Stummellerche *Calandrella rufescens* in der Schweiz. *Orn. Beob.* **87(2)**: 169.

Burton, P.J.K. (1971). Sexual size dimorphism in *Alauda razae*. *Bull. Brit. Orn. Club* **91(4)**: 108-109.

Burton, P.J.K. (1973). Composite nest of Short-crested Flycatcher *Myiarchus ferox*. *Bull. Brit. Orn. Club* **93(3)**: 114-115.

Burton, P.J.K. (1976). Structure and histology of the White Bellbird (*Procnias alba*). *J. Zool., London* **178(3)**: 285-293.

Burtt, E.H., Bitterbaum, E.J. & Hailman, J.P. (1988). Head-scratching method in swallows depends on behavioral context. *Wilson Bull.* **100(4)**: 679-682.

Bury, C. & Huin, D. (1998). Nidification de l'Hirondelle rousseline dans le Var, état des connaissances en 1998. *Faune Provence* **19**: 61-64.

Busch, J.D., Miller, M.P., Paxton, E.H., Sogge, M.K. & Keim, P. (2000). Genetic variation in the endangered Southwestern Willow Flycatcher. *Auk* **117(3)**: 586-595.

Busche, G. (1989). Drastische Bestandseinbußen der Feldlerche *Alauda arvensis* auf Grünlandflächen in Schleswig-Holstein. [Population crash of the Skylark *Alaudu arvensis* in the Schleswig-Holstein lowlands]. *Vogelwelt* **110(2)**: 51-59.

Buschendorf, J. (1975). Teilalbinotische Mehlschwalben. *Falke* **22(11)**: 392.

Butler, A.L. (1905). A contribution to the ornithology of the Egyptian Soudan. *Ibis* **Ser. 8, no. 5**: 301-401.

Butler, A.L. (1907). Notes on the Red-tailed Bush-Lark (*Mirafra erythropygia*). *Ibis* **Ser. 9, no. 1**: 467-472.

Butler, A.L. (1908). A second contribution to the ornithology of the Egyptian Soudan. *Ibis* **Ser. 9, no. 2**: 205-263

Butler, R. (1986). The 1986 Birdwatch. *Honeyguide* **32(3/4)**: 120-130.

Butler, R.W. (1982a). Possible use of legs as dissipators of heat in flying Cliff Swallows. *Wilson Bull.* **94(1)**: 87-89.

Butler, R.W. (1982b). Wing fluttering by mud-gathering Cliff Swallows: avoidance of "rape" attempts? *Auk* **99(1)**: 758-761.

Butler, R.W. (1988). Population dynamics and migration routes of Tree Swallows, *Tachycineta bicolor*, in North America. *J. Field Orn.* **59**: 395-402.

Butler, T.Y. (1979). *The Birds of Ecuador and the Galapagos Archipelago*. The Ramphastos Agency, Portsmouth, New Hampshire.

Butlin, R.K. & Neems, R.M. (1994). Hybrid zones and sexual selection. *Sciences* **265(5168)**: 122.

Butynski, T. (1994). The Angola Swallow *Hirundo angolensis* nesting in the Impenetrable Forest, Uganda. *Scopus* **18**: 124-126.

Buxton, E.J.M. (1961). Notes on the incubation of the Grey Wagtail. *British Birds* **54**: 432-433.

Buzzetti, D.R.C. (2000). Distribução altitudinal de aves em Angra dos Reis e Parati, sul do Estado do Rio de Janeiro, Brasil. [Altitudinal distribution of birds in Angra dos Reis and Parati, Rio de Janeiro, Brazil]. Pp. 131-148 in: Alves *et al.* (2000). In Portuguese with English summary.

Buzzetti, D.R.C., Mazar Barnett, J. & Kirwan, G.M. (2003). Kaempfer's Tody-tyrant *Hemitriccus kaempferi*. *Cotinga* **20**: 95-97.

Byaruhanga, A., Kasoma, P. & Pomeroy, D. (2001). *Important Bird Areas in Uganda*. Nature Uganda, Kampala.

Cabanis, J. (1861). Übersicht der im Berliner Museum befindlichen Vögel Von Costa Rica Vom Herausgeber. *J. Orn* **9**: 81-96.

Cabanis, J. & Heine, F. (1859-1860). *Museum Heineanum. Verzeichniss der ornithologischen Sammlung des Oberamtmann Ferdinand Heine auf Gut St. Burchard vor Halberstadt. Mitkritischen Anmerkungen und Beschreibung der neuen Arten systematisch bearbeitet*. Vol. 2. R. Frantz, Halberstadt, Germany.

Cadena, C.D. (2002a). *Pseudocolopteryx acutipennis*. Pp. 333-337 in: Renjifo *et al.* (2002).

Cadena, C.D. (2002b). *Eremophila alpestris*. Pp. 371-374 in: Renjifo *et al.* (2002).

Cadena, C.D. & Renjifo, L.M. (2002). *Muscisaxicola maculirostris*. Pp. 345-348 in: Renjifo *et al.* (2002).

Cadena, C.D., Alvarez, M., Parra, J.L., Jiménez, I., Mejía, C.A., Santamaría, M., Franco, A.M., Botero, C.A., Mejía, G.D., Umaña, A.M., Calixto, A., Aldana, J. & Londoño, G.A. (2000). The birds of CIEM, Tinigua National Park, Colombia: an overview of 13 years of ornithological research. *Cotinga* **13**: 46-54.

Caldwell, H.R. & Caldwell, J.C. (1931). *South China Birds*. Hester May Vanderburgh, Shanghai.

Camargo, H.F.de A. & Camargo, E.A. (1964). Occorencia de *Iodopleura p. pipra* no Estado de São Paulo, Brasil, e algumas notas sobre *Iodopleura isabellae*. *Pap. Dep. Zool. São Paulo* **16**: 45-55.

Campbell, A.G. (1941). Courtship of lyrebird. *Emu* **40**: 357.

Campbell, A.G. & Gray, A. (1942). Lyrebirds of Sherbrooke. *Emu* **42**: 106-111.

Campbell, A.J. (1901). *Nests and Eggs of Australian Birds*. Published privately, Sheffield.

Campbell, B. & Lack, E. eds. (1985). *A Dictionary of Birds*. T. & A.D. Poyser, Calton, UK.

Campbell, H. (1989). Difficult species. 1. Pipits. *Albatross* **300**: 3-5.

Campbell, H. (1990). Addendum to difficult species. 1. Pipits: Buffy Pipit. *Albatross* **301**: 6.

Campbell, L. (1977). Interesting bird recovery - Red-rumped Swallow *Hirundo daurica* recovered after eight years. *Bull. East Afr. Nat. Hist. Soc.* **1977**: 134.

Campbell, L.W. (1936). An unusual colony of Alder Flycatchers. *Wilson Bull.* **48(3)**: 164-168.

Campbell, R.W., Dawe, N.K., McTaggart-Cowan, I., Cooper, J.M., Kaiser, G.W., McNall, M.C.E. & Smith, G.E.J. (1997). *The Birds of British Columbia*. Vol. 3. Flycatchers through Vireos. British Columbia Ministry of Environment, Lands and Parks and Environment Canada, Victoria & Delta, British Columbia.

Campbell, R.W., Van Damme, L.M. & Johnson, S.R. (1997). Sky Lark (*Alauda arvensis*). No. **286** in: Poole & Gill (1997).

Camperi, A.R. (1993). Estudio sobre aves colectadas en el extremo sudoeste de la provincia de Buenos Aires. *Neotrópica* **38(100)**: 127-140.

Camperi, A.R. & Darrieu, C.A. (1995). Distribución geográfica de *Anthus hellmayri brasilianus* en la Argentina (Aves: Motacillidae). *Neotropica (La Plata)* **41(105-106)**: 119-120.

Canaday, C. (2002a). Picochato Goliamarillo. *Platyrinchus flavigularis*. Page 392 in: Granizo (2002).

Canaday, C. (2002b). Frutero Golifuego. *Pipreola chlorolepidota*. Page 397 in: Granizo (2002).

Canaday, C. (2002c). Piha Coligrís. *Lipaugus subalaris*. Page 399 in: Granizo (2002).

Canaday, C. (2002d). Martín Sureño. *Progne elegans*. Page 430 in: Granizo (2002).
Canaday, C. & Jost, L. (1997). *Common Birds of Amazonian Ecuador: a Guide for the Wide-eyed Ecotourist (with Special Reference to the Cuyabeno Reserve)*. Parques Nacionales y Conservación Ambiental **6**. Ediciones Libri Mundi, Quito.
Canevari, M., Canevari, P., Carrizo, G.R., Harris, G., Mata, J.R. & Straneck, R.J. (1991). *Nueva Guía de las Aves Argentinas*. Vols. 1-2. Fundación Acindar, Buenos Aires.
Cannell, I.C. (1968). Notes from Angola. *Ostrich* **39**: 264-265.
Cannings, R.J. (1981). Notes on the nesting of Horned Larks on the Chilcotin Plateau of British Columbia. *Murrelet* **62(1)**: 21-23.
Cannings, R.J. & Threlfall, W. (1981). Horned Lark breeding biology at Cape St. Mary's, Newfoundland. *Wilson Bull.* **93(4)**: 519-530.
Cañadas, S., Castro, H., Manrique, J. & Miralles, J.M. (1982). Aportaciones al conocimiento de la estepa litoral almeriense. *Paralelo 37°* **6**: 93-104.
Cañadas, S., Castro, H., Manrique, J. & Miralles, J.M. (1988). Datos sobre la reproducción de la Alondra de Dupont (*Chersophilus duponti*) en Almería. *Ardeola* **35(1)**: 158-162
Cañadas, S., Castro, H., Manrique, J. & Miralles, J.M. (1989). Nidificación de la Alondra de Dupont (*Chersophilus duponti*) en Almería. Contribución al conocimiento de la fenología reproductora. *Bol. Inst. Est. Almer.* **1988**: 309-317.
Capparella, A.P. (1988). Genetic variation in Neotropical birds: implications for the speciation process. Pp. 1658-1664 in: Ouellet (1988).
Capper, D.R., Clay, R.P. & Lowen, J.C. (1998). Neotropical Notebook. Recent sightings of threatened birds around Corcovado National Park, Costa Rica. *Cotinga* **10**: 87-90.
Capper, D.R., Clay, R.P., Madroño, A., Mazar Barnett, J., Burfield, E.J., Esquivel, E.Z., Kennedy, C.P., Perrens, M. & Pople, R.G. (2001). First records, noteworthy observations and new distributional data for birds in Paraguay. *Bull. Brit. Orn. Club* **121(1)**: 23-37.
Capper, D.R., Esquivel, E.Z., Pople, R.G., Burfield, I.J., Clay, R.P., Kennedy, C.P. & Mazar Barnett, J. (2000). Surveys and recommendations for the management of Aguará Ñu in the Reserva Natural del Bosque Mbaracayú, eastern Paraguay. Unpublished report.
Capreol, M. (1983). *The Adaptive Significance of the Feather Lining in the Tree Swallow (*Tachycineta bicolor*) Nest and its Effect on Reproductive Success*. Bsc thesis, Queen's University, Kingston, Canada.
Cardiff, S.W. (1983). Three new bird species for Peru, with other distributional records from northern Departamento de Loreto. *Gerfaut* **73(2)**: 185-192.
Cardiff, S.W. & Dittmann, D.L. (2000). Brown-crested Flycatcher (*Myiarchus tyrannulus*). No. **496** in: Poole & Gill (2000a).
Cardiff, S.W. & Dittmann, D.L. (2002). Ash-throated Flycatcher (*Myiarchus cinerascens*). No. **664** in: Poole, A.F. & Gill, F.B. eds. (2002). *The Birds of North America*. Vol. 17. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Cardwell, P. & Dunning, J. (1971). The mimicking ability of the Clapper Lark. *Witwatersrand Bird Club News* **76**: 1.
Carey, G.J. (1989). The identification of Pechora Pipit and its status in Hong Kong. *Hong Kong Bird Rep.* **1989**: 109-115. In English with Chinese summary.
Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M. & Young, L. (2001). *The Avifauna of Hong Kong*. Hong Kong Birdwatching Society, Hong Kong.
de Carli, E., Fornasari, L., Bani, L. & Bottoni, L. (1998). Trend in distribution, abundance and habitat features of Skylark (*Alauda arvensis*) in northern Italy. *Gibier Faune Sauvage* **15(2)**: 387-396.
de Carmen, S.M. & Fjeldså, J. (1999). Apéndice 3. Aves del área de La Morada. Pp. 118-122 in: Schjellerup, I., Espinoza, C., Quipuscoa, S.V. & del Carmen, S.M. eds. (1999). *La Morada. La Gente y la Biodiversidad*. Centre for Research on Cultural and Biological Diversity of Andean Rainforest (DIVA), Rønde, Denmark.
Carmichael, G.G. (1995). The Superb Lyrebird *Menura novaehollandiae* in Sherbrooke Forest: a comment on Smith (1994). *Austr. Bird Watcher* **16(2)**: 84-85.
Carmichael, G.G. (1998). Superb Lyrebird *Menura novaehollandiae* nesting in Sherbrooke Forest, 1974 to 1996. *Austr. Bird Watcher* **17(6)**: 290-296.
Carothers, S.W. (1974). *Breeding Ecology and Time-energy Budget of Male Vermilion Flycatchers and Comments on the Social Organization of Southwestern Riparian Birds*. PhD dissertation, University of Illinois, Chicago, Illinois.
Carr, B.A. (1984). Nest eviction of Rock Martins by Little Swifts. *Ostrich* **55**: 223-224.
Carrera, L. (2003). Bisbita Común *Anthus pratensis*. Pp. 618-619 in: Martí & del Moral (2003).
Carriker, M.A. (1910). *An Annotated List of the Birds of Costa Rica, Including Cocos Island*. Annals of the Carnegie Museum **6**. 601 pp.
Carriker, M.A. (1933). Descriptions of new birds from Peru, with notes on other little-known species. *Proc. Acad. Nat. Sci. Philadelphia* **85**: 1-38.
Carriker, M.A. (1935). Descriptions of new birds from Bolivia, with notes on other little-known species. *Proc. Acad. Nat. Sci. Philadelphia* **87**: 313-341.
Carriker, M.A. (1954). Additions to the avifauna of Colombia. *Noved. Colombianas* **1**: 14-19.
Carriker, M.A. (1955). Notes on the occurrence and distribution of certain species of Colombian birds. *Noved. Colombianas* **2**: 48-64.
Carriker, M.A. (1959). New records of rare birds from Nariño and Cauca and notes on others. *Noved. Colombianas* **1(4)**: 196-199.
Carrión, B. & Sibley, F.C. (1992). New distributional records for Ecuadorian birds. *Orn. Neotropical* **3**: 27-34.
Carroll, R.W. (1988). Birds of the Central African Republic. *Malimbus* **10(2)**: 177-200.
Carter, M. (2000). Identification of Red-rumped and Striated Swallows *Hirundo daurica* and *H. striolata* in Australasia. *Austr. Birding Mag.* **6(2)**: 9-18.
Carter, M. (2003). Pechora Pipit *Anthus gustavi* in Australia. *Austr. Field Orn.* **20(2)**: 59-65.
Carter, M., Farnes, R. & Pamment, N. (1995). White Wagtails *Motacilla alba* in Victoria. *Austr. Bird Watcher* **16(1)**: 21-33.
Carter, M., Fenwick, G., Hunter, C., Pashley, D. & Petit, D. (1996). *For the Future: Watchlist 1996*. Audubon Field Notes **50(3)**.
Casañas, H.E. (1997). Sobre la presencia de la Cachirla Pálida *Anthus hellmayri* en la provincia de Córdoba, Argentina. [Hellmayr's Pipit in Córdoba, Argentina Province]. *Hornero* **14(4)**: 270-273. In Spanish with English summary.
Casas, A.E., García, A.T. & de la Peña, M.R. (1990). Contribución al conocimiento del nido de *Ochthoeca parvirostris*. *Hornero* **13**: 159-160.
Casselton, P.J. (1984). Breeding birds. Pp. 229-240 in: Cloudsley-Thompson, J.L. ed. (1984). *Key Environments: Sahara Desert*. Pergamon Press, Oxford.
Cassidy, J. ed. (1990). *Book of North American Birds*. Reader's Digest, Pleasantville, New York.
Castelino, M.A. & Saibene, C.A. (1989). Nidificación de aves en Misiones. *Nuestra Aves* **20**: 7-9.
Castell, P. (1996a). Incubation period and nestlings of Dupont's Lark. *British Birds* **89(8)**: 363.
Castell, P. (1996b). Nestlings of Bimaculated Lark. *British Birds* **89(8)**: 363.
Castell, P. (1999). Notes on the breeding biology of Raso Lark *Alauda razae*. *Bull. African Bird Club* **6**: 103-106.
Castell, P. (2000). Notes on the breeding biology of several species in north-west Africa. *Bull. African Bird Club* **7(2)**: 104-106.
Castell, P., Coburn, J., Pleasance, B., Quittenden, T. & Shobrack, M. (2002). Further notes on the breeding biology of some birds in Saudi Arabia. *Sandgrouse* **24(1)**: 33-37.
Casto, S.D. (1998). Winter mortality of Cave Swallows in South Texas. *Bull. Texas Orn. Soc.* **31**: 30-31.
Castralle, J.S. (1982). Effects of two sagebrush control methods on nongame birds. *J. Wildl. Manage.* **46**: 945-952.
Castralle, J.S. (1983). Selection of song perches by sagebrush-grassland birds. *Wilson Bull.* **95(4)**: 647-655.
Castro Astor, I.N., Alves, M.A.S. & Cavalcanti, R.B. (2004). Display behavior and spatial distribution of the Red-headed Manakin in the Atlantic forest of Brazil. *Condor* **106(2)**: 320-335.
Castro Astor, I.N., Cavalcanti, R.B. & Alves, M.A.S. (1998). Spatial distribution and display behaviour of sympatric manakins in the Atlantic forest of Brazil. Proceedings of the XXII International Ornithological Congress, Durban 1998. *Ostrich* **69(3&4)**: 375. (Abstract).
Castro, I. & Phillips, A. (1996). *A Guide to the Birds of the Galápagos Islands*. Christopher Helm, London.
Cater, M.B. (1944). Roosting habits of martins at Tucson, Arizona. *Condor* **46(1)**: 15-18.
Catry, P. & Mendes, L. (1998). Red-throated Pipit *Anthus cervinus* and Icterine Warbler *Hippolais icterinus*, new to Guinea-Bissau. *Malimbus* **20(2)**: 123-124.
Catzeflis, F. (1978). Sur la biologie de reproduction du Pipit spioncelle alpin. *Nos Oiseaux* **34(7)**: 287-302.
Caughley, G. & Challies, C.N. (1960). Riflemen in exotic pine-forests. *Notornis* **9(2)**: 63.
Cavalcanti, R.B. (1988). Conservation of birds in the *cerrado* of central Brazil. Pp. 59-66 in: Goriup (1988b).
Cavalcanti, R.B. (1999). Bird species richness and conservation in the Cerrado region of central Brazil. *Stud. Avian Biol.* **19**: 244-249.
Cave, F.O. & Macdonald, J.D. (1955). *Birds of the Sudan: their Identification and Distribution*. Oliver & Boyd, Edinburgh & London.
Cawkell, E.M. & Hamilton, J.E. (1961). The birds of the Falkland Islands. *Ibis* **103A**: 1-27.
Ceballos, G. & Valdelamar, L.M. eds. (2000). *Las Aves de México en Peligro de Extinción*. Universidad Nacional Autónoma de México, CONABIO & Fondo de Cultura Económica, México, D.F.
Celis-Díez, J.L. (2002). Consumo de néctar de *Grevillea robusta* por Fío-Fío (*Elaenia albiceps*) en parques de Santiago. *Bol. Chileno Orn.* **9**: 25-26.
Černy, V. (1988). The feather mites of the family *Proctophyllodidae* (Acari, Sarcoptiformes) from Nepalese birds. *Folia Parasitol.* **35(3)**: 253-258.
Chace, J.F. & Tweit, R.C. (1999). Greater Pewee (*Contopus pertinax*). No. **450** in: Poole & Gill (1999).
Chace, J.F., Cruz, A. & Cruz, A. (1997). Nesting success of the Western Wood-pewee in Colorado. *Western Birds* **28(2)**: 110-112.
Chakravarthy, A.K. & Tejasvi, K.P.P.C. (1992). *Birds of Hill Region of Karnataka: an Introduction*. Navbharath Enterprises, Bangalore, India.
Chalmers, M.L. (1991). Northern Skylark – the first record for Hong Kong. *Hong Kong Bird Rep.* **1991**: 112–115.
Chamberlain, D.E. (2001). Habitat associations and trends in reproductive performance of Skylarks *Alauda arvensis* breeding in the uplands of the UK. Pp. 25-39 in: Donald & Vickery (2001).
Chamberlain, D.E. & Crick, H.Q.P. (1999). Population declines and reproductive performance of Skylarks *Alauda arvensis* in different regions and habitats of the United Kingdom. *Ibis* **141(1)**: 38-51.
Chamberlain, D.E. & Gregory, R.D. (1999). Coarse and fine scale habitat associations of breeding Skylarks *Alauda arvensis* in the UK. *Bird Study* **46(1)**: 34-47.
Chamberlain, D.E. & Siriwardena, G.M. (2000). The effects of agricultural intensification on Skylarks (*Alauda arvensis*): evidence from monitoring studies in Great Britain. *Environm. Rev.* **8(2)**: 95-113.
Chamberlain, D.E. & Vickery, J.A. (2002). Declining farmland birds: evidence from large-scale monitoring studies in the UK. *British Birds* **95(6)**: 300-310.
Chamberlain, D.E., Vickery, J.A. & Gough, S. (2000). Spatial and temporal distribution of breeding Skylarks *Alauda arvensis* in relation to crop type in periods of population increase and decrease. *Ardea* **88(1)**: 61-73.
Chamberlain, D.E., Wilson, A.M., Browne, S.J. & Vickery, J.A. (1999). Effects of habitat type and management on the abundance of Skylarks in the breeding season. *J. Appl. Ecol.* **36(6)**: 856-870.
Chambers, L. (1995). Purple Martin die-offs during the summer of 1995. *Purple Martin Update* **6(2)**: 24-25.
Chambers, S. (2000). *Birds of New Zealand. Locality Guide*. Arun Books, Hamilton.
Chan, K. (2001). Partial migration in Australian landbirds: a review. *Emu* **101(4)**: 281-292.
Chanda, S. (1998). Courtship display of Large Pied Wagtail *Motacilla maderaspatensis* in Kokrajhar, Assam. *Newsl. Birdwatchers* **38**: 88.
Chandler, R.M. & Martin, L.D. (1988). Illinoian age fossil birds of eastern Nebraska. *Curr. Res. Pleist.* **5**: 64-65.
Chapa, L. (1998). Effects of corridor width on the abundance and nesting success of Acadian Flycatchers in southern Illinois, USA. Page 44 in: Anon. (1998b). (Abstract).
Chapin, J.P. (1925). A new swallow from Cameroon. *Ibis* **Ser. 12, no. 1**: 148-151.
Chapin, J.P. (1948). Field notes on *Petrochelidon fuliginosa*. *Ibis* **90(3)**: 474-476.
Chapin, J.P. (1953). *The Birds of the Belgian Congo*. Part 3. Bulletin of the American Museum of Natural History **75A**, New York. 821 pp.
Chapin, J.P. (1954). The African River Martin and its migration. *Ann. Mus. Congo Tervuren, Zool.* **1**: 9-15.
Chaplin, S.B., Cervenka, M.L. & Mickelson, A.C. (2002). Thermal environment of the nest during development of Tree Swallow (*Tachycineta bicolor*) chicks. *Auk* **119(3)**: 845-851.
Chapman, B.R. & George, J.E. (1991). The effect of ectoparasites on Cliff Swallow growth and survival. Pp. 69-92 in: Loye & Zuk (1991).
Chapman, F.M. (1888). List of additions to the North American avifauna and of eliminations and changes in nomenclature proposed since the publication of the AOU checklist. *Auk* **5(4)**: 393-402.
Chapman, F.M. (1894). *On the Birds of the Island of Trinidad*. Bulletin of the American Museum of Natural History **6**. New York. 86 pp.
Chapman, F.M. (1896). Notes on birds observed in Yucatan. *Bull. Amer. Mus. Nat. Hist.* **8(18)**: 603-637.
Chapman, F.M. (1914). Diagnoses of apparently new Colombian birds. Part III. *Bull. Amer. Mus. Nat. Hist.* **33(40)**: 603-637.
Chapman, F.M. (1915). Diagnoses of apparently new Colombian birds. Part IV. *Bull. Amer. Mus. Nat. Hist.* **34(23)**: 635-662.
Chapman, F.M. (1917a). *Birdlife in Colombia*. American Museum of Natural History, New York.
Chapman, F.M. (1917b). *Birdlife in Ecuador*. American Museum of Natural History, New York.
Chapman, F.M. (1917c). *The Distribution of Bird-life in Colombia: a Contribution to a Biological Survey of South America*. Bulletin of the American Museum of Natural History **36**, New York. 729 pp.
Chapman, F.M. (1921). *The Distribution of Bird Life in the Urubamba Valley of Peru*. Smithsonian Institution Bulletin **117**, Smithsonian Institution, Washington D.C. 138 pp.
Chapman, F.M. (1926). *The Distribution of Bird-life in Ecuador: a Contribution to a Study of the Origin of Andean Bird-life*. Bulletin of the American Museum of Natural History **55**, New York. 784 pp.
Chapman, F.M. (1929a). *My Tropical Air Castle: Nature Studies in Panama*. Appleton & Co., New York.
Chapman, F.M. (1929b). Relationships of the races of *Phaeoprogne tapera* and their probable significance. *Auk* **46(3)**: 348-357.
Chapman, F.M. (1931). *The Upper Zonal Bird-life of Mts. Roraima and Duida*. Bulletin of the American Museum of Natural History **63(1)**, New York. 135 pp.
Chapman, F.M. (1935). The courtship of Gould's Manakin (*Manacus vitellinus vitellinus*) on Barro Colorado Island, Canal Zone. *Bull. Amer. Mus. Nat. Hist.* **68**: 471-525.
Chapman, F.M. (1939). The riddle of *Oxyruncus*. *Amer. Mus. Novit.* **1047**: 1-4.
Charlez, A. (1990). La chasse traditionnelle de l'alouette. *Bull. Mens. ONC* **147**: 2-3.
Charron, F. (1987). Intérêt de la stéréophonie pour l'étude sur le terrain: le Sirli de Dupont *Chersophilus duponti*. *Alauda* **55(4)**: 303.
Chaves, J., Arévalo, J.E. & Araya, M. (2003). Altitudinal movements and conservation of Bare-necked Umbrellabird *Cephalopterus glabricollis* of the Tilarán Mountains, Costa Rica. *Bird. Conserv. Int.* **13(1)**: 45-58.
Chaves, L. (2001). Observations on diet, foraging behaviour, vocalisations and displays of Spangled Cotinga *Cotinga cayana*. *Cotinga* **16**: 103-104.
Chebez, J.C. (1994). *Los Que se Van. Especies Argentinas en Peligro*. Albatros, Buenos Aires.
Chebez, J.C. & Bertonatti, C.C. (1994). *La Avifauna de la Isla de los Estados, Islas de Año Nuevo y Mar Circundante (Tierra del Fuego, Argentina)*. Literature of Latin America, Buenos Aires.
Chebez, J.C., Rey, N.R., Barbaskas, M. & Di Giacomo, A.G. (1999). *Las Aves de los Parques Nacionales de la Argentina*. Literature of Latin America, Buenos Aires.
Chek, A. & Robertson, R.J. (1991). Infanticide in female Tree Swallows: a role for sexual selection. *Condor* **93(2)**: 454-457.
Chek, A. & Robertson, R.J. (1994). Weak mate guarding in Tree Swallows: ecological constraint or female control? *Ethology* **98**: 1-13.
Cheke, A.S. (1987a). The ecology of the smaller land birds of Mauritius. Pp. 151-207 in: Diamond (1987).
Cheke, A.S. (1987b). The ecology of the surviving land birds of Réunion. Pp. 301-358 in: Diamond (1987).
Cheke, R.A. & Walsh, J.F. (1996). *The Birds of Togo. An Annotated Check-list*. BOU Check-list **14**. British Ornithologists' Union, Tring, UK.
Chemyakin, R.G. (1988). [Sex ratio in passeriformes by the data of catchings]. *Zoologischeskii Zhurnal* **67(7)**: 1046-1055. In Russian with English summary.
Chen Linna & Shi Yonggang (1981). Rearing of the Tree Sparrow, *Passer montanus* by the Crested Lark, *Galerida cristata*. *Biol. Sci. Shanxi (Zool.)*: 88-90.
Chen Linna & Shi Yonggang (1982). [Observations on hatching and rearing of sparrows by the Crested Lark *Galerida cristata*]. *Chinese J. Zool.* **17(5)**: 64. In Chinese.
Chen Zuoping & Zhang Weigong (1985). [Preliminary observations on the breeding and the home range of Lesser Sand Lark]. *Chinese J. Zool.* **20(1)**: 15-17. In Chinese.
Cheng Tsohsin ed. (1964). *China's Economic Fauna: Birds*. English translation by Office of Technical Services, Joint Publications Research Service, Washington, D.C.
Cheng Tsohsin (1987). *A Synopsis of the Avifauna of China*. Science Press, Beijing, China.
Cheng Tsohsin (2002). *The Keys to the Birds of China*. 3rd edition. Science Press, Beijing, China.

Cherrie, G.K. (1916). *A Contribution to the Ornithology of the Orinoco Region*. Museum of the Brooklyn Institute of Arts and Sciences Bulletin **2(6)**. 242 pp.
Cheskey, T. (1987). Olive-sided Flycatcher. Pp. 250–251 in: Cadman, M.D., Eagles, P.F.J. & Helleiner, F.M. eds. (1987). *Atlas of the Breeding Birds of Ontario*. University of Waterloo Press. Waterloo, Ontario.
Chesser, R.T. (1994) Migration in South America, an overview of the austral system. *Bird Conserv. Int.* **4**: 91–107.
Chesser, R.T. (1995). *Biogeographic, Ecological, and Evolutionary Aspects of South American Austral Migration, with Special Reference to the Family Tyrannidae*. PhD dissertation, Louisiana State University, Baton Rouge, Louisiana.
Chesser, R.T. (1996). The juvenal plumage of *Muscisaxicola albifrons*. *Orn. Neotropical* **7**: 185-186.
Chesser, R.T. (1997). Patterns of seasonal and geographical distribution of austral migrant flycatchers (Tyrannidae) in Bolivia. Pp. 171-204 in: Remsen (1997).
Chesser, R.T. (2000). The phylogenetics of *Muscisaxicola* ground-tyrants. *Mol. Phylogen. Evol.* **15**: 369-380.
Chesser, R.T. & Marín, M. (1994). Seasonal distribution and natural history of the Patagonian Tyrant (*Colorhamphus parvirostris*). *Wilson Bull.* **106(4)**: 649-667.
Cheylan, G. (1999). Alouette calandre *Melanocorypha calandra*. Pp. 90-91 in: Rocamora & Yeatman-Berthelot (1999).
Cheylan, G., Bence, P., Boutin, J., Dhermain, F., Olioso, G. & Vidal, P. (1983). L'utilisation du milieu par les oiseaux de la Crau. *Biologie-Écologie Méditerranéenne* **10(1-2)**: 83-106.
Child, P. (1970). Altitudinal range of the Rock Wren. *Notornis* **17(1)**: 55.
Child, P. (1978). Fluctuations in birdlife in a subalpine basin. *Notornis* **25(1)**: 71-83.
Child, P. (1982). Far-inland sighting of a Welcome Swallow. *Notornis* **29(1)**: 40.
Chisholm, A.H. (1921). Adventures among *Atrichornis*. *Emu* **21**: 2-8.
Chisholm, A.H. (1951). The story of the scrub-birds. *Emu* **51**: 88-112, 258-297.
Chisholm, A.H. (1957). The Albert Lyrebird - a puzzle in distribution. *Emu* **57**: 25-30.
Chisholm, A.H. (1960). *The Romance of the Lyrebird*. Angus & Robertson, Melbourne.
Chisholm, A.H. & Davies, S.J.J.F. (1988). Scrub-birds. Pp. 2585-2586 in: *Australian Encyclopedia*. Vol. 7. 5th edition.
Chittenden, H.N. (1994). Managing Blue Swallows. *Birding in SA* **46**: 63.
Chittenden, H.N. & Batchelor, G.R. (1977). Nesting habits of the Chestnut-backed Finchlark. *Ostrich* **48(3&4)**: 112.
Choate, T. (1975). The predator and the prey no. 7 - montane grassland. *Wild Rhodesia* **7**: 34-35.
Christen, W. (1983). Kurzzehenlerchen *Calandrella brachydactyla* bei Grenchen SO. *Orn. Beob.* **80(3)**: 210.
Christen, W. (2001). Erste Bruten der Felsenschwalbe *Ptyonoprogne rupestris* in den Städten Bern und Grenchen. *Orn. Beob.* **98(1)**: 67-71.
Christen, W. (2003). Frühe Brut der Felsenschwalbe *Ptyonoprogne rupestris* bei Grenchen. *Orn. Beob.* **100(1)**: 87-88.
Christen, W. & Jenny, M. (1983). Dritter und vierter Nachweis der Kalanderlerche *Melanocorypha calandra* für die Schweiz. *Orn. Beob.* **80(4)**: 299-300.
Christian, D.G. (2001). Nests and nesting behaviour of some little known Panamanian birds. *Orn. Neotropical* **12(4)**: 327-336.
Christidis, L. & Boles, W.E. (1994). *The Taxonomy and Species of Birds of Australia and its Territories*. RAOU Monograph 2. Royal Australasian Ornithologists' Union. Melbourne. 112 pp.
Christidis, L. & Schodde, R. (1991). Relationships of Australo-Papuan songbirds - protein evidence. *Ibis* **133(3)**: 277-285.
Christidis, L., Norman, J.A., Scott, I.A.W. & Westerman, M. (1996). Molecular perspectives on the phylogenetic affinities of lyrebirds (Menuridae) and treecreepers (Climacteridae). *Austr. J. Zool.* **44(3)**: 215-222.
Christie, P., de Lope, F., González, G., Saino, N. & Møller, A.P. (2001). The influence of environmental conditions and ectoparasites on immune responses, morphology and recapture probability of nestling House Martins (*Delichon urbica*). *Oecologia* **126(3)**: 333-338.
Christie, P., Møller, A.P. & de Lope, F. (1998). Immunocompetence and nestling survival in the House Martin: the tasty chick hypothesis. *Oikos* **83**: 175-179.
Christie, P., Møller, A.P., Saino, N. & de Lope, F. (2000). Genetic and environmental components of pheotypic variation in immune response and body size of a colonial bird, *Delichon urbica* (the House Martin). *Heredity* **85**: 75-83.
Christy, P. (1984). L'Hirondelle des rochers d'Angola (*Petrochelidon rufigula*) au Gabon. [The Red-throated Cliff Swallow (*Petrochelidon rufigula*) in Gabon]. *Oiseau* **54**: 362-363.
Christy, P. & Clarke, W. (1994). *Guide des Oiseaux de la Réserve de la Lopé*. ECOFAC Gabon, Libreville.
Christy, P. & Clarke, W. (1998). *Guide des Oiseaux de São Tomé et Príncipe*. ECOFAC, São Tomé.
Chu Yinan (1989). An ecological study on the breeding of the northeastern subspecies of Skylarks *Alauda arvensis*. *Chinese Wildlife* **6**: 66-69.
Chu Yinan & Li Jun (1987). Ecological observations on *Alauda arvensis intermedia*. *Chinese Wildlife* **5**: 24-25.
Chubb, C. (1919). New forms of South-American birds. *Ann. Mag. Nat. Hist.* **Ser. 9, no. 4**: 301-304.
Chytil, J. (1991). Crested Larks nesting on roofs. *British Birds* **84(2)**: 62-64.
Cicero, C. & Johnson, N.K. (2002). Phylogeny and character evolution in the *Empidonax* group of tyrant flycatchers (Aves: Tyrannidae): a test of W.E. Lanyon's hypothesis using mtDNA sequences. *Mol. Phylogen. Evol.* **22(2)**: 289-302.
Cintra, R. (1997). Spatial distribution and foraging tactics of tyrant flycatchers in two habitats in the Brazilian Amazon. *Stud. Neotrop. Fauna Environm.* **32(1)**: 17-27.
Cintra, R. & Yamashita, C. (1990). Habitats, abundância e ocurrência das espécies de aves do Pantanal de Poconé, Mato Grosso, Brasil. *Pap. Avuls. Zool.* **37**: 1-21.
Claasen, J. (1991). Perelborsswaelnes met 6 eiers. *Promerops* **197**: 11.
Clancey, P.A. (1948). Notes on birds of the West Palearctic region. Nos. 16-18. *Bull. Brit. Orn. Club* **68**: 596-598.
Clancey, P.A. (1950). Comments on the indigenous races of *Delichon urbica* (L.) occurring in Europe and North Africa. *Bonn. Zool. Beitr.* **1**: 39-42.
Clancey, P.A. (1952a). Three new races of South African birds. *Bonn. Zool. Beitr.* **3(1/2)**: 17-22.
Clancey, P.A. (1952b). Miscellaneous taxonomic notes on African birds. II. The subspecific status of the Great Rift (Kenya Colony) populations of *Calandrella cinerea* (Gmelin). *Durban Mus. Novit.* **4(3)**: 45-49.
Clancey, P.A. (1952c). Miscellaneous taxonomic notes on African birds. II. A new geographical race of the Orange-throated Long-claw *Macronyx capensis* (Linnaeus) from southern Rhodesia. *Durban Mus. Novit.* **4(3)**: 51-54.
Clancey, P.A. (1954). Miscellaneous taxonomic notes on African birds. V. A revision of the South African races of Richard's Pipit *Anthus richardi* Vieillot. *Durban Mus. Novit.* **4(9)**: 101-115.
Clancey, P.A. (1956a). Miscellaneous taxonomic notes on African birds. VII. A new race of *Mirafra africana* (Smith) from Nyasaland. *Durban Mus. Novit.* **4(17)**: 282-284.
Clancey, P.A. (1956b). Miscellaneous taxonomic notes on African birds. VII. The South African races of the Long-billed Pipit *Anthus similis* Jerdon. *Durban Mus. Novit.* **4(17)**: 284-288.
Clancey, P.A. (1957). On the range and status of *Certhilauda falcirostris* Reichenow, 1916: Port Nolloth, N.W. Cape. *Bull. Brit. Orn. Club* **77(8)**: 133-137.
Clancey, P.A. (1958a). Miscellaneous taxonomic notes on African birds. XI. On the races of the Rufous-naped Lark *Mirafra africana* Smith occurring in Natal and Zululand. *Durban Mus. Novit.* **5(10)**: 118-122.
Clancey, P.A. (1958b). Miscellaneous taxonomic notes on African birds. XI. The range of *Anthus leucophrys enunciator* Clancey, 1952. *Durban Mus. Novit.* **5(10)**: 122-123.
Clancey, P.A. (1959a). Miscellaneous taxonomic notes on African birds. XIV. On the range and validity of *Anthus lineiventris stygium* Clancey, 1952. *Durban Mus. Novit.* **5(18)**: 247-248.
Clancey, P.A. (1959b). Miscellaneous taxonomic notes on African birds. XIV. On the range of *Macronyx capensis stabilior* Clancey, 1952. *Durban Mus. Novit.* **5(18)**: 248-250.
Clancey, P.A. (1960a). Local migration problems. *Albatross* **66**: 3-4.
Clancey, P.A. (1960b). On the South African record of the Golden Pipit *Tmetothylacus tenellus* (Cabanis). *Ostrich* **31**: 176.
Clancey, P.A. (1961). Further comments on the taxonomy of the British *Anthus pratensis* (Linnaeus). *Bull. Brit. Orn. Club* **81(8)**: 147-148.
Clancey, P.A. (1962). Miscellaneous taxonomic notes on African birds. XIX. On the name of the Lake Dow, Bechuanaland, form of *Certhilauda albofasciata* Lafresnaye. *Durban Mus. Novit.* **6(15)**: 185-186.
Clancey, P.A. (1963). Miscellaneous taxonomic notes on African birds. XX. Notes, mainly systematic, on some birds from the Cape Province. *Durban Mus. Novit.* **6(19)**: 244-264.
Clancey, P.A. (1964a). Miscellaneous taxonomic notes on African birds. XXII. On the South African races of the Long-billed Pipit *Anthus similis* Jerdon. *Durban Mus. Novit.* **7(7)**: 177-182.
Clancey, P.A. (1964b). *The Birds of Natal and Zululand*. Oliver & Boyd, Edinburgh & London.
Clancey, P.A. (1966a). Subspeciation in the southern African populations of the Sabota Lark *Mirafra sabota* Smith. *Ostrich* **37**: 207-213.
Clancey, P.A. (1966b). A subspecific arrangement of the austral populations of the Fawn-coloured Lark, *Mirafra africanoides* Smith. *Arnoldia, Rhodesia* **2(20)**: 1-8.
Clancey, P.A. (1966c). The South African races of the Banded Sand Martin *Riparia cincta* (Boddaert). *Durban Mus. Novit.* **8(3)**: 25-33.
Clancey, P.A. (1967a). Miscellaneous taxonomic notes on African birds. XXV. Formal descriptions of four new races of African birds. *Durban Mus. Novit.* **8(10)**: 109-114.
Clancey, P.A. (1967b). Subspecific variation in *Macronyx ameliae* de Tarragon. *Bull. Brit. Orn. Club* **87(1)**: 10-13.
Clancey, P.A. (1968a). Miscellaneous taxonomic notes on African birds. XXVI. Interesting distributional records from Moçambique south of the Zambezi R. *Durban Mus. Novit.* **8(13)**: 193-198.
Clancey, P.A. (1968b). Subspeciation in some birds from Rhodesia. Part 2. *Durban Mus. Novit.* **8(12)**: 153-182.
Clancey, P.A. (1968c). Seasonal movement and variation in the southern populations of the Dusky Lark *Pinarocorys nigricans* (Sundevall). *Bull. Brit. Orn. Club* **88(9)**: 166-171.
Clancey, P.A. (1969a). Miscellaneous taxonomic notes on African birds. XXVII. Systematic and distributional notes on Moçambique birds. *Durban Mus. Novit.* **8(15)**: 243-274.
Clancey, P.A. (1969b). Miscellaneous taxonomic notes on African birds. XXVII. The Angolan races of *Eremopterix verticalis* (Smith). *Durban Mus. Novit.* **8(15)**: 228-231.
Clancey, P.A. (1970). Miscellaneous taxonomic notes on African birds. XXVIII. The races of the European Swallow wintering in southern and eastern Africa. *Durban Mus. Novit.* **8(17)**: 325-331.
Clancey, P.A. (1971). Miscellaneous taxonomic notes on African birds. XXXIII. A new flood-plain race of the Red-capped Lark *Calandrella cinerea* (Gmelin) from southern Moçambique. *Durban Mus. Novit.* **9(9)**: 120-122.
Clancey, P.A. (1972). Miscellaneous taxonomic notes on African birds. XXXV. An undescribed race of the Pink-billed Lark *Calandrella conirostris* (Sundevall) from the Transvaal. *Durban Mus. Novit.* **9(16)**: 233-236.
Clancey, P.A. (1977a). Miscellaneous taxonomic notes on African birds. L. The southern African races of the Red-capped Lark *Calandrella cinerea* (Gmelin). *Durban Mus. Novit.* **11(14)**: 252-258.
Clancey, P.A. (1977b). Miscellaneous taxonomic notes on African birds. L. On the southern limits of *Anthus novaeseelandiae lichenya* Vincent, 1933. *Durban Mus. Novit.* **11(14)**: 263-264.
Clancey, P.A. (1978a). The southern African races of the Redcapped Lark *Calandrella cinerea* (Gmelin). *Durban Mus. Novit.* **11**: 252-258.
Clancey, P.A. (1978b). Miscellaneous taxonomic notes on African birds. LI. The tropical African races of the Red-capped Lark *Calandrella cinerea* (Gmelin). *Durban Mus. Novit.* **11(16)**: 281-286.
Clancey, P.A. (1978c). On some enigmatic pipits associated with *Anthus novaeseelandiae* (Gmelin) from central and southern Africa (Aves, Motacillidae). *Bonn. Zool. Beitr.* **29(1-3)**: 148-164.
Clancey, P.A. (1979). Miscellaneous taxonomic notes on African birds. LIV. The subspecies of the Striped Pipit *Anthus lineiventris* Sundevall. *Durban Mus. Novit.* **12(4)**: 42-43.
Clancey, P.A. ed. (1980). *SAOS Checklist of Southern African Birds*. Southern African Ornithological Society. Johannesburg.
Clancey, P.A. (1982). Namibian ornithological miscellanea. *Durban Mus. Novit.* **13**: 56-63.
Clancey, P.A. (1984a). Further on the status of *Anthus latistriatus* Jackson, 1899. *Gerfaut* **74**: 375-382.
Clancey, P.A. (1984b). Miscellaneous taxonomic notes on African birds. LXV. On the so-called Mountain Pipit of the Afrotropics. *Durban Mus. Novit.* **13(15)**: 189-194.
Clancey, P.A. (1984c). Miscellaneous taxonomic notes on African birds. LXVI. The Long-billed Pipit *Anthus similis* Jerdon in equatorial West Africa. *Durban Mus. Novit.* **13(18)**: 226-227.
Clancey, P.A. (1984d). Miscellaneous taxonomic notes on African birds. LXVI. Subspeciation in the Striped Pipit *Anthus lineiventris* Sundevall. *Durban Mus. Novit.* **13(18)**: 227-232.
Clancey, P.A. (1984e). Miscellaneous taxonomic notes on African birds. LXVI. Further on subspeciation in the Yellow-throated Longclaw *Macronyx croceus* (Vieillot). *Durban Mus. Novit.* **13(18)**: 232-238.
Clancey, P.A. (1985a). Species limits in the Long-billed Pipits of the southern Afrotropics. *Ostrich* **56(1-3)**: 157-169.
Clancey, P.A. (1985b). *The Rare Birds of Southern Africa*. Winchester Press, Johannesburg.
Clancey, P.A. (1985c). Subspeciation in *Anthus brachyurus* Sundevall, 1850. *Bull. Brit. Orn. Club* **105(4)**: 133-135
Clancey, P.A. (1986a). On the Mountain Pipit in Botswana. *Honeyguide* **32(1)**: 44.
Clancey, P.A. (1986b). Endemicity in the southern African avifauna. *Durban Mus. Novit.* **13(20)**: 245-284.
Clancey, P.A. (1986c). Miscellaneous taxonomic notes on African birds. LXVII. *Durban Mus. Novit.* **14(2)**: 7-27
Clancey, P.A. (1986d). The eastern and northeastern African subspecies of *Anthus similis* Jerdon. *Bull. Brit. Orn. Club* **106(2)**: 80-84.
Clancey, P.A. (1986e). Subspeciation in the pipit *Anthus cinnanomeus* Rüppell of the Afrotropics. *Gerfaut* **76**: 187-211.
Clancey, P.A. (1987a). The Tree Pipit *Anthus trivialis* (Linnaeus) in southern Africa. *Durban Mus Novit.* **14(3)**: 29-42.
Clancey, P.A. (1987b). Long-billed Pipit systematics. *Ostrich* **58(1)**: 45-46.
Clancey, P.A. (1988). The Wood Pipit - a species new to the South West African avifauna. *Cimbebasia (Ser. A)* **10**: 47-50
Clancey, P.A. (1989a). The status of *Anthus caffer mozimbaensis* Benson, 1955. *Bull. Brit. Orn. Club* **109(1)**: 43-47.
Clancey, P.A. (1989b). Zonal distribution in Afrotropical Montane Pipits (*Anthus*: Motacillidae). *Durban Mus. Novit.* **14(9)**: 157-172.
Clancey, P.A. (1990a). A review of some of the indigenous pipits (genus *Anthus* Bechstein: Motacillidae) of the Afrotropics. *Durban Mus. Novit.* **15**: 42-72.
Clancey, P.A. (1990b). The generic status of the Buff-streaked Chat of the southern Afrotropics. *Gerfaut* **80**: 179-191.
Clancey, P.A. (1990c). The nominate subspecies of the Redbreasted Swallow *Hirundo semirufa*. *Ostrich* **61(3&4)**: 152-153.
Clancey, P.A. (1991). On the races of *Anthus caffer* Sundevall, 1850, occurring in eastern Africa. *Bull. Brit. Orn. Club* **111(1)**: 36-38.
Clancey, P.A. (1993a). Subspeciation in the austral African Thick-billed Lark. *Bull. Brit. Orn. Club* **113(3)**: 173-178.
Clancey, P.A. (1993b). The background to "new" species of birds on the southern African list. *Birding in SA* **45(4)**: 99-103.
Clancey, P.A. (1996). *The Birds of Southern Mozambique*. African Bird Book Publishing, Westville, South Africa.
Clancey, P.A. & Holliday, C.S. (1952). A specimen of *Anthus richardi editus* Basutoland, obtained in central Natal. *Ostrich* **23(1)**: 54.
Clancey, P.A. & Irwin, M.P.S. (1966). The South African races of the Banded Sand Martin *Riparia cincta* (Boddaert) *Durban Mus. Novit.* **8**: 25-33.
Clancey, P.A., Brooke, R.K., Crowe, T.M. & Mendelsohn, J.M. (1987). *SAOS Checklist of Southern African Birds. First Updating Report*. Southern African Ornithological Society, Johannesburg.
Clancey, P.A., Lawson, W.J. & Irwin, M.P.S. (1969). The Mascarene Martin *Phedina borbonica* (Gmelin): a new species to the South African list. *Ostrich* **40**: 5-8.
Clapham, C.S. (1964). The birds of the Dahlac Archipelago. *Ibis* **106(3)**: 376-388.
Clapp, R.B. (1992). Northern Rough-winged Swallow building nest in semi-trailer. *Raven* **63**: 72-73.
Clapp, R.B., Klimkiewicz, M.K. & Futcher, A.G. (1983). Longevity records of North American birds: Columbidae through Paridae. *J. Field Orn.* **54**: 123-137.
Claramunt, S.J. (1999). Novedades de Cerro Largo. *Achara* **2(2)**: 3-5.
Claramunt, S.J. & González, E.M. (1999). *Elaenia spectabilis* y *Casiornis rufa*, dos Tyrannidae nuevos para Uruguay (Aves: Passeriformes). *Com. Zool. Mus. Hist. Nat. Montevideo* **12**: 1-8.
Claramunt, S.J. & Rocha, G. (2001). Hallazgo de *Elaenia mesoleuca* en Uruguay (Aves: Passeriformes: Tyrannidae). *Com. Zool. Mus. Nac. Hist. Nat. Antr.* **13(199)**: 1-4.
Claridge, J.C.R. (1983). Welcome Swallows at the Aukland Islands. *Notornis* **30(4)**: 282.
Clark, C. (1986). *Aves de Tierra del Fuego y Cabo de Hornos. Guía de Campo*. Literature of Latin America, Buenos Aires.
Clark, F. & McNeil, D.A.C. (1980). Cliff-nesting colonies of House Martins *Delichon urbica* in Great Britain. *Ibis* **122(1)**: 27-42.
Clark, R.B. (1947). Seasonal fluctuations in the song of the Skylark. *British Birds* **40**: 34-43.
Clark, R.B. (1948). Display flight of the Skylark. *British Birds* **41**: 244-246.
Clark, W.D. & Karr, J.R. (1979). Effects of highways on Red-winged Blackbird and Horned Lark populations. *Wilson Bull.* **91(1)**: 143-145.
Clarke, G. (1985). Bird observations from north-west Somalia. *Scopus* **9**: 24-42.
Clarke, J.E. (1980). The avifauna of Shaumari Wildlife Reserve, Jordan. *Sandgrouse* **1**: 50-70.
Clarke, S. (1920). Description of *Heteromirafra archeri*. *Bull. Brit. Orn. Club* **40**: 64.
Clarke, T. & Collins, D. (1996). *A Birdwatcher's Guide to the Canary Islands*. Prion Ltd. Perry, Huntingdon, UK.
Clarke, W.E. (1986). Seventy-five years ago: American Water-pipit at St. Kilda. *Britsh Birds* **79**: 81.
Clay, R.P. (1995). Photospot: Blue Manakin. *Cotinga* **4**: 80-81.
Clay, R.P. & Madroño, A. (1997). The first reported nest and eggs of the Russet-winged Spadebill *Platyrinchus leucoryphus*. *Cotinga* **8**: 83-85. In English with Spanish summary.
Clay, R.P., Capper, D.R., Mazar Barnett, J., Burfield, I.J., Esquivel, E.Z., Fariña, R., Kennedy, C.P., Perrens, M. & Pople, R.G. (1998). White-winged Nightjar *Caprimulgus candicans* and cerrado conservation: the key findings of Project Aguará Nu 1997. *Cotinga* **9**: 52-56.

Clay, R.P., Jack, S. & Vincent, J. (1995). A stronghold for Long-wattled Umbrellabird discovered in Ecuador. *Cotinga* **4**: 6-7.
Clay, R.P., Tobias, J.A., Lowen, J.C. & Beadle, D. (1998). Field identification of *Phylloscartes* and *Phyllomyias* tyrannulets in the Atlantic forest region. *Cotinga* **10**: 82-95. In English with Spanish and Portuguese summaries.
Clements, A. (1990). A record of Banded Martin *Riparia cincta* from Egypt. *Sandgrouse* **12**: 55-56.
Clements, J.F. & Shany, N. (2001). *A Field Guide to the Birds of Peru*. Ibis Publishing Company & Lynx Edicions, Temecula, California & Barcelona.
Clench, M.H. (1992). Body pterylosis of the Old World suboscine passerines (Aves: Acanthisittidae, Pittidae, Philepittidae, and Eurylaimidae). *Ann. Carnegie Mus.* **61(2)**: 153-169.
Clench, M.H. & Smith, G.T. (1985). Morphology of the Noisy Scrub-bird, *Atrichornis clamosus* (Passeriformes: Atrichornithidae): introduction, with remarks on plumage and sytematic position. *Records Austr. Mus.* **37(3-4)**: 111-114.
Clout, M.N. (1980). Comparisons of bird populations in exotic plantations and native forest. *New Zealand J. Ecol.* **3**: 158-160.
Coates, B.J. (1990). *The Birds of Papua New Guinea*. Vol. 2. Passerines. Dove Publications, Alderley, Australia.
Coates, B.J. (2001). *Birds of New Guinea and the Bismark Archipelago: a Photographic Guide*. Dove Publications, Queensland, Australia.
Coates, B.J. & Bishop, K.D. (1997). *A Guide to the Birds of Wallacea. Sulawesi, The Moluccas and Lesser Sunda Islands, Indonesia*. Dove Publications, Alderley, Australia.
Coates-Estrada, R. & Estrada, A. (1989). Avian attendance and foraging at army-ant swarms in the tropical rain forests of Los Tuxtlas, Veracruz, Mexico. *J. Trop. Ecol.* **5**: 281-292.
Coelho, G. & Silva, W. (1998). A new species of *Antilophia* (Passeriformes: Pipridae) from Chapada do Araripe, Ceará, Brazil. *Ararajuba* **6(2)**: 81-84.
Cofré, H. & Vilina, Y. (1999). Depredación del Mero *Agriornis livida* (Passeriformes: Tyrannidae), sobre la laucha de pelo largo, *Akodon longipilis*. *Bol. Chileno Orn.* **6**: 32-33.
Cohen, C. (1999). A hybrid zone between two non-sister species in the Karoo Lark *Certhilauda albescens* complex. Unpublished honours project, University of Cape Town, Cape Town.
Cohen, C., Leslie, R., Winter, D. & Eksteen, J. (1997). Second record of Mascarene Martin for southern Africa. *Africa. Birds & Birding* **2(4)**: 14.
Cohen, R.R. (1977). On the breeding ecology of the Tree Swallow (*Iridoprogne bicolor*) in the Colorado Rocky Mountains. *J. Colo. Wyo. Acad. Sci.* **9**: 47.
Cohen, R.R. (1978a). Behavioral adaptations for cavity-nesting in the Tree Swallow (*Iridoprocne bicolor*). *J. Colo. Wyo. Acad. Sci.* **10**: 41.
Cohen, R.R. (1978b). Vocalizations of the Tree Swallow. *J. Colo. Wyo. Acad. Sci.* **10**: 50.
Cohen, R.R. (1980). Color versus age in female Tree Swallows. *J. Colo. Wyo. Acad. Sci.* **12**: 44-45.
Cohen, R.R. (1982). A comparison of Violet-green Swallow and Tree Swallow breeding biology at high altitude in Colorado. *J. Colo. Wyo. Acad. Sci.* **14**: 60.
Cohen, R.R. (1984a). Criteria for distinguishing breeding male Tree Swallows from brightly colored females prior to capture. *North Amer. Bird Bander* **9**: 2-3.
Cohen, R.R. (1984b). Behavioral determinants of nest-site tenacity and mate fidelity patterns in Tree Swallows (*Tachycineta bicolor*). *J. Colo. Wyo. Acad. Sci.* **16**: 16.
Cohen, R.R. (1987). Violet-green Swallows (*Tachycineta thalassina*) have at least ten distinct vocalizations. *J. Colo. Wyo. Acad. Sci.* **19**: 18.
Cohen, R.R. (1988a). Energy-expensive behavior in incubating Tree Swallows (*Tachycineta bicolor*). *J. Colo. Wyo. Acad. Sci.* **20**: 9.
Cohen, R.R. (1988b). Is feather gathering by nesting swallows mainly an anti-parasitic tactic? *J. Colo. Wyo. Acad. Sci.* **20**: 9.
Cohen, R.R. (1989a). Day-song of the Tree Swallow (*Tachycineta bicolor*). *J. Colo. Wyo. Acad. Sci.* **21**: 11.
Cohen, R.R. (1989b). The pleasure call of female Tree Swallows (*Tachycineta bicolor*). *J. Colo. Wyo. Acad. Sci.* **21**: 11-12.
Cohen, R.R. (1994a). Female Violet-green Swallow (*Tachycineta thalassina*) incubation and brood time budgets. *J. Colo. Wyo. Acad. Sci.* **26**: 29.
Cohen, R.R. (1994b). Male Violet-green Swallow (*Tachycineta thalassina*) participation during incubation and nestling phases. *J. Colo. Wyo. Acad. Sci.* **26**: 29. (Abstract).
Cohen, R.R. & Dymerski, M.L. (1986). Swallows taking insects from pond surfaces. *Wilson Bull.* **98(3)**: 483-484.
Cohn-Haft, M. (1996). Why the Yungas Tody-tyrant (*Hemitriccus spodiops*) is a *Snethlagea*, and why it matters. *Auk* **113(3)**: 709-714.
Cohn-Haft, M. (2000). *A Case Study in Amazonian Biogeography: Vocal and DNA-sequence Variation in* Hemitriccus *Flycatchers*. PhD dissertation, Louisiana State University, Baton Rouge, Louisiana.
Cohn-Haft, M., Whittaker, A. & Stouffer, P.C. (1997). A new look at the "species-poor" Central Amazon: the avifauna north of Manaus, Brazil. Pp. 205-235 in: Remsen (1997).
Coimbra-Filho, A.F. (1971). Tres formas da avifauna do nordeste do Brasil ameaçadas de extinção: *Tinamus solitarius pernambucensis* Berla. 1946, *Mitu m. mitu* (Linnaeus, 1766) e *Procnias a. averano* (Hermann, 1783) (Aves-Tinamidae, Cracidae, Cotingidae). [Three forms of avifauna of northeastern Brazil threatened with extinction: *Tinamus solitarius pernambucensis* Berla, 1946, *Mitu m. mitu* (Linnaeus, 1766) and *Procnias a. averano* (Hermann, 1783) (Aves-Tinamidae, Cracidae, Cotingidae)]. *Rev. Brasil. Biol.* **31(2)**: 239-247. In Portuguese with English summary.
Colahan, B.D. & Pringle, E.L. (1998). Range extension of the Yellow-breasted Pipit in the Eastern Cape Province, South Africa. *Mirafra* **15(2)**: 27-29.
Colebrook-Robjent, J.F.R. (1988). Nest and eggs of the Angola Lark *Mirafra angolensis*. *Bull. Brit. Orn. Club* **108(1)**: 27-28.
Coles, D. (1976). High mountain observations during a trip to Mt. Wilhelm. *Papua New Guinea Bird Soc. Newsl.* **121**: 14-15.
Colin, D. (1988). Dupont's Lark in Cyprus in April, 1988. *Oriolus* **54(4)**: 182-183.
Collar, N.J. (1997). The threat status of the Sidamo Lark. *Bull. Brit. Orn. Club* **117(1)**: 75-76.
Collar, N.J. & Andrew, P. (1988). *Birds to Watch. The ICBP World Checklist of Threatened Birds*. ICBP Technical Publication **8**, Cambridge.
Collar, N.J. & Stuart, S.N. (1985). *Threatened Birds of Africa and Related Islands*. The ICBP/IUCN Red Data Book. Part 1. 3rd edition. ICBP & IUCN, Cambridge.
Collar, N.J. & Violani, C.G. (1984). Specimens of *Calandrella obbiensis* and *Sarothrura avresi* in Milan Museum. *Bull. Brit. Orn. Club* **104(3)**: 113-114.
Collar, N.J. & Wege, D.C. (1995). The distribution and conservation status of the Bearded Tachuri *Polystictus pectoralis*. *Bird Conserv. Int.* **5**: 367-390.
Collar, N.J., Andreev, A.V., Chan, S., Crosby, M.J., Subramanya, S. & Tobias, J.A. eds. (2001). *Threatened Birds of Asia: the BirdLife International Red Data Book*. BirdLife International, Cambridge.
Collar, N.J., Crosby, M.J. & Stattersfield, A.J. (1994). *Birds to Watch 2: the World List of Threatened Birds*. BirdLife International, Cambridge.
Collar, N.J., Gonzaga, L.P., Jones, P.J. & Scott, D.A. (1987). Avifauna da Mata Atlântica. Pp. 73-84 in: *Anais do Seminário de Desenvolvimento Econômico e Impacto Ambiental em Áreas de Trópico Úmido Brasileiro. A Experiência da CVRD. SMA/IWRB/Companhia Vale do Rio Doce*.
Collar, N.J., Gonzaga, L.P., Krabbe, N., Madroño, A., Naranjo, L.G., Parker, T.A. & Wege, D.C. (1992). *Threatened Birds of the Americas*. ICBP, Cambridge, UK.
Collett, R. & Olson, Ø. (1921). *Norges Fugle*. Aschehoug & Co., Kristiania.
Collin, A. & Collin, V. (1996). Contribution à l'étude de l'avifaune des Hauts Plateaux malgaches (axe Betafo - Miandrivazo). *Working Group on Birds in the Madagascar Region Newsletter* **6(1)**: 5-9.
Collins, C.T. & McDaniel (1989). Natal pterylosis of closed-nest building tyrant flycatchers (Aves, Tyrannidae). *Bull. South. Calif. Acad. Sci.* **88**: 127-130.
Collins, C.T. & Ryan, T.P. (1995). The biology of the Cinnamon Flycatcher *Pyrrhomyias cinnamomea* in Venezuela. *Orn. Neotropical* **5**: 125-128.
Collins, C.T., Delaney, D. & Atwood, J.L. (1990). First record of the Great Kiskadee in Baja California, Mexico. *Western Birds* **21**: 73-74.
Collins, R.E.C. (1984). Photo spot. 7. Berthelot's Pipit. *British Birds* **77(10)**: 475-476.
Colorado, G.J. & Pulgarín, P.C. (2003). Noteworthy observations of birds, including two globally threatened species, in the eastern Paria Peninsula, Venezuela. *Cotinga* **20**: 101-102.
Colston, P.R. (1982a). A new name for *Anthus melindae pallidus* Colston (1982). *Bull. Brit. Orn. Club* **107(2)**: 92.
Colston, P.R. (1982b). A new species of *Mirafra* (Alaudidae) and new races of the Somali Long-billed Lark *Mirafra somalica*, Thekla lark *Galerida malabarica* and Malindi Pipit *Anthus melindae* from southern coastal Somalia. *Bull. Brit. Orn. Club* **102(3)**: 106-114.
Colston, P.R. (1987). A new name for *Anthus melindae pallidus* Colston (1982). *Bull. Brit. Orn. Club* **107(2)**: 92.
Colston, P.R. & Curry-Lindahl, K. (1986). *The Birds of Mount Nimba, Liberia*. British Museum of Natural History, London.
Colston, P.R. & Shirihai, H. (1986). The first example of the Rufous Short-toed Lark *Calandrella brachydactyla dukhunensis* for the Western Palearctic, from the Negev Desert, Israel. *Sandgrouse* **7**: 62-63.
Combellack, C.R.B. (1954). A nesting of Violet-green Swallows. *Auk* **71(4)**: 435-442.
Conant, R. (1968). Zoological exploration in Mexico - the route of Lieut. D.N. Couch in 1853. *Amer. Mus. Novit.* **2350**: 1-14.
Concepción, D. (1992). *Avifauna del Parque Nacional de Timanfaya: Censo y Análisis*. ICONA, Red de Parques Nacionales, Madrid.
Congreve, P. (1972). Torpidity in the White-backed Swallow. *Emu* **72(1)**: 32-33.
Connor, M.A. (1980). Development of energy and mineral resources and its effects on bird conservation in southern Africa. Pp. 389-406 in: Johnson, D.N. (1980).
Conrad, K.F., Johnston, P.V., Crossman, C., Kempenaers, B., Robertson, R.J., Wheelwright, N.T. & Boag, T. (2001). High levels of extra-pair paternity in an isolated, low-density, island population of Tree Swallows (*Tachycineta bicolor*). *Mol. Ecol.* **10**: 1301-1308.
Conrad, K.F., Robertson, R.J. & Boag, P.T. (1998). Frequency of extrapair young increases in second broods of Eastern Phoebes. *Auk* **115(2)**: 497-502.
Conry, J.A. (1976). Nest site selection by Horned Larks (*Eremophila alpestris*) and Water Pipits (*Anthus spinoletta*) in the alpine tundra. *J. Colo. Wyo. Acad. Sci.* **8(1)**: 75. (Abstract).
Constant, P. & Eybert, M.C. (1980). Données sur la biologie de la reproduction du Pipit farlouse, *Anthus pratensis* L., dans les landes Bretonnes. [Contribution to the reproduction biology of the Meadow Pipit *Anthus pratensis* in Brittany]. *Nos Oiseaux* **35(8)**: 349-360. In French with German and English summary.
Contino, F. (1980). *Aves del Noroeste de Argentina*. Universidad Nacional de Salta, Salta, Argentina.
Contreras, A.J. (1988). New records from Nuevo León, Mexico. *Southwest. Nat.* **33**: 251-252.
Contreras, A.J. (1997). Resumen avifaunístico de Nuevo León, México. Pp. 35-44 in: Dickerman (1997).
Contreras, J.R. (1983). Notas sobre el peso de aves argentinas. Part 1. *Hist. Nat., Mendoza* **3(1)**: 16.
Contreras, J.R. (1995a). *Actualizaciones Ornitológicas para el Atlas Ornitogeográfico de la República del Paraguay. Passeriformes: Hirundinidae*. Monografía Especial **7**. Literature of Latin America, Buenos Aires.
Contreras, J.R. (1995b). *Heteroxolmis dominicana* (Vieillot, 1823) en la República del Paraguay (Aves: Tyrannidae). *Not. Faun.* **76**: 1-3.
Contreras, J.R. & Davies, Y.E. (1980). Aportes para el conocimiento del peso de las aves argentinas. *Rev. Asoc. Cienc. Nat. Litoral* **11**: 21-29.
Cooper, A. (1994). Ancient DNA sequences reveal unsuspected phylogenetic relationships within New Zealand wrens (Acanthisittidae). *Experientia* **50**: 558-563.
Cooper, A. & Cooper, R.A. (1995). The Oligocene bottleneck and New Zealand biota: genetic record of a past environmental crisis. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **261**: 293-302.
Cooper, D.S. (1997). Birds of the Río Negro Jaguar Preserve, Colonia Libertad, Costa Rica. *Cotinga* **8**: 17-22.
Cooper, K.H. (1963). The range of the Red-breasted Swallow, *Cecropis semirufa*, in Natal. *Ostrich* **34**: 171.
Cooper, M.R. (1985). A review of the genus *Macronyx* and its relationship with Yellow-bellied Pipit. *Honeyguide* **31(2)**: 81-92.
Cooper, M.R. & Donnelly, B.G. (1983). Zoogeography and speciation in *Eremopterix*. *Honeyguide* **116**: 20-25.
Coopmans, P. & Krabbe, N. (2000). A new species of flycatcher (Tyrannidae: *Myiopagis*) from eastern Ecuador and eastern Peru. *Wilson Bull.* **112(3)**: 305-443.
Cop, D.A. (1985). Hovering as feeding strategy of Pied Wagtail. *British Birds* **78**: 11.
Copete, J.L. & Armada, R. (2001). Identificación del Bisbita de Richard *Anthus richardi* y Bisbita de Blyth *Anthus godlewskii*. Pp. 321-338 in: Martínez, A. ed. (2001). *Anuari d'Ornitologia de Catalunya*. Grup Català d'Anellament, Barcelona.
Copley, D., Fraser, D. & Finlay, J.C. (1999). Purple Martins, *Progne subis*: a British Columbia success story. *Can. Field-Nat.* **113(2)**: 226-229.
Cordeiro, P.H.C. (2000). Levantamento en oito fragmentos de Mata Atlântica no sul da Bahia. Pp. 187-188 in: Straube *et al.* (2000). (Abstract).
Cornwallis, L. & Porter, R.F. (1982). Spring observations on the birds of North Yemen. *Sandgrouse* **4**: 1-36.
Corso, A. (2001). Head pattern variation in Black-headed Wagtail. *Birding World* **14(4)**: 162-166.
Cory, C.B. (1885). *The Birds of Haiti and San Domingo*. Estes & Lauriat, Boston.
Cory, C.B. (1890). *The Birds of the Bahama Islands*. Estes & Lauriat, Boston.
Cory, C.B. & Hellmayr, C.E. (1927). *Catalogue of Birds of the Americas*. Publications of the Field Museum of Natural History (Zoological Series) **13(5)**. 517 pp.
Cottam, C. & Knappen, P. (1939). Food of some uncommon North American birds. *Auk* **56**: 138-169.
Coulson, J.C. (1956a). Mortality and egg production of the Meadow Pipit with special reference to altitude. *Bird Study* **3**: 119-132.
Coulson, J.C. (1956b). Meadow Pipit nesting in building. *British Birds* **49**: 328.
Coutinho, L.M. (1982). Ecological effects of fire in Brazilian cerrado. Pp. 273-291 in: Huntley, B.J. & Walker, B.H. eds. (1982). *Ecology of Tropical Savannas*. Springer-Verlag, Berlin.
Couve, E. & Vidal-Ojeda, C. (2000). *Birds of the Beagle Channel and Cape Horn. Aves del Canal Beagle y Cabo de Hornos*. Fantástico Sur, Punta Arenas, Chile. In English and Spanish.
Couve, E. & Vidal-Ojeda, C. (2003). *Birds of Patagonia, Tierra del Fuego & Antarctic Peninsula: the Falkland Islands & South Georgia. Aves de Patagonia, Tierra del Fuego y Península Antártica: Islas Malvinas y Georgia del Sur*. Fantástico Sur, Punta Arenas, Chile. In English and Spanish.
Cowan, P.J. & Brown, G.M. (2001). Prostrate desert gourd plants as apparent cooling sites for larks in heat of day. *Sandgrouse* **23(1)**: 59-60.
Cowan, P.J. & Newman, D.L. (1998). Bar-tailed Desert Lark *Ammomanes cincturus* and Black-crowned Finch Lark *Eremopterix nigriceps* breeding in Kuwait. *Sandgrouse* **20(2)**: 146-147.
Cowan, R.S. (1968). Welcome Swallows in northern Hokianga, 1965-1967. *Notornis* **15(1)**: 28-30.
Cowan, R.S. (1971). Jottings on Welcome Swallows in Northland. *Notornis* **18(4)**: 266.
Cowley, E. (1979). Sand Martin population trends in Britain, 1965-1978. *Bird Study* **26**: 113-116.
Cowley, E. (1983). Multi-breeding and mate infidelity in the Sand Martin. *Bird Study* **30**: 1-7.
Cox, G.W. (1983). Foraging behaviour of the Dune Lark. *Ostrich* **54(2)**: 113-120.
Cox, S. & Inskipp, T. (1978). Male Citrine Wagtail feeding young wagtails in Essex. *British Birds* **71(5)**: 209-213.
Cracraft, J. (1981). Towards a phylogenetic classification of recent birds of the world (Class Aves). *Auk* **98(4)**: 681-714.
Cracraft, J. (1985). Historical biogeography and patterns of differentiation within the South American avifauna: areas of endemism. Pp. 49-84 in: Buckley *et al.* (1985).
Cracraft, J. (2001). Gondwana genesis. *Natural History* **110(10)**: 64-73.
Craig, J.L. (1984). Swallows at sea and established on the Kermadec Islands. *Notornis* **31(3)**: 201-202.
Cramp, S. (1970). Studies of less familiar birds. 159. Crag Martin. *British Birds* **63**: 239-243.
Cramp, S. ed. (1988). *The Birds of the Western Palearctic*. Vol. 5. Tyrant Flycatchers to Thrushes. Oxford University Press, Oxford.
Cramp, S. & Gooders, J. (1967). The return of the House Martin. *London Bird Rep.* **31**: 91-98.
Crawford, D.N. (1972). Birds of Darwin Area with some records from other parts of Northern Territory. *Emu* **72**: 131-148.
Crawford, R.L. (1976). Willow and Alder Flycatchers records at a north Florida TV tower. *Florida Field Nat.* **4**: 1-4.
Crawshay, R. (1907). *The Birds of Tierra del Fuego*. Bernard Quaritch, London.
Crenshaw, M.C. (2002). Seeds in droppings of Bare-necked Umbrellabird *Cephalopterus glabricollis* in Monteverde, Costa Rica: analysis of overlap in fruit diet. *Cotinga* **18**: 74-76.
Cresswell, R.A. (1968). Sighting of South Island Bush Wren. *Notornis* **15**: 125.
Cresswell, W. (1994). Song as a pursuit-deterrent signal, and its occurrence relative to other anti-predation behaviours of Skylark (*Alauda arvensis*) on attack by merlins (*Falco columbarius*). *Behav. Ecol. Sociobiol.* **34(3)**: 217-223.
Cresswell, W., Hughes, M., Mellanby, R., Bright, S., Catry, P., Chaves, J., Freile, J., Gabela, A., Martineau, H., Macleod, R., McPhee, F., Anderson, N., Holt, S., Barabas, S., Chapel, C. & Sánchez, T. (1999). Densities and habitat preferences of Andean cloud-forest birds in pristine and degraded habitats in north-eastern Ecuador. *Bird Conserv. Int.* **9(2)**: 129-145.
Cretin, J.Y., François, J. & Simeray, J. (1971). Une Hirondelle de fenêtre (*Delichon urbica*) en albinisme total. *Le Jean-le-Blanc* **10**: 34.
Creutz, G. (1961). Die Mehlschwalbe als Felsbrüterin. *Falke* **8**: 304-313.
Crewe, M.D. & Small, B.J. (2002). Temminck's Horned Lark *Eremophila bilopha* - a new species for The Gambia. *Bull. African Bird Club* **9(2)**: 136-138.
Critchley, R.A. (1975). Banded Sand Martin caught in sticky weed. *Bull. Zambian Orn. Soc.* **7**: 103.

Croft, K. (2003). The Black Lark on Anglesey - a new British bird. *Birding World* **16(6)**: 238-243.
Crook, J.R. & Shields, W.M. (1985). Sexually selected infanticide by adult male Barn Swallows. *Anim. Behav.* **33**: 754-761.
Crook, J.R. & Shields, W.M. (1987). Non-parental nest attendance in the Barn Swallow (*Hirundo rustica*): helping or harassment? *Anim. Behav.* **35**: 991-1001.
Crouchley, G. & Crouchley, D. (1979). Multiple clutches by Welcome Swallows in the Wairarapa. *Notornis* **26(3)**: 309-310.
de Crousaz, G. (1966). À propos des mouvements saisonniers de la population alpine du Pipit spioncelle. [In regard to the seasonal movements of the alpine population of the Water Pipit *Anthus spinoletta spinoletta*]. *Nos Oiseaux* **28**: 161-168.
Crowe, T.M., Ryan, P.G., Essop, M.F., Brooke, R.K., Hockey, P.A.R. & Siegfried, W.R. (1994). Species as the "currency" of conservation: the Karoo/Dune/Red Lark complex of south-western Africa. *Syst. Ass.* **50**: 229-234.
Croxall, J.P. (1987). The status and conservation of Antarctic seabirds and seals: a review. *Environm. Int.* **13**: 55-70.
Cruikshank, R. (1963). Pink-throated Longclaw. *Witwatersrand Bird Club News* **46**: 9.
Crutchfield, P.J. (1985). Horned Larks as breeding birds in the sandhills of North Carolina. *Chat* **49(1)**: 18-20.
Cruz, A. (1981). Bird activity and seed dispersal of a montane forest tree, *Dunalia arborescens*, in Jamaica, West Indies. *Biotropica* **13**: 34-44.
Cruz, A. (1993). Resource partitioning among a flycatcher guild in Jamaica. *Pitirre* **6(1)**: 5.
Cruz, A. & Andrews, R.W. (1989). Observations on the breeding biology of passerines in a seasonally flooded savanna in Venezuela. *Wilson Bull.* **101(1)**: 62-76.
Cruz, A. & Andrews, R.W. (1997). The breeding biology of the Pied Water-tyrant and its interactions with the Shiny Cowbird in Venezuela. [La biología reproductiva de *Fluvicola pica* y su interacción con *Molothrus bonariensis* en Venezuela]. *J. Field Orn.* **68(1)**: 91-97. In English with Spanish summary.
Csicsáky, M. (1978). Über den Gesang der Feldlerche (*Alauda arvensis*) und seine Beziehung zur Atmung. *J. Orn.* **119(3)**: 249-264.
Cuello, J. (1985). *Lista de Referencia y Bibliografía de las Aves Uruguayas*. Intendencia Municipal de Montevideo, Montevideo.
Cuervo, A.M. & Delgado, C.A. (2001). Adiciones a la avifauna del Valle de Aburrá y comentarios sobre la investigación ornitológica local. *Bol. Soc. Antioqueña Orn.* **12(22-23)**: 52-65.
Cuervo, A.M. & Renjifo, L.M. (2002). *Lipaugus weberi*. Pp. 356-359 in: Renjifo *et al.* (2002).
Cuervo, A.M., Salaman, P.G.W., Donegan, T.M. & Ochoa, J.M. (2001). A new species of *Piha* (Cotingidae: *Lipaugus*) from the Cordillera Central of Colombia. *Ibis* **143(3)**: 353-368.
Cuervo, J.J., de Lope, F. & Møller, A.P. (1996). The function of long tails in female Barn Swallows (*Hirundo rustica*): an experimental study. *Behav. Ecol.* **7**: 132-136.
Cuervo, J.J., de Lope, F., Møller, A.P. & Moreno, J. (1996). Energetic cost of tail streamers in the Barn Swallow (*Hirundo rustica*). *Oecologia* **108**: 252-258.
Cueto, V.R. & López, J. (2002). Foraging behavior and microhabitat use of birds inhabiting coastal woodlands in eastcentral Argentina. *Wilson Bull.* **114(3)**: 342-348.
de la Cueva, H. & Blake, R.W. (1997). Flight speed, foraging efficiency, and daily energy budget of the Barn Swallow, *Hirundo rustica*. *Can. J. Zool.* **75**: 1176-1183.
Cuisin, J. (1981). L'identification des crânes de petits passereaux. *Oiseau et RFO* **51(1)**: 17-31.
Curchod, J., Carron, G., Maumary, L. & Posse, B. (1990). Première preuve de nidification de l'Alouette calandrelle, *Calandrella brachydactyla*, en Suisse. *Nos Oiseaux* **40(6)**: 345-353.
Curry-Lindahl, K. (1958). Internal timer and spring migration in an equatorial migrant, the Yellow Wagtail (*Motacilla flava*). *Ark. Zool., Ser. 2* **11(33)**: 541-557.
Curry-Lindahl, K. (1963). Molt, body weights, gonadal development, and migration in *Motacilla flava*. Pp. 960-973 in: Sibley (1963).
Curry-Lindahl, K. (1980). The Forest Wagtail *Motacilla indica* recorded in Nepal. *Bull. Brit. Orn. Club* **100(3)**: 201-202.
Curson, D.R., Goguen, C.B. & Mathews, N.E. (1996). Nest-site reuse in the Western Wood-pewee. *Wilson Bull.* **108(2)**: 378-380.
Curson, J. & Lowen, J. (2000). Neotropical News. Ecuador. Jatun Sacha threatened by road. *Cotinga* **13**: 7.
Curtis, H.S. (1972). The Albert Lyrebird in display. *Emu* **72(3)**: 81-84.
Curtis, H.S. (1998). Lyrebirds: veiled in secrecy. *Austr. Nature* **26(1)**: 32-41.
Custer, C.M., Custer, T.W., Allen, P.D., Stromborg, K.L. & Melancon, M.J. (1998). Reproduction and environmental contamination in Tree Swallows nesting in the Fox River drainage and Green Bay, Wisconsin, USA. *Environm. Toxicol. Chem.* **17**: 1786-1798.
Cuthbert, N.L. (1962). The Michigan Audubon Society phoebe study (Part II). *Jack-Pine Warbler* **40**: 68-83.
Cyr, A. (1995). Répartition saisonnière et spatio-temporelle du Pipit d'Amérique (*Anthus rubescens*) pour le Québec méridional de 1969 à 1989. Pp. 498-499 in: Cyr, A. & Larivée, J. eds. (1995). *Atlas Saisonnier des Oiseaux du Québec*. Presses de l'Université de Sherbrooke & Société Ornithologique de l'Estrie, Sherbrooke, Québec, Canada.
Cyr, A. & Larivée, J. eds. (1995). *Atlas Saisonnier des Oiseaux du Québec*. Presses de l'Université de Sherbrooke & Société Ornithologique de l'Estrie, Sherbrooke.
Czerwinski, E. (1996). Opportunistic nesting of Bank Swallow. *Birders J.* **5**: 133.
Dabbene, R. (1919). Nido y huevos del tiránido *Phylloscartes ventralis angustirostris*. *Hornero* **1**: 292.
van Daele, P. (1999). New breeding data for Red-throated Cliff Swallow *Hirundo rufigula* at Mutanda Bridge 1998. Pp. 112-113 in: Leonard, P.M. & Peters, W. eds. (1999). *Zambia Bird Report 1998*. Zambian Ornithological Society, Lusaka.
Daguerre, J.B. (1922). Lista de aves coleccionadas y observadas en Rosas, F.C.S. *Hornero* **2**: 259-271.
Dale, B.C., Martin, P.A. & Taylor, P.S. (1997). Effects of hay management on grassland songbirds in Saskatchewan. *Wildl. Soc. Bull.* **25**: 616-626.
Danforth, S.T. (1929). Notes on the birds of Hispaniola. *Auk* **46(3)**: 358-375.
Danforth, S.T. (1935a). *The Birds of St. Lucia*. University of Puerto Rico, Río Piedras.
Danforth, S.T. (1935b). Investigations concerning Cuban birds, with special reference to the economic status and considerations of those which might be desirable for introduction into Puerto Rico. *J. Agric. Univ. Puerto Rico* **19**: 421-438.
Daniels, R.J.R. (1997). *A Field Guide to the Birds of Southwestern India*. Oxford University Press, Delhi.
Danielsen, F., Balete, D.S., Christensen, T.D., Heegaard, M., Jakobsen, O.F., Jensen, A., Lund, T. & Poulsen, M.K. (1994). *Conservation of Biological Diversity in the Sierra Madre Mountains of Isabela and Southern Cagayan Province, The Philippines*. Department of Environment and Natural Resources, BirdLife International & Danish Ornithological Society, Manila & Copenhagen.
Danks, A. (1991). The role of corridors in the management of an endangered passerine. Pp. 291-296 in: Saunders, D.A. & Hobbs, R.J. eds. (1991). *Nature Conservation 2: the Role of Corridors*. Surrey Beatty & Sons, Chipping Norton, Australia.
Danks, A. (1993). What annoys a scrub-bird? *Wingspan* **3**: 6-7.
Danks, A. (1997). Conservation of the Noisy Scrub-bird: a review of 35 years of research and management. *Pacific Conserv. Biol.* **3**: 341-349.
Danks, A. & Calver, M.C. (1993). Diet of the Noisy Scrub-bird *Atrichornis clamosus* at Two Peoples Bay, south-western Western Australia. *Emu* **93(3)**: 203-205.
Danks, A., Burbidge, A.A., Burbidge, A.H. & Smith, G.T. (1992). *Recovery Plan for the Noisy Scrub-bird* Atrichornis clamosus. Western Australian Department of Conservation and Land Management, Perth.
Daoudi, S., Voisin, J.F. & Doumandji, S. (2002). Spectre alimentaire d'une colonie suburbaine de l'Hirondelle de fenêtre *Delichon urbica* Linné, 1758 (Aves, Hirundinidé) en Algérie. *Rev. Écol. (Terre Vie)* **57**: 83-89.
Darlington, P.J. (1931). Notes on the birds of the Río Frío (near Santa Marta), Magdalena, Colombia. *Bull. Mus. Comp. Zool., Harvard* **71(6)**: 349-421.
Darolova, A. (1997). Number and placement of House Martin (*Delichon urbica*) nests in south-western Slovakia. *Biologia* **52**: 669-676.
Darrieu, C.A. (1987). Estudios sobre la avifauna de Corrientes. IV. Nuevos registros de aves (Passeriformes, Tyrannidae) y consideraciones sobre su distribución geográfica. *Neotrópica* **33(89)**: 29-38.
Darrieu, C.A. & Camperi, A.R. (1991). Estudio de una colección de aves de Corrientes. 2. (Formicariidae, Cotingidae, Pipridae). *Neotrópica* **37(97)**: 75-80.
Darveau, M., DesGranges, J.L. & Gauthier, G. (1992). Habitat use by three breeding insectivorous birds in declining maple forests. *Condor* **94(1)**: 72-82.
Darveau, M., Gauthier, G., DesGranges, J.L. & Mauffette, Y. (1993). Nesting success, nest sites, and parental care of the Least Flycatcher in declining maple forests. *Can. J. Zool.* **71**: 1592-1601.
Dathe, H. (1952). Beitrag zur Brutbiologie der Kurzzehenlerche *Calandrella b. brachydactyla* (Leisler). *Beitr. Vogelkd.* **2**: 15-32.
Daunicht, W. (1985). Das Vorkommen der Heidelerche (*Lullula arborea*) in Schleswig-Holstein. *Corax* **11(1)**: 1-44.
David, J.H.M. (1971). A short note on the frequency of feeding of Thick-billed Lark nestlings. *Ostrich* **42**: 152.
David, N. & Gosselin, M. (2002a). Gender agreement of avian species names. *Bull. Brit. Orn. Club* **122(1)**: 14-49.
David, N. & Gosselin, M. (2002b). The grammatical gender of avian genera. *Bull. Brit. Orn. Club* **122(4)**: 257-282.
Davidar, P. (1987). Fruit structure in two Neotropical mistletoes and its consequences for seed dispersal. *Biotropica* **19(2)**: 137-139.
Davidar, P. & Morton, E.S. (1993). Living with parasites: prevalence of a blood parasite and its effect on survivorship in the Purple Martin. *Auk* **110(1)**: 109-116.
Davidson, P. (1996). Habitats and bird communities in southern Yemen and Socotra. *Sandgrouse* **17(1-2)**: 102-129.
Davidson, P. & Kirwan, G. (1997). Around the region. *Sandgrouse* **19(1)**: 76-80.
Davidson, P., Duckworth, W. & Poole, C. (2001). Mekong Wagtail *Motacilla samveasnae*: the Great River's only known avian endemic. *Bull. Oriental Bird Club* **34**: 56-59.
Davies, C.W.N., Barnes, R., Butchart, S.H.M., Fernández, M. & Seddon, N. (1994). *The Conservation Status of the Cordillera de Colán. A Report Based on Bird and Mammal Surveys in 1994*. Published privately.
Davies, C.W.N., Barnes, R., Butchart, S.H.M., Fernández, M. & Seddon, N. (1997). The conservation status of birds on the Cordillera de Colán, Peru. *Bird Conserv. Int.* **7(2)**: 181-195.
Davies, G., Christian, M., Campbell, H. & Boon, R. (2003). Short-tailed Pipit breeding at Vernon Crookes Nature Reserve. *KZN Birds* **4**: 22-23.
Davies, N.B. (1976). Food, flocking and territorial behaviour of the Pied Wagtail (*Motacilla alba yarrellii* Gould) in winter. *J. Anim. Ecol.* **45(1)**: 235-253.
Davies, N.B. (1977). Prey selection and social behaviour in wagtails (Aves: Motacillidae). *J. Anim. Ecol.* **46**: 37-57.
Davies, N.B. (1982). Territorial behaviour of Pied Wagtails in winter. *British Birds* **75**: 261-267.
Davies, N.B. (1985). Wagtail. Pp. 637-638 in: Campbell & Lack (1985).
Davies, N.B. (1989). Co-evolution between the Cuckoo *Cuculus canorus* and its hosts. *J. Zool.* **217(3)**: 521-523.
Davies, N.B. & Brooke, M. de L. (1989a). An experimental study of co-evolution between the Cuckoo, *Cuculus canorus*, and its hosts. I. Host egg discrimination. *J. Anim. Ecol.* **58(1)**: 207-224.
Davies, N.B. & Brooke, M. de L. (1989b). An experimental study of co-evolution between the Cuckoo, *Cuculus canorus*, and its hosts. II. Hostegg markings, chick discrimination and general discussion. *J. Anim. Ecol.* **58(1)**: 225-236.
Davies, N.B. & Houston, A.I. (1981). Owners and satellites: the economics of territory defence in the Pied Wagtail, *Motacilla alba*. *J. Anim. Ecol.* **50(1)**: 157-180.
Davies, N.B. & Houston, A.I. (1983). Time allocation between territories and flocks and owner-satellite conflict in foraging Pied Wagtails, *Motacilla alba*. *J. Anim. Ecol.* **52(2)**: 621-634.
Davies, S.J.J.F., Smith, G.T. & Robinson, F.N. (1982). The Noisy Scrub-bird in Western Australia. Pp. 117-127 in: Groves, R.H. & Ride, W.D.L. eds. (1982). *Species at Risk: Research in Australia*. Australian Academy of Science, Canberra.
Davis, D.E. (1941). The belligerency of the kingbird. *Wilson Bull.* **53(3)**: 157-168.
Davis, D.E. (1945). The annual cycle of plants, mosquitoes, birds, and mammals in two Brazilian forests. *Ecol. Monogr.* **15**: 243-295.
Davis, D.E. (1946). A seasonal analysis of mixed flocks of birds in Brazil. *Ecology* **27**: 168-181.
Davis, D.E. (1954). The breeding biology of Hammond's Flycatcher. *Auk* **71(2)**: 164-171.
Davis, D.E. (1955). Observations on the breeding biology of kingbirds. *Condor* **57(3)**: 208-212.
Davis, D.E. (1959). Observations of territorial behaviour of Least Flycatcher. *Wilson Bull.* **71(1)**: 73-85.
Davis, J. & Miller, A.H. (1962). Further information on the Caribbean Martin in Mexico. *Condor* **64(3)**: 237-239.
Davis, J., Fisler, G.F. & Davis, B.S. (1963). The breeding biology of the Western Flycatcher. *Condor* **65(5)**: 337–382.
Davis, J.A. (1998). Intraspecific brood parasitism in Purple Martins. *Bull. Okla. Orn. Soc.* **31(4)**: 29-33.
Davis, J.A. & Brown, C.R. (1999). Costs of coloniality and the effect of colony size on reproductive success in Purple Martins. *Condor* **101(4)**: 737-745.
Davis, L.I. (1961). Songs of North American *Myiarchus*. *Texas J. Sci.* **13**: 327-344.
Davis, L.I. & Webster, F.S. (1970). An intergeneric hybrid flycatcher. *Condor* **72(1)**: 37-42.
Davis, P. (1965). Recoveries of swallows ringed in Britain and Ireland. *Bird Study* **12**: 151-169.
Davis, P. (1966). The movements of Pied Wagtails as shown by ringing. *Bird Study* **13**: 147-162.
Davis, P.R. (1976). *Response of Vertebrate Fauna to Forest Fire and Clearcutting in Southcentral Wyoming*. PhD dissertation, University of Wyoming, Laramie, Wyoming.
Davis, S.E. (1993). Seasonal status, relative abundance, and behavior of the birds of Concepción, Departamento Santa Cruz, Bolivia. *Fieldiana Zool. (New Ser.)* **71**: 1-33.
Davis, S.K. (2003). Nesting ecology of mixed-grass prairie songbirds in southern Saskatchewan. *Wilson Bull.* **115(2)**: 119-130.
Davis, S.K., Duncan, D.C. & Skeel, M. (1999). Distribution and habitat associations of three endemic songbirds in southern Saskatchewan. *Wilson Bull.* **111(3)**: 389-396.
Davis, T.A.W. (1949a). Display of White-throated Manakins *Corapipo gutturalis*. *Ibis* **91(1)**: 146-147.
Davis, T.A.W. (1949b). Field notes on the Orange-crested Manakin *Neopelma chrysocephalum* (Pelz.). *Ibis* **91(2)**: 349-350.
Davis, T.A.W. (1953). An outline of the ecology and breeding seasons of birds of the lowland forest region of British Guiana. *Ibis* **95(3)**: 450-467.
Davis, T.H. (1982). A flight-song display of White-throated Manakin. *Wilson Bull.* **94(4)**: 594-595.
Davis, T.J. (1986). Distribution and natural history of some birds from the departments of San Martín and Amazonas, northern Peru. *Condor* **88(1)**: 50-56.
Davis, W.H. & Kalisz, P.J. (1994). Tree Swallow (*Tachycineta bicolor*) nesting in the bluegrass. *Kentucky Warbler* **70**: 75-76.
Dawson, D.G., Dilks, P.J., Gaze, P.D., McBurney, J.G.R. & Wilson, P.R. (1978). Seasonal differences in bird counts in forests near Reefton, South Island, New Zealand. *Notornis* **25**: 257-278.
Dawson, E.W. (1951). Bird notes from Stewart Island. *Notornis* **4**: 146-149.
Dawson, W.L. (1923). *The Birds of California*. Vol. 2. South Moulton Company, San Diego, California.
De Garine-Wichatitsky, M., Cheke, R.A. & Lázaro, D. (2001). Effects of tsetse targets on mammals and birds in Kasungu National Park, Malawi. *Biodiversity and Conservation* **10**: 869-891.
Dean, A.R. (1980). Field-characters of Desert and Bar-tailed Desert Larks. *British Birds* **73(10)**: 476-477.
Dean, W.R.J. (1971). Breeding data for the birds of Natal and Zululand. *Durban Mus. Novit.* **9(6)**: 59-91.
Dean, W.R.J. (1974). Breeding and distributional notes on some Angolan birds. *Durban Mus. Novit.* **10(8)**: 109-125.
Dean, W.R.J. (1978). An analysis of avian stomach contents from southern Africa. *Bull. Brit. Orn. Club* **98(1)**: 10-13.
Dean, W.R.J. (1979). On the generic name of the "dusky" larks. *Ostrich* **50(1)**: 60-62.
Dean, W.R.J. (1987). Birds associating with fire at Nylsvley Nature Reserve, Transvaal. *Ostrich* **58**: 103-106.
Dean, W.R.J. (1989a). A review of the genera *Calandrella*, *Spizocorys* and *Eremalauda* (Alaudidae). *Bull. Brit. Orn. Club* **109(2)**: 95-100.
Dean, W.R.J. (1989b). The nest, eggs and nestlings of the Red Lark *Certhilauda burra*. *Ostrich* **60(4)**: 158.
Dean, W.R.J. (1989c). Pearl-breasted Swallow apparently eating lime. *Birding in SA* **41**: 88.
Dean, W.R.J. (1997). The distribution and biology of nomadic birds in the Karoo, South Africa. *J. Biogeogr.* **24**: 769-779.
Dean, W.R.J. (2000). *The Birds of Angola. An Annotated Check-list*. BOU Check-list **18**. British Ornithologists' Union, Tring, UK.
Dean, W.R.J. & Colston, P.R. (1988). The taxonomy of Sclater's Lark *Spizocorys sclateri*. *Bull. Brit. Orn. Club* **108(4)**: 173-174.
Dean, W.R.J. & Hockey, P.A.R. (1989). An ecological perspective of lark (Alaudidae) distribution and diversity in the southwest-arid zone of Africa. *Ostrich* **60(1)**: 27-34.
Dean, W.R.J. & Macdonald, I.A.W. (1981). A review of African birds feeding in association with mammals. *Ostrich* **52**: 135-155.
Dean, W.R.J. & Milton, S.J. (2001). The density and stability of birds in shrubland and drainage line woodland in the southern Karoo, South Africa. *Ostrich* **72(3&4)**: 185-192.
Dean, W.R.J. & Siegfried, W.R. (1997). The protection of endemic and nomadic avian diversity in the Karoo, South Africa. *S. Afr. J. Wildl. Res.* **27(1)**: 11-21.
Dean, W.R.J., Huntley, M.A., Huntley, B.J. & Vernon, C.J. (1988). Notes on some birds of Angola. *Durban Mus. Novit.* **14(4)**: 43-92.
Dean, W.R.J., Milton, S.J., Watkeys, M.K. & Hockey, P.A.R. (1991). Distribution, habitat preference and conservation status of the Red Lark *Certhilauda burra* in Cape Province, South Africa. *Biol. Conserv.* **58(3)**: 257-274.
Dean, W.R.J., Walters, M.P. & Dowsett, R.J. (2003). Records of birds breeding collected by Dr. W. Ansorge in Angola and Gabon. *Bull. Brit. Orn. Club* **123(4)**: 239-250.
Dearborn, N. (1907). *Catalogue of a Collection of Birds of Guatemala*. Publications of the Field Museum of Natural History (Ornithological Series) **125, pt. 1(3)**. 69 pp.

Dechant, J.A., Sondreal, M.L., Johnson, D.H., Igi, L.D., Goldade, C.M., Nenneman, M.P. & Euliss, B.R. (1998). *Effects of Management Practices on Grassland Birds: Sprague's Pipit*. Northern Prairie Wildlife Research Center, Jamestown, North Dakota. 15 pp.
Dee, T.J. (1986). *The Endemic Birds of Madagascar*. ICBP, Cambridge.
DeGraaf, R.M. & Rappole, J.H. (1995). *Neotropical Migratory Birds. Natural History, Distribution and Population Change*. Comstock Publishing Associates, Ithaca & London.
DeGraaf, R.M. & Rudis, D.D. (1986). *New England Wildlife: Habitat, Natural History and Distribution*. USDA Forest Service General Technical Report **NE-108**. Northeastern Forest Experiment Station, Broomall, Pennsylvania. 491 pp.
Deignan, H.G. (1945). *The Birds of Northern Thailand*. US National Museum Bulletin **186**. Smithsonian Institution, Washington, D.C. 616 pp.
DeJong, M.J. (1996). Northern Rough-winged Swallow (*Stelgidopteryx serripennis*). No. **234** in: Poole, A.F. & Gill, F.B. eds. (1996). *The Birds of North America*. Vol. 6. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Dekker, R.W.R.J. & Dickinson, E.C. (2001a). Systematic notes on Asian birds. 11. A preliminary review of the Alaudidae. Pp. 61-84 in: Dekker & Dickinson (2001b).
Dekker, R.W.R.J. & Dickinson, E.C. eds. (2001b). *Systematic Notes on Asian Birds 9-21*. Zoologische Verhandelingen **335**. Nationaal Natuurhistorisch Museum, Leiden. 252 pp.
Delacour, J. (1932). *Les Oiseaux de la Mission Franco-Anglo-Américaine à Madagascar*. Oiseau et RFO **2**. 96 pp.
Delacour, J. (1947). *The Birds of Malaysia*. Macmillan Co., New York.
Delacour, J. & Jabouille, P. (1940). *Liste des Oiseaux de l'Indochine Française*. Oiseau et RFO **1-2**. 132 pp.
Delgado, F.S. (1985). Present situation of the forest birds of Panama. Pp. 77-93 in: Diamond & Lovejoy (1985).
Delius, J.D. (1963). Das Verhalten der Feldlerche. *Z. Tierpsychol.* **20**: 297-348.
Delius, J.D. (1965). A population study of Skylarks *Alauda arvensis*. *Ibis* **107(4)**: 466-492.
Delius, J.D. (1969). A stochastic analysis of the maintenance behaviour of Skylarks. *Behaviour* **33**: 137-178.
Della Sala, D.A. & Rabe, D.L. (1987). Response of Least Flycatchers to forest disturbances. *Biol. Conserv.* **41**: 291-299.
Dementiev, G.P., Gladkov, N.A., Blagosklonov, K.N., Meklenburtsev, R.N., Ptushenko, E.S., Rustamov, A.K., Shtegman, B.K., Spangenberg, E.P., Sudilovskaya, A.M. & Volchanetskii, I.B. (1968). *Birds of the Soviet Union*. Vol. 6. Israel Program for Scientific Translations, Jerusalem.
Dementiev, G.P., Gladkov, N.A., Sudilovskaya, A.M., Spangenberg, E.P., Boehme, L.V., Volchanetskii, I.B., Voinstvenskii, M.A., Gorchakovskaya, N.N., Korelov, M.N. & Rustamov, A.K. (1970). *Birds of the Soviet Union*. Vol. 5. Israel Program for Scientific Translations, Jerusalem.
Demey, R. (1998). Recent Reports. South Africa. *Bull. African Bird Club* **5(2)**: 146.
Demey, R. (2003). Recent Reports Angola. *Bull. African Bird Club* **10(2)**: 130.
Demey, R. (2004a). Recent Reports. Botswana. *Bull. African Bird Club* **11(1)**: 71.
Demey, R. (2004b). Recent Reports. Kenya. *Bull. African Bird Club* **11(1)**: 73-76.
Demey, R. (2004c). Recent Reports. Zimbabwe. *Bull. African Bird Club* **11(1)**: 79.
Demey, R. & Fishpool, L.D.C. (1991). Additions and annotations to the avifauna of Côte d'Ivoire. *Malimbus* **12**: 61-86.
Demey, R. & Fishpool, L.D.C. (1994). The birds of Yapo Forest, Ivory Coast. *Malimbus* **16(2)**: 100-122.
Demey, R., Herroelen, P. & Pedersen, T. (2000). Additions and annotations to the avifauna of Congo-Kinshasa (ex-Zaïre). *Bull. Brit. Orn. Club* **120(3)**: 154-172.
Deng Heli & Zhang Xiaoai (1988). [Studies on the breeding biology of the Long-billed Calandra Lark *Melanocorypha maxima*]. *Acta Biol. Plateau Sinica* **8**: 52-58. In Chinese with English summary.
Deng Heli & Zhang Xiaoai (1991). [Accumulation and allocation of energy for Horned Lark in the egg-forming process]. *Acta Biol. Plateau Sinica* **10**: 125-133. In Chinese with English summary.
Deng Heli, Zhang Xiaoai & Lin Ming (1991a). [Energetics of growth in nestling Long-billed Calandra Lark]. *Zool. Res.* **12(2)**: 176-180. In Chinese with English summary.
Deng Heli, Zhang Xiaoai & Lin Ming (1991b). [The developments of metabolic intensity and thermoregulation in nestlings of Horned and Long-billed Calandra larks]. *Acta Biol. Plateau Sinica* **10**: 135-142. In Chinese with English summary.
Denkinger, J. (1994). [Distribution and population of Meadow Pipit *Anthus pratensis* and Water Pipit *Anthus spinoletta* in the "Solothurner Jura", Switzerland, 1983-1990]. *Orn. Beob.* **91(3)**: 163-172. In German with English summary.
Denninson, M.D. (1974). Sunbathing swallows?. *Notornis* **21(3)**: 263.
Dennis, R.H. & Wallace, D.I.M. (1975). Field identification of Short-toed and Lesser Short-toed Larks. *British Birds* **68(6)**: 238-241.
Derney, R. & Demey, R. (1998). Recent Reports. *Bull. African Bird Club* **5(2)**: 142-146.
DeSante, D.F. & George, T.L. (1994). Populations trends in the landbirds of western North America. *Stud. Avian Biol.* **15**: 173–190.
DeSante, D.F. & Pyle, P. (1986). *Distributional Checklist of North American Birds*. Vol. 1. United States and Canada. Artemisia Press, Lee Vining, California.
Descourtilz, J.T. (1983). *História Natural das Aves do Brasil. (Ornitologia Brasileira). Notáveis por sua Plumagem, Canto e Hábitos*. Editora Itatiaia Limitada. Belo Horizonte, Brazil.
Desfayes, M. (1975). Birds from Ethiopia. *Rev. Zool. Afr.* **89(3)**: 505-535.
Desfayes, M. (1997). A specimen of *Hirundo abyssinica* from Madagascar. *Bull. Brit. Orn. Club* **117(4)**: 315.
Desfayes, M. & Praz, J.C. (1978). Notes on the habitat and distribution of montane birds in southern Iran. *Bonn. Zool. Beitr.* **29**: 18–37.
Develey, P.F. (2004). *Aves da Grande São Paulo: Guia de Campo. Birds of Greater São Paulo: Field Guide*. Aves e Fotos Editora, São Paulo. In Portuguese and English.
DeWeese, L.R., Cohen, R.R. & Stafford, C.J. (1985). Organochlorine residues and eggshell measurements for Tree Swallows, *Tachycineta bicolor*, in Colorado, USA. *Bull. Environm. Contam. Toxicol.* **35**: 767-775.
Dharmakumarsinhji, K.S. (1951). Occurrence of Hodgson's Pipit *Anthus roseatus* in Saurashtra. *J. Bombay Nat. Hist. Soc.* **50(1)**: 175.
Dhinsa, M.S. & Sandhu, P.S. (1988). Vinaceous-breasted *Anthus roseatus* and Upland *A. sylvanus* Pipits at Ludhiana, Punjab. *Geobios New Rep.* **7(1)**: 75-76.
Di Giacomo, A.G. (1992). Description of the nests of *Knipolegus cyanirostris* and *Pseudocolopteryx sclateri*. *Hornero* **13(3)**: 244-245.
Di Giacomo, A.G. (1995). An ornithological survey of Argentine National Parks. *Cotinga* **3**: 69.
Di Giacomo, A.G. (1996). Biología reproductiva del Tachuri Coludo *Culicivora caudacuta*. Page 16 in: *IX Reunión Argentina de Ornitologia*. Asociación Ornitológica del Plata, Buenos Aires. (Abstract).
Di Giacomo, A.G. (2004). Inventario de la biodiversidad de la Reserva Ecológica El Bagual, Formosa, Argentina. Temas de Naturaleza y Conservación **4**. Aves Argentinas/Asociación Ornitológica del Plata, Buenos Aires. MS.
Di Giacomo, A.G. & Leiberman, J. (2000). Descripción del pichón de *Xenopsaris albinucha*. [Description of the nestling of *Xenopsaris albinucha*]. *Hornero* **15(2)**: 129-130. In Spanish with English summary.
Di Giacomo, A.G. & López, B. (1998). Aportes sobre la nidificación de veinte especies de aves del noroeste argentino. *Hornero* **15(1)**: 29-38.
Di Giacomo, A.G. & López, B. (2000). Nuevos aportes al conocimiento de la nidificación de algunas aves del noroeste argentino. [New notes on the nesting of some species of northwestern Argentina birds]. *Hornero* **15(2)**: 131-134. In Spanish with English summary.
Di Giacomo, A.S. & Di Giacomo, A.G. (2004). Extinción, historia natural y conservación de las poblaciones del Yetapá de Collar en Argentina. *Orn. Neotropical* **15**: 145-158.
Di Giacomo, A.S. & Krapovickas, S. (2001). Afforestation threatens Argentina's grasslands. *World Birdwatch* **23(3)**: 24-25.
Diamond, A.W. ed. (1987). *Studies of Mascarene Island Birds*. Cambridge University Press, Cambridge.
Diamond, A.W. (1991). Assessment of the risks from tropical deforestation to Canadian songbirds. Pp. 177-194 in: *Transactions of the 56th North American Wildlife and Nature Research Conference*.
Diamond, A.W. & Lovejoy, T.E. ed. (1985). *Conservation of Tropical Forest Birds*. ICBP Technical Publication **4**. Cambridge.
Diamond, J.M. (1972). *Avifauna of the Eastern Highlands of New Guinea*. Publications of the Nuttall Ornithological Club **12**. Cambridge, Massachusetts. 438 pp.
Díaz, M. (1994a). Calandra Lark *Melanocorypha calandra*. Pp. 352-353 in: Tucker & Heath (1994).
Díaz, M. (1994b). Short-toed Lark *Calandrella brachydactyla*. Pp. 356-357 in: Tucker & Heath (1994).
Díaz, M. (1994c). Crested Lark *Galerida cristata*. Pp. 360-361 in: Tucker & Heath (1994).
Díaz, M. (2003a). Cogujada Común *Galerida cristata*. Pp. 372-373 in: Martí & del Moral (2003).
Díaz, M. (2003b). Cogujada Montesina *Galerida theklae*. Pp. 374-375 in: Martí & del Moral (2003).
Dick, J.A. (1991). Grey-tailed Piha in Colombia. *Bull. Brit. Orn. Club* **111(3)**: 172.
Dickerman, R.W. (1964). Notes on the Horned Larks of western Minnesota and the Great Plains. *Auk* **81(3)**: 430-432.
Dickerman, R.W. (1985). A new subspecies of *Mecocerculus leucophrys* from Venezuela. *Bull. Brit. Orn. Club* **105(2)**: 73-75.
Dickerman, R.W. (1987). Tres nuevas atrapamoscas del Cerro de la Neblina, territorio Amazonas, Venezuela. *Bol. Soc. Venez. Cienc. Nat.* **144**: 27-32.
Dickerman, R.W. (1997). *The Era of Allan R. Phillips: a Festschrift*. Horizon Communications, Albuquerque.
Dickerman, R.W. & Parkes, K.C. (1997). Taxa described by Allan R. Phillips, 1939-1994: a critical list. Pp. 211-234 in: Dickerman (1997).
Dickerman, R.W. & Phelps, W.H. Jr. (1987). Tres nuevos atrapamoscas (Tyrannidae) del Cerro de la Neblina territorio Amazonas, Venezuela. *Bol. Soc. Venez. Cienc. Nat.* **41(144)**: 27-32.
Dickerman, R.W. & Phillips, A.R. (1953). First United States record of *Myiarchus nuttingi*. *Condor* **55(2)**: 101-102.
Dickermann, R.W., Zink, R.M. & Frye, S.L. (1980). Migration of the Purple Martin in southern Mexico. *Western Birds* **11(4)**: 203-204.
Dickey, D.R. & van Rossem, A.J. (1938). *The Birds of El Salvador*. Field Museum of Natural History (Zoological Series) **23(406)**. 609 pp.
Dickie, I.R. & Vinicombe, K.E. (1995). Lesser Short-toed Lark in Dorset: new to Britain. *British Birds* **88(12)**: 593-598.
Dickinson, E.C. (1986). Does the White-eyed River-martin *Pseudochelidon sirintarae* breed in China? *Forktail* **2**: 95-96.
Dickinson, E.C. & Dekker, R.W.R.J. (2001a). Systematic notes on Asian birds. 11. A preliminary review of the Alaudidae. Pp. 61-84 in: Dekker & Dickinson (2001b).
Dickinson, E.C. & Dekker, R.W.R.J. (2001b). Systematic notes on Asian birds. 13. A preliminary review of the Hirundinidae. Pp. 127-144 in: Dekker & Dickinson (2001b).
Dickinson, E.C. & Ericson, P.G.P. (2002). Systematic notes on Asian birds. 32. The type locality of *Hirundo daurica* Laxmann, 1769. Pp. 205-206 in: Dekker, R.W.R.J. & Dickinson, E.C. eds. (2002). *Systematic Notes on Asian Birds 22-33*. Zoologische Verhandelingen **340**. Nationaal Natuurhistorisch Museum, Leiden.
Dickinson, E.C., Dekker, R.W.R.J., Eck, S. & Somadikarta, S. (2001). Systematic notes on Asian birds. 12. Types of the Alaudidae. Pp. 85–126 in: Dekker & Dickinson (2001b).
Dickinson, E.C., Dekker, R.W.R.J., Eck, S., Somadikarta, S., Kalyakin, M., Loskot, V., Morioka, H., Violani, C., Voisin, C. & Voisin, J.F. (2001). Systematic notes on Asian birds. 14. Types of the Hirundinidae. Pp. 145-166 in: Dekker & Dickinson (2001b).
Dickinson, E.C., Eck, S. & Milensky, C.M. (2002). Systematic notes on Asian birds. 31. Eastern races of the Barn Swallow *Hirundo rustica* Linnaeus, 1758. Pp. 201-203 in: Dekker, R.W.R.J. & Dickinson, E.C. eds. (2002). *Systematic Notes on Asian Birds 22-33*. Zoologische Verhandelingen **340**. Nationaal Natuurhistorisch Museum, Leiden.
Dickinson, E.C., Kennedy, R.S. & Parkes, K.C. (1991). *The Birds of the Philippines. An Annotated Check-list*. BOU Check-list **12**. British Ornithologists' Union, Tring, UK.
Dierschke, J. (2001). Herkunft, Zugwege und Populationsgrösse in Europa überwinternder Ohrenlerchen (*Eremophila alpestris*), Schneeammern (*Plectrophenax nivalis*) und Berghänflinge (*Carduelis flavirostris*). [Origin, migration routes and population size of Shorelarks (*Eremophila alpestris*), Snow Buntings (*Plectrophenax nivalis*) and Twites (*Carduelis flavirostris*) wintering in Europe]. *Vogelwarte* **41(1)**: 31-43.
Dierschke, J. (2002a). Food preferences of Shorelarks *Eremophila alpestris*, Snow Buntings *Plectrophenaic nivallis* and Twites *Carduelis flavirostris* wintering in the Wadden Sea. *Bird Study* **49**: 263-269.
Dierschke, J. (2002b). Die Überwinterungsökologie von Ohrenlerchen (*Eremophila alpestris*), Schneeammern (*Plectrophenax nivalis*) und Berghänflingen (*Carduelis flavirostris*) im Wattenmeer. *J. Orn.* **143(1)**: 107-115.
Dierschke, J. (2002c). Vorkommen und Habitatwahl des Strandpiepers *Anthus petrosus* im Deutschen Wattenmeer. [Occurrence and habitat use of Rock Pipit *Anthus petrosus* in the German Wadden Sea]. *Vogelwelt* **123(3)**: 125-134.
Dierschke, J. & Bairlein, F. (2002). Why did granivorous passerines wintering in Wadden salt marshes decline? *Ardea* **90**: 471-477.
Dierschke, V. (1994). Rufaktivität ziehender Baumpieper *Anthus trivialis* und Schafstelzen *Motacilla flava*. [Calling activity of migrating Tree Pipits *Anthus trivialis* and Yellow Wagtails *Motacilla flava*]. *Vogelwelt* **115(1)**: 15-18. In German with English summary.
Dierschke, V. & Dierschke, J. (1991). [Migration of Red-throated Pipit *Anthus cervinus* through central Europe]. *Limicola* **5(6)**: 281-286, 288-296, 298. In German with English summary.
Diesselhorst, G. (1973). Notiz zum Verhalten des Leierschwanzes (*Menura novaehollandiae*). [Report on the behavior of *Menura novaehollandiae*]. *J. Orn.* **114(4)**: 501-503. In German with English summary.
van Dijk, J. (1975). De Engelse Gele Kwikstaart als broedvogel in Nederland. [The Yellow Wagtail as a breeding bird in The Netherlands]. *Limosa* **48(1-2)**: 86-99. In Dutch with English summary.
Dinelli, L. (1918). Notas biológicas sobre aves del noroeste de la Argentina. *Hornero* **1**: 140-147.
Dinelli, L. (1924). Notas biológicas sobre aves del noroeste de la Argentina. *Hornero* **3**: 251-258.
Dinelli, L. (1933). El tiránido *Pseudocolopteryx dinellianus* y su nido. *Hornero* **5**: 221-222.
Dinerstein, E., Olson, D.M., Graham, D.J., Webster, A.L., Primm, S.A., Bookbinder, M.P. & Ledec, G. (1995). *A Conservation Assessment of the Terrestrial Ecoregions of Lutin America and the Caribbean*. World Bank, Washington, D.C.
Disney, H.J. de S. (1988). Notes on breeding of Welcome Swallows in captivity. *Austr. Zool.* **24(4)**: 211-215.
Disney, H.J. de S. (1991). Notes on sexing and plumages of the Welcome Swallow *Hirundo neoxena*. *Corella* **15(1)**: 29-31.
Dittami, J. ed. (1994). *Proceedings of the XXI International Ornithological Congress*. Journal für Ornithologie **135(3)**.
Dixon, J. (1920). Nesting of the Olive-sided Flycatcher in Berkeley, California. *Condor* **22(6)**: 200–202.
Dobson, A.P. (2002). *A Birdwatching Guide to Bermunda*. Arlequin Press, Chelmsford, UK.
Dod, A.S. (1987). *Aves de la República Dominicana*. 2nd edition. Museo Nacional de Historia Natural, Santo Domingo.
Dod, A.S. (1992). *Endangered and Endemic Birds of the Dominican Republic*. Cypress House, Fort Bragg, California.
Dodson, C.H. & Gentry, A.H. (1991). Biological extinction in western Ecuador. *Ann. Missouri Bot. Garden* **78**: 273-295.
Dodsworth, P.T.L. (1912). The Crag Martin *Ptyonoprogne rupestris*. *J. Bombay Nat. Hist. Soc.* **21(2)**: 660-661.
Dodsworth, P.T.L. (1914). Nesting of *Anthus similis*, Jerdon (the Brown-rock Pipit). *J. Bombay Nat. Hist. Soc.* **22(4)**: 798-800.
Dolnik, O.V. & Gracheva, T.I. (1990). [Time and energy budgets of the White Wagtail (*Motacilla alba*) during chick feeding]. *Ornitologiya* **24**: 179-182. In Russian.
Dolnik, V.R. & Kinzhewskaja, L.I. (1980). Time and energy budgets during the nest period in the swift (*Apus apus*) and swallows (*Delichon urbica*, *Hirundo rustica*). *Zoologischeskii Zhurnal* **59**: 1841-1851.
Donahue, P.K. (1985). Notes on some little known or previously unrecorded birds of Suriname. *Amer. Birds* **39**: 229-230.
Donahue, P.K. & Pierson, J.E. (1982). *Birds of Suriname: an Annotated Checklist*. South Harpswell, Maine.
Donald, P.F. (2002). An unlikely survivor: the ecology and conservation of the Raso Lark *Alauda razae*. Page 248 in: Anon. (2002a). (Abstract).
Donald, P.F. (2004). *The Skylark*. T. & A.D. Poyser, London.
Donald, P.F. & Vickery, J.A. (2000). The importance of cereal fields to breeding and wintering Skylarks *Alauda arvensis* in the UK. Pp. 140-150 in: Aebischer, N.J., Evans, A.D., Grice, P.V. & Vickery, J.A. eds. (2000). *Ecology and Conservation of Lowland Farmland Birds*. Proceedings of the 1999 British Ornithologists' Union Spring Conference. British Ornithologists' Union, Tring, UK.
Donald, P.F. & Vickery, J.A. eds. (2001). *The Ecology and Conservation of Skylarks* Alauda arvensis*: Proceedings of a Conference Held at the University of Southampton, 28-29 March 1999*. RSPB, Sandy, UK.
Donald, P.F., Buckingham, D.L., Moorcroft, D., Muirhead, L.B., Evans, A.D. & Kirby, W.B. (2001). Habitat use and diet of Skylarks *Alauda arvensis* wintering on lowland farmland in southern Britain. *J. Appl. Ecol.* **38(3)**: 536-547.
Donald, P.F., Buckingham, D.L., Muirhead, L.B., Evans, A.D., Kirby, W.B. & Schmitt, S.I.A. (2001). Factors affecting clutch size, hatching rates and partial brood losses in Skylark *Alauda arvensis* nests on lowland farmland. Pp. 63-77 in: Donald & Vickery (2001).
Donald, P.F., Evans, A.D., Buckingham, D.L., Muirhead, L.B. & Wilson, J.D. (2001). Factors affecting the territory distribution of Skylarks *Alauda arvensis* breeding on lowland farmland. *Bird Study* **48**: 271-278.
Donald, P.F., Evans, A.D., Muirhead, L.B., Buckingham, D.L., Kirby, W.B. & Schmitt, S.I.A. (2002). Survival rates, causes of failure and productivity of Skylark *Alauda arvensis* nests on lowland farmland. *Ibis* **144(4)**: 652-664.
Donald, P.F., Evans, A.D., Pain, D.J., Muirhead, L.B. & Buckingham, D.L. (1998). Factors affecting nest survival rates of Skylarks *Alauda arvensis* on farmland. *Ostrich* **69**: 425-426.
Donald, P.F., Green, R.E. & Heath, M.F. (2001). Agricultural intensification and the collapse of Europe's farmland bird populations. *Proc. Royal Soc. London* **268B**: 25-29.
Donald, P.F., Muirhead, L.B., Buckingham, D.L., Evans, A.D., Kirby, W.B. & Gruar, D.J. (2001). Body condition, growth rates and diet of Skylark *Alauda arvensis* nestlings on lowland farmland. *Ibis* **143(4)**: 658-669.
Donald, P.F., de Ponte, M., Pitta Groz, M.J. & Taylor, R. (2003). Status, ecology, behaviour and conservation of Raso Lark *Alauda razae*. *Bird Conserv. Int.* **13**: 13-28.
Donnelly, A.V. (1976). They are at it again! *Bull. East Afr. Nat. Hist. Soc.* **1976**: 62-63.

Donnelly, A.V. (1977). More and more *Motacilla alba vidua*. *Bull. East Afr. Nat. Hist. Soc.* **1977**: 4-5.
Donnelly, A.V. (1978). A year of wagtails, African Pied Wagtails - *Motacilla aguimp*. *Bull. East Afr. Nat. Hist. Soc.*: 27-30.
Donnelly, B.G. (1982). First record of the Short-tailed Pipit in Zimbabwe. *Honeyguide* **110**: 45.
Dorn, J.L. & Dorn, R.D. (1990). *Wyoming Birds*. Mountain West Publications. Cheyenne, Wyoming.
Dorst, J. ed. (1976). *Proceedings of the XVI International Ornithological Congress, Canberra, 1974*. Australian Academy of Science, Canberra.
Dorst, J. & Pasteur, G. (1954). Les Cochevis (*Galerida*) du Maroc (Oiseaux, Alaudidés). *Bull. Soc. Sci. Nat. Phys. Maroc* **34**: 255-261.
Dougall, T.W. (1991). Winter distribution and associated movements of northern Pied Wagtails *Motacilla alba yarrellii*, as shown by ringing. *Ringing & Migration* **12(1)**: 1-15.
Dougall, T.W. (1992). Post-fledging dispersal of British Pied Wagtails *Motacilla alba yarrellii*. *Ringing & Migration* **13(1)**: 21-26.
Dougall, T.W. (1993). Post-juvenile moult and dispersal in the Meadow Pipit *Anthus pratensis*. *Ringing & Migration* **14(3)**: 137-142.
Dougall, T.W. (1995). Post-fledging dispersal of British Wagtails (*Motacilla alba yarrellii*) a re-appraisal with comparative notes. *Ring* **17(1-2)**: 91-96.
Dougall, T.W. (1996). Movement and mortality of British-ringed Skylarks *Alauda arvensis*. *Ringing & Migration* **17(2)**: 81-92.
Dougall, T.W. (1997). Biometrics and sex ratios of Skylarks *Alauda arvensis* in winter in south-east Scotland. *Ringing & Migration* **18(1)**: 37-49.
Dougall, T.W. (1998). Wing length and undertail covert markings in the Skylark *Alauda arvensis* - a museum perspective. *Ringing & Migration* **19(2)**: 86-90.
Dougall, T.W. (1999). Mass and visible fat scores of Skylarks *Alauda arvensis* in winter in south-east Scotland. *Ringing & Migration* **19(4)**: 283-297.
Dougall, T.W. (2002a). Meadow Pipit *Anthus pratensis*. Pp. 470-473 in: Wernham *et al.* (2002).
Dougall, T.W. (2002b). Pied Wagtail *Motacilla alba*. Pp. 483-486 in: Wernham *et al.* (2002).
Doughty, C., Day, N. & Plant, A. (1999). *Birds of The Solomons, Vanuatu & New Caledonia*. Christopher Helm, London.
Doughty, R. & Fergus, R. (2002). *The Purple Martin*. University of Texas Press, Austin.
Downer, A. (1982). Is the Golden Swallow declining? *Gosse Bird Club Broadsheet* **39**: 13.
Downer, A. (1986). Caribbean Martin. *Gosse Bird Club Broadsheet* **46**: 9.
Downer, A. (1987). Caribbean Martins. *Gosse Bird Club Broadsheet* **48**: 13; **49**: 17.
Downer, A. & Sutton, R. (1990). *Birds of Jamaica: a Photographic Field Guide*. Cambridge University Press, Cambridge.
Downhower, J.F. & Windsor, D. (1971). Use of landmarks in orientation by Bank Swallows. *BioScience* **21**: 570-572.
Dowsett, R.J. (1965). The occurrence of the Yellow Wagtail *Motacilla flava* in central Africa. *Ostrich* **36**: 32-33.
Dowsett, R.J. (1971). Suspended wing-moult of migrants. *Bird Study* **18**: 53-54.
Dowsett, R.J. (1972a). Geographical variation in *Pseudhirundo griseopyga*. *Bull. Brit. Orn. Club* **92(3&4)**: 97-100.
Dowsett, R.J. (1972b). Races of the lark *Mirafra africana* in the Tanganyika-Nyasa montane group. *Bull. Brit. Orn. Club* **92(6)**: 156-159.
Dowsett, R.J. (1979). Recent additions to the Zambian list. *Bull. Brit. Orn. Club* **99(3)**: 94-98.
Dowsett, R.J. (1983). Fischer's Finch Lark (*Eremopterix leucopareia*) in Kasungu District. *Nyala* **9(1-2)**: 57-58.
Dowsett, R.J. ed. (1989). *Enquête Faunistique dans la Forêt du Mayombe et Check-liste des Oiseaux et des Mammifères du Congo*. Tauraco Research Report **2**. Tauraco Press, Liège, Belgium.
Dowsett, R.J. ed. (1990). *Enquête Faunistique et Floristique dans la Forêt de Nyungwe au Rwanda. Survey of the Fauna and Flora of Nyungwe Forest, Rwanda*. Tauraco Research Report **3**. Tauraco Press, Liège, Belgium. In French and English.
Dowsett, R.J. & Dowsett-Lemaire, F. (1978). Fuelleborn's Longclaw (*Macronyx fuelleborni*) in eastern Isoka District. *Bull. Zambian Orn. Soc.* **10**: 77.
Dowsett, R.J. & Dowsett-Lemaire, F. (1980). The systematic status of some Zambian birds. *Gerfaut* **70**: 151-200.
Dowsett, R.J. & Dowsett-Lemaire, F. (1986). Letter to the editor: Long-billed Pipit systematics. *Ostrich* **57(2)**: 115.
Dowsett, R.J. & Dowsett-Lemaire, F. (1987). Long-billed Pipit systematics. *Ostrich* **58(1)**: 46.
Dowsett, R.J. & Dowsett-Lemaire, F. eds. (1991). *Flore et Faune du Bassin du Kouilou (Congo) et leur Exploitation. Flora and Fauna of the Kouilou Basin (Congo) and their Exploitation*. Tauraco Research Report **4**. Tauraco Press, Liège, Belgium. In French and English.
Dowsett, R.J. & Dowsett-Lemaire, F. (1993). *A Contribution to the Distribution and Taxonomy of Afrotropical and Malagasy Birds*. Tauraco Research Report **5**. Tauraco Press, Liège, Belgium.
Dowsett, R.J. & Dowsett-Lemaire, F. (1997). *Flore et Faune du Parc National d'Odzala, Congo. Flora and Fauna of the Odzala National Park, Congo*. Tauraco Research Report **6**. Tauraco Press, Liège, Belgium. In French and English.
Dowsett, R.J. & Forbes-Watson, A.D. (1993). *Checklist of Birds of the Afrotropical and Malagasy Regions*. Vol. 1. Species Limits and Distribution. Tauraco Press, Liège, Belgium.
Dowsett, R.J., Christy, P. & Germain, M. (1999). Additions and corrections to the avifauna of Central African Republic. *Malimbus* **21**: 1-15.
Dowsett-Lemaire, F. (1989). On the voice of the Mountain Pipit. *Ostrich* **60(2)**: 85-87.
Dowsett-Lemaire, F. & Dowsett, R.J. (1978). Vocal mimicry in the lark *Mirafra hypermetra* as a possible species-isolating mechanism. *Bull. Brit. Orn. Club* **98(4)**: 140-144.
Draffan, R.D.W., Garnett, S.T. & Malone, G. (1983). Birds of the Torres Straits. *Emu* **83**: 207-234.
Drake, J. (1985). A macabre swallow nest. *Notornis* **32(2)**: 94.
Drijvers, R., Barker, C., Bean, N., Davidson, P. & Showler, D. (1999). Olive-backed Pipit *Anthus hodgsoni*: a new species for Pakistan. *Forktail* **15**: 98.
Drury, W.H. (1961). Studies on the breeding biology of Horned Lark, Water Pipit, Lapland Longspur and Snow Bunting on Bylot Island, Northwest Territories, Canada. *Bird Banding* **32**: 1-46.
Duboc, P. (1999). Hirondelle de rivage *Riparia riparia*. Pp. 422-423 in: Rocamora & Yeatman-Berthelot (1999).
DuBois, A.D. (1935). Nests of Horned Larks and longspurs on a Montana prairie. *Condor* **37(2)**: 56-72.
DuBois, A.D. (1936). Habits and nest life of the Desert Horned Lark. *Condor* **38(2)**: 49-56.
Dubois, P.J. (2001). Les formes nicheuses de la Bergeronnette printanière *Motacilla flava* en France. *Ornithos* **8(2)**: 44-73.
Dubois, P.J., Le Marechal, P., Olioso, G. & Yésou, P. (2000). *Inventaire des Oiseaux de France. Avifaune de la France Métropolitaine*. Nathan, Paris.
Dubs, B. (1992). *Birds of Southwestern Brazil: Catalogue and Guide to the Birds of the Pantanal of Mato Grosso and its Border Areas*. Betrona Verlag, Küsnacht, Switzerland.
Duce, S. & Brannian, J. (1990). Social behavior of the Guianan Cock-of-the-rock (*Rupicola rupicola*) in captivity. *Zoo Biology* **9(3)**: 223-232.
Duckworth, J.W. & Hedges, S. (1998). Bird records from Cambodia in 1997, including records of sixteen species new for the country. *Forktail* **14**: 29-36.
Duckworth, J.W., Alström, P., Davidson, P., Evans, T.D., Poole, C.M., Setha, T. & Timmins, R.J. (2001). A new species of wagtail from the lower Mekong basin. *Bull. Brit. Orn. Club* **121(3)**: 152-182.
Duckworth, J.W., Salter, R.E. & Khounboline, K. eds. (1999). *Wildlife in Lao PDR: 1999 Status Report*. IUCN-The World Conservation Union, Wildlife Conservation Society & Centre for Protected Areas and Watershed Management, Vientiane.
Duckworth, J.W., Tizard, R.J., Timmins, R.J., Thewlis, R.M., Robichaud, W.G. & Evans, T.D. (1998). Bird records from Laos, October 1994-August 1995. *Forktail* **13**: 33-68.
Dujardin, J.L. (1987). Découverte du nid et de la ponte du Manakin à front blanc (*Pipra serena*). *Oiseau* **57**: 57-58.
Dulau, S. (1997). Nouveau cas d'hivernage du Pipit de Richard *Anthus richardi* dans le sud de la France. [Wintering of Richard's Pipit in southwestern France]. *Ornithos* **4(2)**: 90-91.
Dunajewski, A. (1939). O kilku ciekawszych ptakach z Peru (Passeriformes). *Acta Orn., Warszawa* **3(2)**: 7-15.
Duncan, N. (1981). Rock Pipit feeding on fish. *Bird Study* **28**: 186.
Duncan, R.A. (1988). The Olive-sided Flycatcher, a rare but regular migrant in northwest Florida. *Florida Field Nat.* **16**: 72–74.
Dunckley, J.V. & Todd, C.M. (1949). Birds west of the Waiau River. *New Zealand Bird Notes* **3**: 163-164.
Dunn, E. (1994). Species of European conservation concern, category 4. Pp. 439-469 in: Tucker & Heath (1994).
Dunn, E.H. (1979). Age of effective homeothermy in nestling Tree Swallows, *Iridoprocne bicolor*, according to brood size. *Wilson Bull.* **91(3)**: 455-457.
Dunn, E.H., Hussell, D.J.T. & Welsh, D.A. (1999). Priority setting tool applied to Canada's landbirds based on concerns and responsibilities for species. *Conserv. Biol.* **13**: 1404–1415.
Dunn, P.O. & Hannon, S.J. (1991). Intraspecific competition and the maintenance of monogamy in Tree Swallows. *Behav. Ecol.* **2**: 258-266.
Dunn, P.O. & Hannon, S.J. (1992). Effects of food abundance and male parental care on reproductive success and monogamy in Tree Swallows. *Auk* **109(3)**: 488-499.
Dunn, P.O. & Robertson, R.J. (1992). Geographic variation in the importance of male parental care and mating systems in Tree Swallows. *Behav. Ecol.* **3**: 291-299.
Dunn, P.O. & Robertson, R.J. (1993). Extra-pair paternity in polygynous Tree Swallows. *Anim. Behav.* **45**: 231-239.
Dunn, P.O. & Winkler, D.W. (1999). Climate change has affected breeding date of Tree Swallows throughout North America. *Proc. Royal Soc. London* **226B**: 2487-2490.
Dunn, P.O., Robertson, P.J., Michaud-Freeman, D. & Boag, P.T. (1994). Extra-pair paternity in Tree Swallows: why do females mate with more than one male? *Behav. Ecol. Sociobiol.* **35**: 273-281.
Dunn, P.O., Thusius, K.J., Kimber, K. & Winkler, D.W. (2000). Geographic and ecological variation in clutch size of Tree Swallows. *Auk* **117(1)**: 215-221.
Dunn, P.O., Whittingham, L.A., Lifjeld, J.T., Robertson, R.J. & Boag, P.T. (1994). Effects of breeding density, synchrony, and experience on extrapair paternity in Tree Swallows. *Behav. Ecol.* **5**: 123-129.
Dunning, J.B. (1984). *Body Weights of 686 Species of North American Birds*. Western Bird Banding Association Monograph **1**. Eldon Publishers, Cave Creek, Arizona.
Dunning, J.B. (1989). Gregariousness of Blue Swallows *Hirundo atrocaerulea* during nest building. *Ostrich* **60(3)**: 135-136.
Dunning, J.B. (1992). *Handbook of Avian Body Weights*. CRC Press, Orlando, Florida.
Dunning, J.B. ed. (1993). *CRC Handbook of Avian Body Masses*. CRC Press, Boca Raton, Florida.
Dunning, J.B. & Bowers, R.K. (1990). Lethal temperatures in Ash-throated Flycatcher nests located in metal fence poles. *J. Field Orn.* **61**: 98-103.
Dupuy, A. (1969). Catalogue ornithologique du Sahara algérien. *Oiseau et RFO* **39**: 140-160.
Dutson, G.C.L. & Branscombe, J. (1990). *Rainforest Birds in South-west Ghana*. ICBP Study Report **46**. Cambridge.
Dwarshuis, S.N. (1980). [Crested Lark (*Galerida cristata*) breeds on a flat roof]. *Vogeljaar* **28(1)**: 41.
Dwight, J. (1890). The Horned Larks of North America. *Auk* **7(2)**: 138-158.
Dyck, J. (1971). Structure and colour-production of the blue barbs of *Agapornis roseicollis* and *Cotinga maynana*. *Z. Zellforsch. Mikrosk. Anat.* **115(1)**: 17-29.
Dyer, M. (1988). Nuptial flight display of the Blue Swallow (*Hirundo atrocaerulea*). *Nyala* **12(1/2)**: 27-30.
Dyrcz, A. (1984). Breeding biology of the Mangrove Swallow (*Tachycineta albilinea*) and the Grey-breasted Martin (*Progne chalybea*) at Barro Colorado Island, Panama. *Ibis* **126(1)**: 59-66.
Dyrcz, A. (2000a). Nesting of the Mangrove Swallow (*Tachycineta albilinea*) in nests of the Rusty-margined (*Myozetetes cayanensis*) and Social (*M. similis*) Flycatchers. *Orn. Neotropical* **11**: 83-84.
Dyrcz, A. (2000b). Observations at nests of the Lesser Kiskadee (*Philohydor lictor*) on Barro Colorado Island (Republic of Panama). *Orn. Neotropical* **11**: 359-362.
Dyrcz, A. (2002). Breeding ecology of the Social (*Myiozetetes similis*) and Rusty-margined (*M. cayanensis*) Flycatchers at Barro Colorado Island, Republic of Panama. [Ecología de la reproducción del Pitirre Copete Rojo (*Myiozetetes similis*) y del Atrapamoscas Pecho Amarillo (*M. cayanensis*) en la Isla Barro Colorado en la República de Panamá]. *Orn. Neotropical* **13**: 143-151. In English with Spanish summary.
Dyrnev, Y.A., Siroklin, I.N. & Sonin, V.D. (1983). [Materials to the ecology of *Delichon dasypus* (Passeriformes, Hirundinidae) on Khamar-Daban (south Baikal territory)]. *Zoologischeskii Zhurnal* **62**: 1541-1546. In Russian.
Dyson, W.G. (1976). Twice-yearly breeding of small birds at Muguga, Kenya. *Bull. East Afr. Nat. Hist. Soc.* **1976**: 132-134.
Dzerzhinsky, F.Y. & Yesilevskaya, M.A. (1986). The morpho-functional properties of the feeding apparatus in the Skylark (*Alauda arvensis*). *Zoologischeskii Zhurnal* **65(8)**: 1218-1227.
Eames, J.C. & Ericson, P.G.P. (1996). The Björkegren expeditions to French Indochina: a collection of birds from Vietnam and Cambodia. *Nat. Hist. Bull. Siam Soc.* **44**: 75-111.
Eames, J.C. & Robson, C.R. (1992). *Forest Bird Surveys in Vietnam 1991*. BirdLife Study Report **51**. BirdLife International, Cambridge.
Eames, J.C., Eve, R. & Tordoff, A.W. (2001). The importance of Vu Quang Nature Reserve, Vietnam, for bird conservation, in the context of the Annamese Lowlands Endemic Bird Area. *Bird Conserv. Int.* **11(4)**: 247-285.
Earlé, R.A. (1984). "Fishing" for Cliff Swallows. *Safring News* **13(1)**: 6-9.
Earlé, R.A. (1985a). Predators, parasites and symbionts of the South African Cliff Swallow *Hirundo spilodera* (Aves: Hirundinidae). *Navors. Nat. Mus. Bloemfontein* **5(1)**: 1-18. In English with Afrikaans summary.
Earlé, R.A. (1985b). The nest of the South African Cliff Swallow *Hirundo spilodera* (Aves: Hirundinidae). *Navors. Nat. Mus. Bloemfontein* **5(2)**: 21-36.
Earlé, R.A. (1985c). A description of the social, aggressive and maintenance behaviour of the South African Cliff Swallow *Hirundo spilodera* (Aves: Hirundinidae). *Navors. Nat. Mus. Bloemfontein* **5(3)**: 37-50.
Earlé, R.A. (1985d). Foraging behaviour and diet of the South African Cliff Swallow *Hirundo spilodera* (Aves: Hirundinidae). *Navors. Nat. Mus. Bloemfontein* **5(4)**: 53-66.
Earlé, R.A. (1985e). Ageing and sexing guide: South African Cliff Swallow *Hirundo spilodera*. *Safring News* **14(1)**: 48.
Earlé, R.A. (1985f). *The Biology of the South African Cliff Swallow* Hirundo spilodera. PhD thesis, Rhodes University, Grahamstown, South Africa.
Earlé, R.A. (1986a). The breeding biology of the South African Cliff Swallow. *Ostrich* **57(3)**: 138-156.
Earlé, R.A. (1986b). Vocalisations of the South African Cliff Swallow, *Hirundo spilodera*. *S. Afr. J. Zool.* **21(3)**: 229-232.
Earlé, R.A. (1986c). Time budget of South African Cliff Swallows during breeding. *S. Afr. J. Zool.* **21(1)**: 57-59.
Earlé, R.A. (1986d). Dimensions and deformities of South African Cliff Swallows. *Ostrich* **57(1)**: 56-59.
Earlé, R.A. (1986e). Reproductive output of an urban pair of Cape Wagtails *Motacilla capensis*. *Mirafra* **3(3)**: 44-46.
Earlé, R.A. (1987a). Distribution, migration and timing of moult in the South African Cliff Swallow. *Ostrich* **58(3)**: 118-121.
Earlé, R.A. (1987b). Moult and breeding seasons of the Grey-rumped Swallow. *Ostrich* **58**. 181-182.
Earlé, R.A. (1987c). Measurements, moult and timing of breeding in the Blue Swallow. *Ostrich* **58(4)**: 182-185.
Earlé, R.A. (1987d). Ringing and recovery details of four southern African swallow species. *Safring News* **16**: 67-72.
Earlé, R.A. (1987e). Notes on *Hirundo fuliginosa* and its status as a "Cliff Swallow". *Bull. Brit. Orn. Club* **107(2)**: 59-63.
Earlé, R.A. (1987f). A case of bigamy in the Redbreasted Swallow *Hirundo semirufa*. *S. Afr. J. Zool.* **22(4)**: 325-326.
Earlé, R.A. (1987g). Homing ability of the South African Cliff Swallow. *Safring News* **16(1)**: 3-7.
Earlé, R.A. (1987h). Nest eviction of Greater Striped Swallows by Anteating Chats. *Mirafra* **4(2)**: 35-36
Earlé, R.A. (1988a). The timing of breeding and moult in three African swallows (Aves: Hirundinidae). *Rev. Zool. Afr.* **102(1)**: 61-70.
Earlé, R.A. (1988b). Nest rotation by White-throated Swallows *Hirundo albigularis* during the breeding season *Hirundo* **1**: 11-12.
Earlé, R.A. (1988c). The timing of breeding and moult of the Lesser Striped Swallow *Hirundo abyssinica*. *Ibis* **130(3)**: 378-383.
Earlé, R.A. (1989). Breeding biology of the Redbreasted Swallow *Hirundo semirufa*. *Ostrich* **60(1)**: 13-21.
Earlé, R.A. & Brooke, R.K. (1988). South African Cliff Swallows overwintering near Bloemfontein. *Mirafra* **5**: 53.
Earlé, R.A. & Brooke, R.K. (1989). Taxonomy, distribution, migration and moult of the Redbreasted Swallow *Hirundo semirufa*. *Ostrich* **60(4)**: 151-158.
Earlé, R.A. & Underhill, L.G. (1991). The effects of brood size on growth of South African Cliff Swallow *Hirundo spilodera* chicks. *Ostrich* **62(1/2)**: 13-22.
Ebenhöh, H. & Gatter, W. (1991). Zum Wegzug des Wiesenpiepers *Anthus pratensis* am Randecker Maar. [Autumn migration of Meadow Pipits (*Anthus pratensis*) on the Randecker Maar]. *Vogelwelt* **112(3)**: 118-140.
Eck, S. (1973). Neue Feststellungen zur Morphologie der Feldlerchen (*Alauda* L.). *Naturkd. Jber. Mus. Heineanum* **8**: 19-29.
Eckert, J. (1995). The Singing Bushlark *Mirafra javanica* in the south east of South Australia. *South Austr. Orn.* **32(3)**: 53-57.
Eckert, K. (1999). A migrant Sprague's Pipit in late October. *Loon* **71(1)**: 53-54.
Eckhardt, R.C. (1977). Effects of a late spring storm on a local Dusky Flycatcher population. *Auk* **94**: 362.
Eckhardt, R.C. (1979). The adaptive syndromes of two guilds of insectivorous birds in the Colorado Rocky Mountains. *Ecol. Monogr.* **49**: 129-149.
Edgar, A.T. (1949). Winter notes on New Zealand birds. *New Zealand Bird Notes* **3**: 170-174.
Edgar, A.T. (1962). Welcome Swallows in Northland. *Notornis* **9(8)**: 293-294.
Edgar, A.T. (1966). Welcome Swallows in New Zealand 1958-1965. *Notornis* **13(1)**: 27-60.
Ednie, A.P. (1994). Delaware's first successful nesting of Cliff Swallow. *Delmarva Orn.* **26**: 3-4.
Edqvist, J. (1979). Citronarlehane matar ungar I Jamtland 1977. [Citrine Wagtail feeding young in Jamtland, North Sweden]. *Vår Fågelvärld* **38(1)**: 47. In Swedish with English summary.

Edson, J.M. (1930). Recession in weight of nestling birds. *Condor* **32(3)**: 137-140.
Edson, J.M. (1943). A study of the Violet-green Swallow. *Auk* **60(3)**: 396-403.
Edwards, E.A. (1999). Fledging and other notes on the Grassveld Pipit. *Honeyguide* **45(2)**: 148-149.
Edwards, E.O. (1948). Have the White-backed Swallows their "territories"? *Emu* **47**: 314.
Edwards, E.P. (1972). *A Field Guide to the Birds of Mexico*. Ernest P. Edwards, Sweet Briar, Virginia.
Edwards, H.V. (1919). The nesting of lyrebirds. *Emu* **18**: 298-299.
Edwards, S.J. (1988). African Pied Wagtails taking bream fry. *Honeyguide* **34**: 132.
Edwards, S.V. & Boles, W.E. (2002). Out of Gondwana: the origin of passerine birds. *Trends Ecol. Evol.* **17(8)**: 347-349.
van Ee, C. (1988). Saamboer by voëls / Cohabitation among birds. *Mirafra* **5(3)**: 53-54.
Ehrich, D. (1997). Zur Brutbiologie von Spornammer *Calcarius laponicus*, Ohrenlerche *Eremophila alpestris* und Schneeammer *Plectrophenax nivalis* in der arktischen Tundra West-Taimyrs (Sibirien). [Breeding biology of Lapland Bunting *Calcarius laponicus*, Shore Lark *Eremophila alpestris* and Snow Bunting *Plectrophenax nivalis* in the arctic tundra of West-Taymyr (Siberia)]. *Orn. Beob.* **94(3)**: 209-224.
Ehrlich, P.R., Dobkin, D.S. & Wheye, D. (1992). *Birds in Jeopardy. The Imperiled and Extinct Birds of the United States and Canada, Including Hawaii and Puerto Rico*. Stanford University Press, Stanford, California.
Eike, J.W. (1978). Cassin's Kingbird near Clifton, Virginia. *Raven* **49(1)**: 12-13.
Eisenmann, E. (1955). *The Species of Middle American Birds*. Transactions of the Linnean Society of New York **7**. 128 pp.
Eisenmann, E. (1959). South American migrant swallows of the genus *Progne* in Panama and northern South America with comments on their identification and molt. *Auk* **76(4)**: 528-532.
Eisenmann, E. & Haverschmidt, F. (1970). Northward migration to Surinam of South American martins (*Progne*). *Condor* **72(3)**: 368-369.
Eisentraut, M. (1956). Notizen über einige Vögel des Kamerungsgebirges. *J. Orn.* **97**: 291-300.
Eisentraut, M. (1963). *Die Wiebeltiere des Kamerungebirges*. Paul Parey, Hamburg.
Ekert, P. (2000). Monitoring Rufous Scrub-birds (*Atrichornis rufescens*) in north east New South Wales. Unpublished report for the New South Wales National Parks and Wildlife Service, Sydney.
Eksteen, J.P. (1994). Breeding habits of the Blue Swallow in the south-eastern Transvaal. *Birding in SA* **46**: 68.
Elfström, S.T. (1990). Individual and species-specific song patterns of Rock and Meadow Pipits: physical characteristics and experiments. *Bioacoustics* **2(4)**: 277-301.
Elfström, S.T. (1992). Tsip calls of Meadow and Rock Pipits: interspecific comparisons and playback experiments. *Anim. Behav.* **43(5)**: 795-802.
Elfström, S.T. (1997). Fighting behaviour and strategy of Rock Pipit, *Anthus petrosus*, neighbours: cooperative defence. *Anim. Behav.* **54(3)**: 535-542.
Elgood, J.H., Fry, C.H. & Dowsett, R.J. (1973). African migrants in Nigeria. *Ibis* **115(1)**: 1-45; **115(3)**: 375-411.
Elgood, J.H., Heigham, J.B., Moore, A.M., Nason, A.M., Sharland, R.E. & Skinner, N.J. (1994). *The Birds of Nigeria. An Annotated Check-list*. BOU Check-list **4**. British Ornithologists' Union, Tring, UK.
Elgood, J.H., Sharland, R.E. & Ward, P. (1966). Palearctic migrants in Nigeria. *Ibis* **108(1)**: 84-116.
Elkins, N. & Etheridge, B. (1974). The Crag Martin in winter quarters at Gibraltar. *British Birds* **67**: 376-387.
Ellegren, H., Lindgren, G., Primmer, C.R. & Møller, A.P. (1997). Fitness loss and germline mutations in Barn Swallows breeding in Chernobyl. *Nature* **389**: 593-596.
Elliott, J.J. (1939). Wintering Tree Swallows at Jones Beach, fall and winter 1938 and 1939. *Bird Lore* **41**: 11-16.
Ellis, J.H. (1982). The thermal nest environment and parental behavior of a burrowing bird, the Bank Swallow. *Condor* **84(4)**: 441-443.
Elmegaard, N., Andersen, P.N., Odderskaer, P. & Prang, A. (1999). Food supply and breeding activity of Skylarks in fields with different pesticide treatment. Pp. 1058-1069 in: Adams & Slotow (1999).
Elphick, C., Dunning, J.B. & Sibley, D. eds. (2001). *The Sibley Guide to Bird Life & Behaviour*. Christopher Helm, London.
van der Elst, D. (1993). [The status of the Water Pipit (*Anthus spinoletta*) in Wallonia]. *Aves* **30(1)**: 1-16. In French with English, Dutch, and German summary.
Elstrodt, W. & Zucchi, H. (1991). Zur räumlichen und zeitlichen Habitatnutzung sowie zur Brutbiologie der Gebergstelze (*Motacilla cinerea* Tunstall 1771). [Spatial and temporal habitat utilization and breeding biology of Grey Wagtail (*Motacilla cinerea* Tunstall 1771)]. *Okol. Vögel* **13(2)**: 159-179. In German with English summary.
Ely, C.A. (1970). Migration of Least and Traill's Flycatchers in west-central Kansas. *Bird-Banding* **41**: 198-203.
van den Elzen, R. (1975). Zur Kenntnis der Avifauna Kameruns. [On the birds of Cameroon]. *Bonn. Zool. Beitr.* **26(1-3)**: 49-75.
Emlen, J.T. (1952). Social behavior in nesting Cliff Swallows. *Condor* **54(4)**: 177-199.
Emlen, J.T. (1954). Territory, nest building, and pair formation in the Cliff Swallow. *Auk* **71(1)**: 16-35.
Emlen, J.T. (1977). *Land Bird Communities of Grand Bahama Island: the Structure and Dynamics of an Avifauna*. Ornithological Monographs **24**. American Ornithologists' Union, Washington, D.C.
Emlen, J.T. (1986). Responses of breeding Cliff Swallows to nidicolous parasite infestations. *Condor* **88(1)**: 110-111.
Emlen, S.T. (1971). Adaptive aspects of coloniality in the Bank Swallow. *Amer. Zool.* **11**: 47. (Abstract).
Emlen, S.T. & Demong, N.J. (1975). Adaptive significance of synchronized breeding in a colonial bird: a new hypothesis. *Science* **188**: 1029-1031.
Emley, D.W. (1985). Unusual calls at Pied Wagtail roost. *British Birds* **78**: 110.
Emslie, S.D. (1985). The late Pleistocene (Rancholabrean) avifauna of Little Box Elder Cave, Wyoming. *Univ. Wyoming Contrib. Geol.* **23**: 63-82.
Endes, M. (1970). *Die Kurzzehenlerche*. A. Ziemsen Verlag, Wittenberg Lutherstadt, Germany.
Endes, M., Horváth, L. & Hüttler, B. (1967). The life history of the Hungarian Short-toed Lark *Calandrella cinerea hungarica* Horváth, 1956, in Hortobágy, Hungary. *Acta Zool. Cracoviensia* **12(14)**: 379-391.
Endler, J.A. & Théry, M. (1996). Interacting effects of lek placement, display behavior, ambient light, and color patterns in three Neotropical forest-dwelling birds. *Amer. Naturalist* **148(3)**: 421-452.
Engblom, G., Aucca, C., Ferro, G., Samochuallpa, E. & Palomino, W. (2002). The conservation of *Polylepis*-adapted birds at Abra Málaga, Cuzco, Peru. *Cotinga* **17**: 56-59.
Engelbrecht, D. (2004). Diamond in the dust: the Short-clawed Lark. *Africa. Birds & Birding* **9(3)**: 56.
Engen, S., Saether, B. & Møller, A.P. (2001). Stochastic population dynamics and time to extinction of a declining population of Barn Swallows. *J. Anim. Ecol.* **70**: 789-797.
England, M.C. (2000). The Landbird Monitoring Programme at Lamani, Belize: a preliminary assessment. *Cotinga* **13**: 32-43.
Engleman, D. (1996a). The field editor's report. *Tucan* **22(9)**: 8-9.
Engleman, D. (1996b). The field editor's report. *Tucan* **22(10)**: 9-10.
Engleman, D. (1997a). The field editor's report. *Tucan* **23(3)**: 4-6.
Engleman, D. (1997b). The field editor's report. *Tucan* **23(5)**: 4-5.
English, T. (1995). On the Melodious Larks of Somabhula and Felixburg. *Honeyguide* **41(2)**: 111.
Ennion, E.A.R. & Ennion, D. (1962). Early breeding in Tenerife. *Ibis* **104(2)**: 158-168.
Érard, C. (1975a). Variation géographique de *Mirafra gilletti* Sharpe. Description d'une espèce jumelle. *Oiseau et RFO* **45**: 293-312.
Érard, C. (1975b). Une nouvelle alouette du sud de l'Éthiopie. *Alauda* **43**: 115-124.
Érard, C. (1981). Sur les migrations de *Pseudochelidon eurystomina* Hartlaub au Gabon. *Oiseau et RFO* **51**: 244-246.
Érard, C. (1982). Le nid et la ponte de *Lipaugus vociferans*, Cotingidé, et de *Grallaria varia*, Formicariidé. *Alauda* **50(4)**: 311-313.
Érard, C. & Étchécopar, R.D. (1970). *Contribution à l'Étude des Oiseaux d'Iran (Résultats de la Mission Étchécopar, 1967)*. Mémoires du Museum National d'Histoire Naturelle Série A **66**. 146 pp.
Érard, C. & Jarry, G. (1973). A new race of Thekla Lark in Harrar, Ethiopia. *Bull. Brit. Orn. Club* **93(4)**: 139-140.
Érard, C. & Morel, G.J. (1994). La sous-espèce du Cochevis modeste *Galerida modesta* en Sénégambie. *Malimbus* **16(1)**: 56-57.
Érard, C. & de Naurois, R. (1973). A new race of Thekla Lark in Bale, Ethiopia. *Bull. Brit. Orn. Club* **93(4)**: 141-142.
Érard, C., Théry, M. & Sabatier, D. (1989). Régime alimentaire de *Rupicola rupicola* (Cotingidae) en Guyane Française: relations avec la frugivorie et la zoochorie. *Rev. Écol. (Terre Vie)* **44(1)**: 47-74.
Eraud, C. & Boutin, J.M. (2001). Application du programme ACT à la définition de l'habitat de l'Alouette des champs *Alauda arvensis* à l'échelle de la France. [Application of the ACT program to identify Skylark habitat in France]. *Alauda* **69(1)**: 63-74.
Eraud, C. & Boutin, J.M. (2002a). Sélectivité des sites de nidification et d'alimentation chez l'Alouette des champs *Alauda arvensis* en plaine céréalière. *Alauda* **70(1)**: 188-189.
Eraud, C. & Boutin, J.M. (2002b). Density and productivity of breeding Skylarks *Alauda arvensis* in relation to crop type on agricultural lands in western France. *Bird Study* **49**: 287-296.
Eraud, C., Boutin, J.M. & Roux, D. (2000). Breeding habitat of the Skylark (*Alauda arvensis*) in a Mediterranean agrosystem. *Game & Wildlife Science* **17(3)**: 147-163.
Ericson, P.G.P. & Amarilla, L.A. (1997). First observations and new distributional data for birds in Paraguay. *Bull. Brit. Orn. Club* **117(1)**: 60-67.
Ericson, P.G.P., Christidis, L., Cooper, A., Irestedt, M., Jackson, J., Johansson, U.S. & Norman, J.A. (2002). A Gondwanan origin of passerine birds supported by DNA sequences of the endemic New Zealand wrens. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **269**: 235-241.
Ericson, P.G.P., Christidis, L., Irestedt, M. & Norman, J. (2002). Systematic affinities of the lyrebirds (Passeriformes: *Menura*), with a novel classification of the major groups of passerine birds. *Mol. Phylogen. Evol.* **25(1)**: 53-62.
Ericson, P.G.P., Irestedt, M. & Johansson, U.S. (2003). Evolution, biogeography, and patterns of diversification in passerine birds. *J. Avian Biol.* **34(1)**: 3-15.
Erlanger, C.F. von (1907). Beiträge zur Vogelfauna Nordostafrikas. *J. Orn.* **55**: 42-49.
Erskine, A.J. (1977). *Birds in Boreal Canada: Communities, Densities, and Adaptations*. Canadian Wildlife Service Report **41**.
Erskine, A.J. (1979). Man's influence on potential nesting sites and populations of swallows in Canada. *Can. Field-Nat.* **93(4)**: 371-377.
Erskine, A.J. (1984). Swallows foraging on the ground. *Wilson Bull.* **96(1)**: 136-137.
Erskine, A.J. (1992). *Atlas of Breeding Birds of the Maritime Provinces*. Nimbus Publishing & Nova Scotia Museum, Halifax, Canada.
Erterius, D. (2002). Mongolpiplarka *Anthus godlewskii* for forsta gangen antraffad i Skane. [Blyth's Pipit *Anthus godlewskii* recorded for the first time in Skane]. *Anser* **41(4)**: 284-289. In Swedish.
Ervin, S. (1992). Nesting behavior of the Large-billed Flycatcher on Isla Santa Cruz. *Noticias de Galápagos* **51**: 17-19.
Escobar, M.A.H. & Vukasovic, M.A. (2002). Captura de un Fio-Fio (*Elaenia albiceps*) en período invernal en la zona central de Chile. *Bol. Chileno Orn.* **9**: 44-46.
Escott, C.J. & Holmes, D.A. (1980). The avifauna of Sulawesi, Indonesia: faunistic notes and additions. *Bull. Brit. Orn. Club* **100(3)**: 189-195.
Esilevskaya, M.A. (1970). [On the systematic situation of the Eastern Short-toed Lark]. *Bull. Kharkov Univ., Ser. Biol.* **39(2)**: 89-93. In Russian.
Espinosa, A. & Cracraft, J. (1994). Molecular phylogeny of the lyrebird. Page 29 in: Dittami, J., Bock, W., Taborsky, M., van den Elzen, R. & Vogel-Millesi, E. eds. (1994). *Research Notes on Avian Biology 1994: Selected Contributions from the XXI International Ornithological Congress*. Journal für Ornithologie **135**(Supplement).
Espinosa, L.A. & Egli, G. (1997). Nueva información biométrica y conductual del Fio-fio (*Elaenia albiceps chilensis*). *Bol. Chileno Orn.* **4**: 9-13.
Estades, C.F. (1999). Selección de sitios de nidificación por Diucones (*Xolmis pyrope*) en plantaciones jóvenes de pino. *Bol. Chileno Orn.* **6**: 24-27.
Estrada, J. (2003). Calandria *Melanocorypha calandra*. Pp. 366-367 in: Martí & del Moral (2003).
Étchécopar, R.D. (1975). Notes sur le comportement de l'Alouette Clot Bey (*Rhamphocorys clot-bey*). *Ardeola* **21**: 867-873.
Étchécopar, R.D. & Hüe, F. (1964). *Les Oiseaux du Nord de l'Afrique de la Mer Rouge aux Canaries*. Éditions N. Boubée, Paris.
Étchécopar, R.D. & Hüe, F. (1983a). *The Birds of North Africa*. Oliver & Boyd, Edinburgh.
Étchécopar, R.D. & Hüe, F. (1983b). *Les Oiseaux de Chine, de Mongolie et de Corée. Passereaux*. Société Nouvelle des Éditions Boubée, Paris.
Etherington, G. (2001). OrnithoNews. A new species - eventually! *Birding World* **14(11)**: 443.
Etherington, G. (2002). OrnithoNews. A new African Pipit. *Birding World* **15(11)**: 442.
Euler, C. (1900). *Descriçao de Ninhos e Ovos das Aves do Brasil*. Revista do Museu Paulista **4**. 139 pp.
Evans, D.J. (1999). The first Brown-chested Martin *Phaeoprogne tapera* in Chile. *Cotinga* **11**: 67.
Evans, D.M. & Finch, D.M. (1994). Relationships between forest songbird populations and managed forests in Idaho. Pp. 308–314 in: Covington, W.W. & DeBano, L.F. eds. (1994). *Sustainable Ecological Systems: Implementing an Ecological Approach to Land Management*. USDA Forest Service General Technical Report **RM-247**.
Evans, J., Wilson, J.D. & Browne, S.J. (1995). The effect of organic farming regimes on breeding and winter bird populations. Part 3. Habitat selection and breeding success of Skylarks *Alauda arvensis* on organic and conventional farmland. *BTO Res. Rep.* **154**: 1-34.
Evans, K.L. (2004). Barn Swallows and agriculture. *British Birds* **97**: 218-230.
Evans, K.L., Bradbury, R.B. & Wilson, J. (2002). Population trends and the role of habitat quality in limiting populations of Barn Swallows *Hirundo rustica* in Britain. Page 128 in: Anon. (2002a). (Abstract).
Evans, K.L., Tyler, C., Blackburn, T.M. & Duncan, R.P. (2003). Changes in the breeding biology of the Welcome Swallow (*Hirundo tahitica*) in New Zealand since colonisation. *Emu* **103(3)**: 215-220.
Evans, M.I. ed. (1994). *Important Bird Areas in the Middle East*. BirdLife Conservation Series **2**. BirdLife International, Cambridge.
Evans, M.I. & Balmford, A. (1992). Birds in the Ishasha sector of Queen Elizabeth National Park, Uganda. *Scopus* **16**: 34-49.
Evans, M.R. (1998). Selection on swallow tail streamers. *Nature* **394**: 233-234.
Evans, M.R. & Thomas, A.L.R. (1997). Testing the functional significance of tail streamers. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **264**: 211-217.
Evans, S.W. (1996). The Blue Swallow - South Africa's most endangered bird species. *Endangered Wildl.* **22**: 10-13.
Evans, S.W. (1999a). Globally threatened bird species profile: Rudd's Lark, *Heteromirafra ruddi*. *BirdLife South Afr. Newsl.* **2(3)**: 16.
Evans, S.W. (1999b). Globally threatened bird species profile: Botha's Lark, *Spizocorys fringillaris*. *BirdLife South Afr. Newsl.* **2(4)**: 16.
Evans, S.W. (2000a). Globally threatened bird species profile: Yellow-breasted Pipit, *Hemimacronyx chloris* - IBA Conservation Programme. *BirdLife South Afr. Newsl.* **2(1)**: 10.
Evans, S.W. (2000b). Globally threatened bird species profile: Red Lark, *Certhilauda burra*. *BirdLife South Afr. Newsl.* **3(4)**: 10.
Evans, S.W. (2001). Whither the Blue Swallow - South Africa's most endangered bird? *Endangered Wildl.* **37**: 19-21.
Evans, S.W. (2002). Globally threatened bird species profile: Blue Swallow, *Hirundo atrocaerulea*. *BirdLife South Afr. Newsl.* **5(1)**: 20-21.
Evans, S.W. & Bouwman, H. (2000). The influence of mist and rain on the reproductive success of the Blue Swallow *Hirundo atrocaerulea*. *Ostrich* **71(1&2)**: 83-86.
Evans, T.D., Dutson, G.C.L. & Brooks, T.M. (1993). *Cambridge Philippines Rainforest Project 1991. Final Report*. BirdLife Study Report **54**. BirdLife International, Cambridge.
Evans, T.D., Magsalay, P., Dutson, G.C.L. & Brooks, T.M. (1993). The conservation status of forest birds of Siquijor, Philippines. *Forktail* **8**: 89-96.
Every, B. (1973). Bird's nests in the Eastern Cape. *Eastern Cape Naturalist* **50**: 26-29.
Every, B. (1988). Unusual feeding habits of swallows. *Bokmakierie* **40(4)**: 127.
Ewert, D. (1975). Notes on nests of four avian species from the coastal cordillera of Venezuela. *Wilson Bull.* **87(1)**: 105-106.
Eydoux, J.F.T. & Gervais, F.L.P. (1838). Sur quelques particularités anatomiques du *Phytotoma rara* de Molina. *Mag. Zool.* **VII**: 1-3.
Eynon, A.E. (1936). Rough-winged Swallow breeding in Rhode Island. *Auk* **53(1)**: 83-84.
Faaborg, J.R. (1985). Ecological constraints on West Indian bird distributions. Pp. 621-662 in: Buckley *et al.* (1985).
Faaborg, J.R. & Terborgh, J.W. (1980). Patterns of migration in the West Indies. Pp. 157-163 in: Keast & Morton (1980).
Faanes, C.A. (1980). Breeding biology of Eastern Phoebes in northern Wisconsin. *Wilson Bull.* **92(1)**: 107-110.
di Fabrizio, F., Pellegrini, M. & Santone, P. (1982). Nuove nidificazioni di Pispola *Anthus pratensis* in Abruzzo. [New records of nesting Meadow Pipit *Anthus pratensis* in Central Appennini (Italy)]. *Avocetta* **6(2)**: 91-93. In Italian with English and French summary.
Fahse, L., Dean, W.R.J. & Wissel, C. (1998). Modelling the size and distribution of protected areas for nomadic birds: Alaudidae in the Nama-Karoo, South Africa. *Biol. Conserv.* **85(1-2)**: 105-112.
Fair, J.M. & Myers, O.B. (1998). Life history traits and the ecological costs of contaminants on cavity-nesting birds. Page 72 in: Anon. (1998b). (Abstract).
Fairon, J. (1975). Contribution à l'ornithologie de l'Aïr (Niger). *Gerfaut* **65**: 107-134.
Falla, R.A. (1953). Description of a new form of New Zealand wren. *Notornis* **5(5)**: 142-143.
Falla, R.A., Sibson, R.B. & Turbott, E.G. (1981). *The New Guide to the Birds of New Zealand and Outlying Islands*. Collins, Auckland & London.
Fanshawe, J.H. (1991). Saving Sokoke. *World Birdwatch* **13(3)**: 10-11.

Fanshawe, J.H. & Bennun, L.A. (1991). Bird Conservation in Kenya: Creating a national strategy. *Bird Conserv. Int.* **1**: 293-315.
Farina, A. (1978). Breeding biology of the Crag Martin. *Avocetta* **2**: 35-46.
Farmer, R. (1979). Checklist of birds of the Ile-Ife Area, Nigeria. *Malimbus* **1(1)**: 56-64.
Farrand, J. (1983). *The Audubon Society Master Guide to Birding*. Vol. 2. Gulls to Dippers. Alfred A. Knopf, New York.
Fasola, M., Benussi, E. & Bino, T. (1997). Abandoned buildings increase nest density of Red-rumped Swallows *Hirundo daurica* in Karavasta Area, Albania. [Les ruines militaires augmentent la densité de Hirondelles rousselines nidificatrices dans la région de Karavasta (Albanie)]. *Alauda* **65(3)**: 279-280. In English with French summary.
Faxon, D. & Bayer, R.D. (1991). *Birds of the Coast Range of Lincoln County, Oregon*. Vol. 1. Birds of Thornton Creek. Studies in Oregon Ornithology **8**. Gahmken Press, Newport, Oregon.
Feare, C.J. (1977). *Phedina borbonica madagascariensis* in the Amirantes. *Bull. Brit. Orn. Club* **97(3)**: 87-89.
Feduccia, A. (1975). Morphology of the bony stapes in the Menuridae and Acanthisittidae: evidence for oscine affinities. *Wilson Bull.* **87(3)**: 418-420.
Feduccia, A. & Olson, S.L. (1982). Morphological similarities between the Menurae and the Rhinocryptidae, relict passerine birds of the southern hemisphere. *Smithsonian Contrib. Zool.* **366**: 1-22.
Feduccia, J.A. (1967). A new swallow from the Fox Canyon Local Fauna (Upper Pliocene) of Kansas. *Condor* **69(5)**: 526-527.
Feldman, H. & Feldman, A. (1978). Anselhahn füttert Bachstelzenbrut. *Vögel der Heimat* **48**: 130.
Feldmann, P., Villard, P. & Barre, N. (1998). Les populations d'oiseaux forestiers de la Basse-Terre en Guadeloupe. Comunidades de aves de Basse-Terre, Guadalupe, Antillas Francesas. [Forest birds community in Basse-Terre, Guadeloupe, F.W.I.]. *Progr. Abstr. Soc. Caribb. Orn. Ann. Meet.* **11**: C9. (Abstract).
Fellenberg, W. (1985). On the breeding biology of the Grey Wagtail *Motacilla cinerea* with special reference to nest sanitation. *Charadrius* **21**: 9-22.
Ferguson-Lees, I.J. (1962). Studies of less familiar birds. 116. Crested Lark. *British Birds* **55**: 37-42.
Ferguson-Lees, I.J. (1969). Studies of less familiar birds. 153. Red-throated Pipit. *British Birds* **62**: 110-115.
Fernández, E.M. & Keith, A.R. (2003). Three unusual bird nests from the Dominican Republic. *J. Carib. Orn.* **16(1)**: 73-74.
Fernández, F.J. (2003). Algunos descubrimientos zoológicos recientes (III). *Argutorio* **10**: 46-49.
Ferreira, A.A. & Cavalcanti, R.B. (1997). Uso diferencial de nicho espacial entre machos e femeas de *Antilophia galeata*. [Differential use of niche space between male and female Helmeted Manakins, *Antilophia galeata*]. Page 152 in: Marini (1997). (Abstract).
Ferreira, A.A. & Cavalcanti, R.B. (2000). Efeitos da fragmentação de matas de galeria sobre *Antilophia galeata* (Pipridae). Pp. 378-379 in: Straube *et al.* (2000). (Abstract).
Ferreira de Vasconcelos, M. (1999). Natural history notes and conservation of two species endemic to the Espinhaço Range, Brazil: Hyacinth Visorbearer *Augastes scutatus* and Grey-backed Tachuri *Polystictus superciliaris*. *Cotinga* **11**: 75-78.
Ferreira de Vasconcelos, M. (2001). Adições à avifauna da Serra do Caraça, Minas Gerais. *Atualidades Orn.* **104**: 3-4.
Ferreira de Vasconcelos, M. (2003). A avifauna dos campos de altitude da Serra do Caparaó, estados de Minas Gerais e Espírito Santo, Brasil. *Cotinga* **19**: 40-48.
Ferreira de Vasconcelos, M. (2004). Bem-te-vi guloso tenta comer um lagarto. [A greedy bemtevi attempts to eat a lizard]. *Atualidades Orn.* **117**: 4.
Ferreira de Vasconcelos, M. & Lamas, I.R. (2000). Incêndios florestais como una possível ameaça ao pavó (*Pyroderus scutatus*). *Atualidades Orn.* **93**: 2.
Ferreira de Vasconcelos, M. & Lombardi, J.A. (1996). Primeira descrição do ninho e do ovo de *Polystictus superciliaris* (Passeriformes: Tyrannidae) ocorrente na Serra do Curral, Minas Gerais. [First description of the nest and the egg of *Polystictus superciliaris* (Passeriformes: Tyrannidae) occurrent at Serra do Curral, Minas Gerais]. *Ararajuba* **4(2)**: 114-116. In Portuguese with English summary.
Ferreira de Vasconcelos, M. & Melo-Júnior, T.A. (2001). An ornithological survey of Serra do Caraça, Minas Gerais, Brazil. *Cotinga* **15**: 21-31. In English with Portuguese summary.
Ferreira de Vasconcelos, M., Lima, P.C., dos Santos, S.S. & da Rocha Lima, R.C.F (2003). Ocorrência migratória de *Progne tapera fusca* (Passeriformes: Hirundinidae) na região da Serra do Caraça, Minas Gerais, Brasil. *Ararajuba* **11(2)**: 221-222.
Ferreira de Vasconcelos, M., Maldonado-Coelho, M. & Buzzetti, D.R.C. (2003). Range extensions for the Gray-backed Tachuri (*Polystictus superciliaris*) and the Pale-throated Serra-finch (*Embernagra longicauda*) with a revision on their geographic distribution. *Orn. Neotropical* **14(4)**: 477-489. In English with Portuguese summary.
Ferreira de Vasconcelos, M., Maldonado-Coelho, M. & Durães, R. (1999). Notas sobre algumas espécies de aves ameaçadas e pouco conhecidas da porcão meridional da Cadeia do Espinhaço, Minas Gerais. *Melopsittacus* **2(2/4)**: 44-50.
Ferrier, S. (1983). Song variation in the Rufous Scrub-bird. *Bird Behaviour* **4(2)**: 109. (Abstract).
Ferrier, S. (1984). *The Status of the Rufous Scrub-bird* Atrichornis rufescens*: Habitat, Geographical Variation and Abundance*. PhD thesis, University of New England, Armidale, Australia.
Ferrier, S. (1985). Habitat requirements of a rare species, the Rufous Scrub-bird. Pp. 241-248 in: Keast, A., Recher, H.F., Ford, H. & Saunders, D. (1985). *Birds of Eucalypt Forests and Woodlands: Ecology, Conservation, Management*. Surrey Beatty, Sydney.
Ferro, A.L. & Donatelli, R.J. (2000). Dinâmica da avifauna na Fazenda Igurê, Garça, São Paulo. Pp. 276-277 in: Straube *et al.* (2000). (Abstract).
du Feu, C. (1993). *Nestboxes*. British Trust for Ornithology, Thetford.
ffrench, R.P. (1986). *Birds of Trinidad and Tobago*. Macmillan, London & Basingstoke.
ffrench, R.P. (1991). *A Guide to the Birds of Trinidad and Tobago*. 2nd edition. Cornell University Press, Ithaca, New York.
ffrench, R.P. & Kenefick, M. (2003). Verification of rare bird records from Trinidad and Tobago. *Cotinga* **19**: 75-78.
Field, G.D. (1968). Utilization of mangroves by birds on the Freetown Peninsula, Sierra Leone. *Ibis* **110(3)**: 354-357.
Field, G.D. (1974). *Birds of the Freetown Peninsula*. Fourah Bay College Bookshop Ltd, Freetown.
Field, M. (1971). Tree Swallows acting as foster parents to Bluebirds. *Ontario Bird Banding* **7**: 44-46.
Filardi, C.E., Smith, C.E., Kratter, A.W., Steadman, D.W. & Webb, H.P. (1999). New behavioral, ecological, and biogeographic data on the avifauna of Rennell, Solomon Islands. *Pacific Sci.* **53(4)**: 319-340.
Filip, K. (1996). Prvni prokazany vyskyt kalandry cerne (*Melanocorypha yeltoniensis*) na uzemi Ceske republiky. [The first occurrence of Black Lark (*Melanocorypha yeltoniensis*) in the Czech Republic]. *Sylvia* **32(1)**: 61-62.
Filipek, G. (1995). [Nest observation of White-winged Lark (*Melanocorypha leucoptera*) in Poland]. *Bad. Orn. Ziemi Przemyskiej* **3**: 89-90. In Polish.
Finch, B.W. (1980). Welcome Swallow *Hirundo neoxena* at Aroa Lagoon, Central Province: a new species for the New Guinea region. *Papua New Guinea Bird Soc. Newsl.* **173-174**: 4-5.
Finch, B.W. (1982). Fairy Martin *Hirundo ariel* at Kanosia Lagoon, first record for Central Province. *Papua New Guinea Bird Soc. Newsl.* **193-194**: 12.
Finch, B.W. (1983). Party of seven Striated Swallows *Hirundo (daurica) striolata* at Moitaka / Waigani Swamp. *Papua New Guinea Bird Soc. Newsl.* **201-202**: 14.
Finch, B.W. (1984). Welcome Swallows *Hirundo neoxena* at Hisiu Lagoon - second record for the New Guinea region. *Papua New Guinea Bird Soc. Newsl.* **212**: 4-5.
Finch, B.W. (1989). Blue Swallows *Hirundo atrocaerulea* near Busia: the second record for Kenya. *Scopus* **13**: 125-126.
Finch, B.W. (2002). Nairobi Pipit. *Swara* **25(3)**: 18-20.
Finch, D.M. (1990). Effects of predation and competitor interference on nesting success of House Wrens and Tree Swallows. *Condor* **92(3)**: 674-687.
Finch, D.M. (1991). *Population Ecology, Habitat Requirements, and Conservation of Neotropical Migratory Birds*. General Technical Report **RM-205**. Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.
Finch, D.M. (1992). *Threatened, Endangered, and Vulnerable Species of Terrestrial Vertebrates in the Rocky Mountain Region*. USDA Forest Service General Technical Report **RM-215**.
Finch, D.W. (1991). Novedades ornitológicas argentinas. *Nuestras Aves* **9(24)**: 24-25.
Findlay, H.A., Ledgard, T.G., Ledgard, N.J. & Graham, D. (1960). Successful breeding of Welcome Swallows in Northland. *Notornis* **8(8)**: 262-263.
Finlay, J.C. (1971a). Post-breeding nest cavity defense in Purple Martins. *Condor* **73(3)**: 381-382.
Finlay, J.C. (1971b). Breeding biology of Purple Martins at the northern limit of their range. *Wilson Bull.* **83(3)**: 255-269.
Finlay, J.C. (1975). Nesting of Purple Martins in natural cavities and in man-made structures in Alberta. *Can. Field-Nat.* **89(4)**: 454-455.
Finlay, J.C. (1976). Some effects of weather on Purple Martin activity. *Auk* **93(2)**: 231-244.
Finlayson, J.C. (1978). Roosting behaviour of the Crag Martin in its winter quarters at Gibraltar. *Alectoris* **1**: 23-29.
Fiorini, V.D. & Rabuffetti, F.L. (2003). Cuidado parental en el Churrinche (*Pyrocephalus rubinus*): contribución relativa del macho y de la hembra. [Parental care in the Vermilion Flycatcher (*Pyrocephalus rubinus*): relative contribution of male and female]. *Hornero* **18(1)**: 31-35. In Spanish with English summary.
Fischer, H.W. (1991). [Observations at nests of Tawny Pipits *Anthus campestris* on the Doornspijkse Heide in 1942 and 1943]. *Limosa* **64(4)**: 165-167. In Dutch with English summary.
Fishpool, L.D.C. & Evans, M.I. (2001). *Important Bird Areas in Africa and Associated Islands: Priority Sites for Conservation*. BirdLife Conservation Series **11**. Pisces Publications & BirdLife International, Newbury & Cambridge.
Fishpool, L.D.C., Oueda, G. & Compaore, P. (2000). Kordofan Bush Lark *Mirafra cordofanica* and Desert Lark *Ammomanes deserti*, additions to the avifauna of Burkina Faso. *Malimbus* **22(2)**: 49-54.
Fitch, F.W. (1950). Life history and ecology of the Scissor-tailed Flycatcher, *Muscivora forficata*. *Auk* **67(2)**: 145-168.
Fitzgerald, B.M. (1985). Wren. 3. Pp. 665-666 in: Campbell & Lack (1985).
Fitzpatrick, J.W. (1973). Speciation in the genus *Ochthoeca* (Aves: Tyrannidae). *Breviora* **403**: 1-13.
Fitzpatrick, J.W. (1976). Systematics and biogeography of the tyrannid genus *Todirostrum* and related genera (Aves). *Bull. Mus. Comp. Zool.* **147**: 435-463.
Fitzpatrick, J.W. (1978). *Foraging Behavior and Adaptive Radiation in the Avian Family Tyrannidae*. PhD dissertation, Princeton University, Princeton, New Jersey.
Fitzpatrick, J.W. (1980a). Wintering of North American tyrant flycatchers in the Neotropics. Pp. 67-78 in: Keast & Morton (1980).
Fitzpatrick, J.W. (1980b). Some aspects of speciation in South American flycatchers. Pp. 1273-1279 in: Nohring, R. ed. (1980). *Acta XVII Congressus Internationalis Ornithologici, Berlin 1978*. Verlag D.O.G., Berlin.
Fitzpatrick, J.W. (1980c). Foraging behavior of Neotropical tyrant flycatchers. *Condor* **82(1)**: 43-57.
Fitzpatrick, J.W. (1981). Search strategies of tyrant flycatchers. *Anim. Behav.* **29**: 810-821.
Fitzpatrick, J.W. (1982). Genus *Conioptilon*: *Conioptilon mclihennyi* - Black-faced Cotinga. Pp. 125-127 in: Snow (1982).
Fitzpatrick, J.W. (1983). *Tyrannus melancholicus*. Pp. 611-613 in: Janzen (1983).
Fitzpatrick, J.W. (1985a). Flycatcher (2). Pp. 231-233 in: Campbell & Lack (1985).
Fitzpatrick, J.W. (1985b). Form, foraging behavior, and adaptive radiation in the Tyrannidae. Pp. 447-470 in: Buckley *et al.* (1985).
Fitzpatrick, J.W. (1985c). The role of scientific collections in ecological morphology. Pp. 195-208 in: Miller, E.H. ed. *Museum Collections: their Roles and Future in Biological Research*. British Columbia Provincial Museum Occasional Papers **25**.
Fitzpatrick, J.W. & O'Neill, J.P. (1979). A new Tody-tyrant from northern Peru. *Auk* **96(3)**: 443-447.
Fitzpatrick, J.W. & Stotz, D.F. (1997). A new species of tyrannulet (*Phylloscartes*) from the Andean foothills of Peru and Bolivia. Pp. 37-44 in: Remsen (1997).
Fitzpatrick, S. (1996). Haudonnan jakaminen sukupuolten kesken västäräkillä. [Male and female incubation in Pied Wagtails *Motacilla alba*: shared costs or increased parental care?] *Ornis Fenn.* **73(2)**: 88-96.
Fjeldså, J. (1983). Vertebrates of the Junín Area, central Perú. *Steenstrupia* **8**: 285-298.
Fjeldså, J. (1987). *Birds of Relict Forests in the High Andes of Peru and Bolivia*. Zoological Museum of the University of Copenhagen, Copenhagen, Denmark.
Fjeldså, J. (1988). Status of birds of steppe habitats of the Andean zone and Patagonia. Pp. 81-95 in: Goriup (1988b).
Fjeldså, J. (1990). Geographic variation in the Rufous-webbed Tyrant *Polioxolmis rufipennis*, with description of a new subspecies. *Bull. Brit. Orn. Club* **110(1)**: 26-31.
Fjeldså, J. & Kessler, M. (1996). *Conserving the Biological Diversity of* Polylepis *Woodlands of the Highland of Peru and Bolivia*. NORDECO, Copenhagen.
Fjeldså, J. & Krabbe, N.K. (1986). Some range extensions and other unusual records of Andean birds. *Bull. Brit. Orn. Club* **106(3)**: 115-126.
Fjeldså, J. & Krabbe, N.K. (1990). *Birds of the High Andes*. Apollo Books & Zoological Museum, Svendborg & Copenhagen.
Fjeldså, J. & Maijer, S. (1996). *Recent Ornithological Surveys in the Valles Region, Southern Bolivia, and the Possible Role of Valles for the Evolution of the Andean Avifauna*. Technical Report **1**. DIVA, Rønde, Denmark.
Fjeldså, J., Zuccon, D., Irestedt, M., Johansson, U.S. & Ericson, P.G.P. (2003). *Sapayoa aenigma*: a New World representative of "Old World suboscines". *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **270**(Suppl.): 238-241.
Flanagan, J.N.M. & Malo, J.A. (2000). Los últimos cortarramas peruanos. *Garcilla* **109**: 10-11.
Flanagan, J.N.M. & More, M. (2003). *Ecología y Conservación de la Cortarrama Peruana (*Phytotoma raimondii*) en el Bosque Seco Ralo del Noroeste de Perú*. Memorias del I Congreso Internacional de Bosques Secos (6-9 Noviembre, 2003). Universidad de Piura, Perú.
Flanagan, J.N.M. & Vellinga, W.P. (2000). *Tres Bosques de Neblina de Ayabacu: su Avifauna y Conservación*. ProAves, Piura, Peru.
Flannery, T. & Schouten, P. (2001). A lost menagerie. *Natural History* **110(9)**: 66-71.
Fleay, D. (1952). Transporting lyrebirds to Tasmania. *Victorian Naturalist* **69**: 60-63.
Fleming, C.A. (1975). The geological history of New Zealand and its biota. Pp. 1-86 in: Kuschel, G. ed. (1975). *Biogeography and Ecology in New Zealand*. Junk, The Hague.
Fleming, C.A. (1982). *George Edward Lodge. The Unpublished New Zealand Bird Paintings*. Nova Pacifica, Wellington.
Fleming, P. (2003). From the chairman's hide: action plans for the conservation of globally threatened species in Africa. *Zambian Orn. Soc. Newsl.* **33(7)**: 2-3.
Fleming, R.L. & Baker, R.H. (1963). Notes on the birds of Durango, Mexico. *Publ. Mus. Michigan State. Univ. Biol. Series* **2**: 275-303.
Fletcher, M.R. (1987). Markings on the eggs of House Martins *Delichon urbica* are not uncommon. *Bird Study* **34**: 253.
Flint, P. & Stewart, P. (1992). *The Birds of Cyprus. An Annotated Check-list*. BOU Check-list **6**. 2nd edition. British Ornithologists' Union, Tring, UK.
Flint, V.E., Boehme, R.L., Kostin, Y.V. & Kuznetsov, A.A. (1984). *A Field Guide to Birds of the USSR*. Princeton University Press, Princeton, New Jersey.
Flores, E. & Capriles, C. (1998). Las aves del Parque Nacional Toro Toro, Dpto. Potosí: una lista preliminar comentada Pp. 23-31 in: Sagot & Guerrero (1998).
Flousek, J. (1986). Taxonomic study on the Grey Wagtail *Motacilla cinerea* (Aves: Passeriformes). *Vestn. Cesk. Spol. Zool.* **50**: 87-111.
Flousek, J. (1987). Breeding biology of the Grey Wagtail *Motacilla cinerea* (Passeriformes, Aves). *Acta Univ. Carol. Biol.* **1985(5-6)**: 253-300.
Flumm, D.S. (1977). Bimaculated Lark in the Isles of Scilly. *British Birds* **70**: 298-300.
Flury, B.D., Airoldi, J.P. & Biber, J.P. (1992). Gender identification of Water Pipits (*Anthus spinoletta*) using mixtures of distributions. *J. Theor. Biol.* **158(4)**: 465-480.
Flux, J.E.C. & Wilson, P.R. (1965). Note on Welcome Swallows in Northland. *Notornis* **12(1)**: 51-52.
Fogden, M.P.L. (1993). *An Annotated Checklist of the Birds of Monteverde and Peñas Blancas*. Published privately, Monteverde, Costa Rica.
Fogden, M.P.L. & Fogden, P.M. (1997). Notes on the behaviour of Bare-necked Umbrellabird *Cephalopterus glabricollis* in the Monte Verde Cloud Forest Preserve, Costa Rica. *Cotinga* **8**: 23-26.
Foggo, M.N. (1984). Some observations on the southern subspecies of the New Zealand Pipit. *Notornis* **31(1)**: 1-5.
Foggo, M.N., Hitchmough, R.A. & Daugherty, C.H. (1997). Systematic and conservation implications of geographic variation in pipits (*Anthus*: Motacillidae) in New Zealand and some offshore islands. *Ibis* **139(2)**: 366-373.
Folmer, O. & Ortvad, T. (1992). Observations of terrestrial birds on Selvagem Grande, in September 1990. *Bocagiana* **160**: 1-6.
Fontana, C.S. (1997). Description of the nests and eggs of the Black-and-white Monjita *Heteroxolmis dominicana*. *Cotinga* **8**: 79-81.
Fontana, C.S. & Voss, W.A. (1995). Padrões comportamentais comuns de *Heteroxolmis dominicana* (Vieillot, 1823) (Tyrannidae), na savana do nordeste do Rio Grande do Sul, Brasil. *Biociências* **3(2)**: 129-143.
Fontana, C.S., Joenck, C.M. & Mähler, J.K.F. (2000). Description of the nest and eggs of the Shear-tailed Gray-tyrant (*Muscipipra vetula*) and considerations on its historical ecology implications. *Orn. Neotropical* **11**: 169-172.
Fontana, C.S., Maisonnave, F.L., Lima, A. & Joenck, C.M. (2000). Levantamento da avifauna no Morro do Osso, Porto Alegre, Rio Grande do Sul. Pp. 267-268 in: Straube *et al.* (2000). (Abstract).
Forbes, W.A. (1882). Contributions to the anatomy of passerine birds. Part 6. On *Xenicus* and *Acanthisitta* as types of a new family (Xenicidae) of mesomyodean passeres from New Zealand. *Proc. Zool. Soc. London* **1882**: 569-571.
Forbush, E.H. (1927). *Birds of Massachusetts and other New England States*. Vol. 2. Massachusetts Department of Agriculture, Norwood Press, Norwood, Massachusetts.
Forrester, B.C. (1993). *Birding Brazil. A Check-list and Site Guide*. Published privately, Rankinston, UK.
Forrester, D.J., Greiner, E.C. & McFarlane, R.W. (1977). Blood parasites of some columbiform and passeriform birds from Chile. *J. Wildl. Diseases* **13**: 94-96.

Foster, M.S. (1976). Nesting biology of the Long-tailed Manakin. *Wilson Bull.* **88(3)**: 400-420.
Foster, M.S. (1977a). Odd couples in manakins: a study of social organization and cooperative breeding in *Chiroxiphia caudata*. *Amer. Naturalist* **111(981)**: 845-853.
Foster, M.S. (1977b). Social organization and behavior of the Swallow-tailed Manakin, *Chiroxiphia caudata*. *Natl. Geogr. Soc. Mag.*: 313-320.
Foster, M.S. (1977c). Ecological and nutritional effects of food scarcity on a tropical frugivorous bird and its fruit source. *Ecology* **58(1)**: 73-85.
Foster, M.S. (1981). Cooperative behavior and social organization of the Swallow-tailed Manakin (*Chiroxiphia caudata*). *Behav. Ecol. Sociobiol.* **9(3)**: 167-177.
Foster, M.S. (1984). Jewel bird Jamboree. *Natural History* **93(7)**: 54-59.
Foster, M.S. (1985). Pre-nesting cooperation in birds: another form of helping behavior. Pp. 817-828 in: Buckley *et al.* (1985).
Foster, M.S. (1987). Delayed maturation, neoteny, and social system differences in two manakins of the genus *Chiroxiphia*. *Evolution* **41(3)**: 547-558.
Foster, M.S. (1991). Los Saltarines y sus extraordinarios sistemas sociales de leks. *Bol. Soc. Antioqueña Orn.* **2(4)**: 5-14.
Foster, M.S. (1996). Evolution of lek social systems in manakins: alternative models and proofs. Pp. 39-42 in: Anon. (1996e).
Foster, M.S. (1997). Habitat saturation and lek evolution in Dwarf-tyrant Manakins (*Tyranneutes stolzmanni*). *Adv. Ethol.* **32**: 41.
Foster, M.S. (1998). Ecology and behaviour of the Alder Flycatcher *Empidonax alnorum* Tyrannidae in winter. *Ostrich* **69(3&4)**: 284. (Abstract).
Foster, M.S. & Johnson, N.K. (1974). Notes on birds of Costa Rica. *Wilson Bull.* **86(1)**: 58-63.
Foster, R.B., Carr, J.L. & Forsyth, A.B. eds. (1994). *The Tambopata-Candamo Reserved Zone of Southeastern Perú: a Biological Assessment*. Rapid Assessment Program Working Papers **6**. Conservation International, Washington. D.C.
Fotteler, E.R., Mitropolsky, O.V. & Tretyakov, G.P. (1984). [Materials on the nesting of wagtails (*Motacilla* sp.) in western Tien Shan]. *Ornitologiya* **19**: 113-119. In Russian with English summary.
Fouarge, J.P. (1992). Résultats du recensement des nids d'Hirondelle de fenêtre (*Delichon urbica*) à Bruxelles en 1992. *Aves* **29**: 191-195.
Fowler, J.A., Blakesley, D. & Miller, C.J. (1984). Red-throated Pipit chasing swifts. *British Birds* **77**: 361-362.
Fraga, R. (1979). Helpers at the nest in passerines from Buenos Aires Province, Argentina. *Auk* **96(3)**: 606-608.
Fraga, R. (2003). Distribution, natural history and conservation of the Black-and-white Monjita (*Heteroxolmis dominicana*) in Argentina, a species vulnerable to extinction. *Orn. Neotropical* **14(2)**: 145-156.
Fraga, R. & Clark, R. (1999). Notes on the avifauna of the upper Bermejo River (Argentina and Bolivia) with a new species for Argentina. *Cotinga* **12**: 77-78.
Fraga, R. & Narosky, S. (1985). *Nidificación de las Aves Argentinas. (Formicariidae a Cinclidae)*. Asociación Ornitológica del Plata. Buenos Aires.
Frakes, R.A. & Johnson, R.E. (1982). Niche convergence in *Empidonax* flycatchers. *Condor* **84(3)**: 286–291.
Francis, J. & Shirihai, H. (1999). *Ethiopia: in Search of Endemic Birds*. Published privately, London.
Francisco, M.R. & Galetti, M. (2002). Aves como potenciais dispersoras de sementes de *Ocotea pulchella* Mart. (Lauraceae) numa area de vegetação de cerrado do sudeste brasileiro. *Rev. Bras. Bot.* **25**: 11-17.
Franzreb, K.E. (1976). Nest site competition between Mountain Chickadees and Violet-green Swallows. *Auk* **93(4)**: 836-837.
Fraser, L. (1843). On the collection of birds brought to England by Mr. Bridges. *Proc. Zool. Soc. London* **1843**: 108-121.
Fraser, M. (2003). Advance of the wagtails. *Birdwatch* **129**: 10-11.
Fraser, M. (2004). Avian revelations: the battle to preserve island wildlife. *Birdwatch* **143**: 10-12.
Fraticelli, F. & Petretti, F. (1991). Nidificazione della Rondine rossiccia *Hirundo daurica* nel Lazio. *Riv. Ital. Orn.* **61(3-4)**: 134.
Fraticelli, F. & Sorace, A. (1988). Osservazione di una Pispoletta, *Calandrella rufescens*, nel Lazio. *Riv. Ital. Orn.* **58(3-4)**: 216.
Freeman, W.G. (1922). *Notes on the Food and Habits of some Trinidad Birds*. Bulletin of the Department of Agriculture of Trinidad & Tobago **20**. 190 pp.
Freemark, K.E. & Collins, B. (1992). Lanscape ecology of birds breeding in temperate forest fragments. Pp. 443-454 in: Hagan & Johnston (1992).
Freemark, K.E., Dunning, J.B., Hejl, S.J. & Probst, J.R. (1995). A landscape ecology perspective for research, conservation, and management. Pp. 381-427 in: Martin & Finch (1995).
Freer, V.M. (1977). *Colony Structure and Function in the Bank Swallow* Riparia riparia *L.* PhD thesis, State University of New York, Albany, New York.
Freer, V.M. (1979). Factors affecting site tenacity in New York Bank Swallows. *Bird-Banding* **50**: 349-357.
Freer, V.M. & Belanger, B. (1981). A technique for distinguishing the age classes of adult Bank Swallows. *J. Field Orn.* **52**: 341-343.
Freile, J.F. & Chaves, J.A. (2004). Interesting distributional records and notes on the biology of bird species from a cloud forest reserve in north-west Ecuador. *Bull. Brit. Orn. Club* **124(1)**: 6-16.
Frelin, C. (1983). Étude d'une population alpine de Pipits spioncelles (*Anthus spinoletta spinoletta*) en saison post-reproductive. Mue, grégarisme et préparation a la migration. [Study of an alpine population of Water Pipits *Anthus spinoletta spinoletta* in the post-reproductive season. Moult, flocking and preparation for migration]. *Alauda* **51(1)**: 11-26. In French with English summary.
Frémont, J.Y. (2002). Les oiseaux rares en France en 2000. Rapport du Comité d'Homologation National. *Ornithos* **9(1)**: 2-33.
Frémont, J.Y. (2004). Les oiseaux rares en France en 2002. Rapport du Comité d'Homologation National. *Ornithos* **11(2)**: 49-84.
Frias, O. & Kahlert, J. (1999). First records of wing-moult in southern Europe of Red-rumped Swallows *Hirundo daurica rufula*. *Ringing & Migration* **19(4)**: 313-314.
Friedmann, H. (1925). Notes on the birds observed in the lower Rio Grande Valley of Texas during May, 1924. *Condor* **57(2)**: 65-80.
Friedmann, H. (1927). *Notes on some Argentina Birds*. Bulletin of the Museum of Comparative Zoology **68(4)**, Cambridge, Massachusetts. 98 pp.
Friedmann, H. (1937). *Birds Collected by the Childs Frick Expedition to Ethiopia and Kenya Colony*. Part 2. Passeres. US National Museum Bulletin **153**. Smithsonian Institution, Washington. D.C. 506 pp.
Friedmann, H. (1946). Ecological counterparts in birds. *Scientific Monthly* **63**: 395-398.
Friedmann, H. (1948). *Birds Collected by the National Geographic Society's Expeditions to Northern Brazil and Southern Venezuela*. Proceedings of the US National Museum **97**. Smithsonian Institution, Washington, D.C. 197 pp.
Friedmann, H. & Kiff, L.F. (1985). The parasitic cowbirds and their hosts. *Proc. West. Found. Vert. Zool.* **2**: 225-304.
Friedmann, H. & Smith, F.D. (1950). *A Contribution to the Ornithology of Northeastern Venezuela*. Proceedings of the US National Museum **100**. Smithsonian Institution, Washington. D.C. 128 pp.
Friedmann, H. & Smith, F.D. (1955). *A Further Contribution to the Ornithology of Northeastern Venezuela*. Proceedings of the US National Museum **104**. Smithsonian Institution, Washington. D.C. 60 pp.
Friedmann, H. & Williams, J.G. (1969). The birds of the Sango Bay forests, Buddu County, Manaka District, Uganda. *Contrib. Sci. Los Angeles Co. Nat. Hist. Mus.* **162**: 1-48.
Friedmann, H., Griscom, L. & Moore, R.T. (1950). *Distributional Check-list of the Birds of Mexico*. Part I. Cooper Ornithological Society, Berkeley, California.
Friedmann, H., Griscom, L. & Moore, R.T. (1957). *Distributional Check-list of the Birds of Mexico*. Part II. Cooper Ornithological Society, Berkeley, California.
Friedmann, H., Kiff, L.F. & Rothstein, S.I. (1977). *A Further Contribution to Knowledge of the Host Relations of the Parasitic Cowbirds*. Smithsonian Contributions Zoology **235**. 75 pp.
Fritcher, S. (1997). Singing Baird's Sparrow and Sprague's Pipit at Ft. Pierre National Grassland, South Dakota. *South Dakota Bird Notes* **49(4)**: 98.
Frith, H.J. ed. (1969). *Birds in the Australian High Country*. A.H. & A.W. Reed, Sydney.
Frith, H.J. ed. (1976). *The Reader's Digest Complete Book of Australian Birds*. Reader's Digest, Sydney.
Froese, K.L., Verbrugge, D.A., Ankley, G.T., Niemi, G.J., Larsen, C.P. & Giesy, J.P. (1998). Bioaccumulation of polychlorinated biphenyls from sediments to aquatic insects and Tree Swallow eggs and nestlings in Saginaw Bay, Michigan, USA. *Environm. Toxicol. Chem.* **17**: 484-492.
Frost, M.D. & Massiah, E.B. (2001). Caribbean Martins (*Progne dominicensis*) overwinter at a roost in Bridgetown, Barbados. *Pitirre* **14(3)**: 128-129.
Frost, P.G.H. & Siegfried, W.R. (1975). Use of legs as dissipators of heat in flying passerines. *Zool. Afr.* **10(1)**: 101-102.
Fry, C.H. (1973). The juvenile plumage of *Pseudhirundo griseopyga* and identity of "Vom Swallows". *Bull. Brit. Orn. Club* **93(4)**: 138-139.
Fry, C.H. (1980). An analysis of the avifauna of African northern tropical woodlands. Pp. 77-88 in: Johnson, D.N. (1980).
Fry, C.H. (1992). Myrmecophagy by *Pseudochelidon eurystomina* and other African birds. Pp. 87-96 in: Monk (1992).
Fry, C.H. & Smith, D.A. (1985). A new swallow from the Red Sea. *Ibis* **127(1)**: 1-6.
Fry, C.H., Ferguson-Lees, I.J. & Dowsett, R.J. (1972). Flight muscle hypertrophy and ecophysiological variation of Yellow Wagtail *Motacilla flava* races at Lake Chad. *J. Zool. Soc. London* **167**: 293-306.
Fuggles-Couchman, N.R. (1939). Notes on some birds of the eastern Province of Tanganyika Territory. *Ibis* **Ser. 14, no 3.**: 76-106.
Fuggles-Couchman, N.R. (1984a). The distribution of, and other notes on, some birds of Tanzania. *Scopus* **8(1)**: 1-17.
Fuggles-Couchman, N.R. (1984b). The distribution of, and other notes on, some birds of Tanzania. Part II (continued). *Scopus* **8(4)**: 81-92.
Fuggles-Couchman, N.R. (1986). Breeding records of some Tanzanian birds. *Scopus* **10(1)**: 20-26.
Fujita, G. (1993). Nest site selection and reproductive success in Barn Swallows (*Hirundo rustica*): preliminary report. *Strix* **12**: 35-39.
Fujita, G. & Higuchi, H. (1992). The relationship between habitat changes and population dynamics in Barn Swallows *Hirundo rustica*. *Strix* **11**: 169-177.
Fuller, E. (2000). *Extinct Birds*. Oxford University Press, Oxford.
Furlong, D. (1999). Roosting Cape Wagtails. *Bokmakierie* **184**: 12.
Gabaldón, M. (1992). *Parques Nacionales de Venezuela*. Part 1. Parques Nacionales y Conservación Ambiental, Caracas.
Gabrielson, I.N. & Lincoln, F.C. (1959). *Birds of Alaska*. The Stackpole Company & Wildlife Management Institute, Harrisburg, Pennsylvania & Washington, D.C.
Gaines, D. (1992). *Birds of Yosemite and the East Slope*. Artemesia Press, Lee Vining, California.
Galbreath, R. (1989). *Walter Buller. The Reluctant Conservationist*. Government Printing Office, Wellington.
Galeotti, P., Saino, N., Sacchi, R. & Møller, A.P. (1997). Song correlates with social context, testosterone and body condition in male Barn Swallows. *Anim. Behav.* **53**: 687-700.
Galetti, M. & Aleixo, A. (1998). Effects of palm heart harvesting on avian frugivores in the Atlantic rain forest of Brazil. *J. Appl. Ecol.* **35(2)**: 286-293.
Galetti, M. & Pizo, M.A. (1996). Fruit eating by birds in a forest fragment in southeastern Brazil. *Ararajuba* **4(2)**: 71-79.
Gallagher, M.D. (1986). Additional notes on the birds of Oman, eastern Arabia, 1980-86. *Sandgrouse* **8**: 93-101.
Gallagher, M.D. & Woodcock, M.W. (1980). *The Birds of Oman*. Quartet Books, London.
Galushin, V., Davygora, A.V. & Moseikin, V.N. (1994). Black Lark *Melanocorypha yeltoniensis*. Pp. 352-353 in: Tucker & Heath (1994).
Gamble, L.R. & Bergin, T.M. (1996). Western Kingbird (*Tyrannus verticalis*). No. **227** in: Poole, A.F. & Gill, F.B. eds. (1996). *The Birds of North America*. Vol. 6. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Gancz, A. (1996). Observations on Long-billed Pipit *Anthus similis* in Jerusalem. *Sandgrouse* **18(1)**: 10-13.
Gander, F.F. (1934). Apparent promiscuity in the Violet-green Swallow. *Condor* **36(4)**: 176.
Gao Zhongxin (1978). [Breeding ecology of the Skylark *Alauda arvensis*]. *Chinese J. Zool.* **23(2)**: 27-28. In Chinese.
Garb, J., Kotler, B.P. & Brown, J.S. (2000). Foraging and community consequences of seed size for coexisting Negev Desert granivores. *Oikos* **88**: 291-300.
García, D. (1994). Estudi de la població d'Alosa Becuda a Catalunya. Pp. 35-36 in: Anon. (1994). *La Timoneda d'Alfes*. DEPANA, Barcelona.
García, E. (1999). An endemic in danger. *Birdwatch* **82**: 22.
García, F. (1987). *Las Aves de Cuba: Subespecies Endémicas*. Vol. 2. Editorial Gente Nueva, La Habana.
García, J., Arctander, P. & Fjeldså, J. (1998). Pre-pleistocene differentiation among chat-tyrants. *Condor* **100(4)**: 629-640.
García, J.A. & Serrano, M.C. (2003). Totovía *Lullula arborea*. Pp. 376-377 in: Martí & del Moral (2003).
García, J.A., Contreras, A.J. & González, J.I. (1997). Estructura trófica y cambios estacionales de las aves en el Matorral Desértico Microfilo (*Larrea tridentata*) en el Valle de Cuatrociénagas, Coahuila, México. Pp. 49-55 in: Dickerman (1997).
García, M.D. & Vilina, Y. (1994). Nuevo registro del Pájaro Amarillo (*Pseudocolopterix flaviventris*). *Bol. Chileno Orn.* **1**: 23.
Garner, M. (1999). An interesting Shore Lark in Ireland. *Birding World* **12(4)**: 152-154.
Garnett, S.T. ed. (1993). *Threatened and Extinct Birds of Australia*. 2nd corrected edition. RAOU Report **82**. Royal Australasian Ornithologists Union, Victoria.
Garnett, S.T. & Crowley, G.M. (2000). *The Action Plan for Australian Birds 2000*. Environment Australia, Canberra.
Garoche, J. (1999). Cochevis huppé *Galerida cristata*. Pp. 308-309 in: Rocamora & Yeatman-Berthelot (1999).
Garoche, J. & Sohier, A. (2000). Biologie de reproduction du Pipit maritime *Anthus petrosus petrosus* Montagu en Bretagne: chronologie annuelle des pontes et paramètres démographiques généraux. *Alauda* **68(1)**: 11-25. In French with English summary.
Garoche, J. & Sohier, A. (2001). Biologie de reproduction du Pipit maritime, *Anthus petrosus petrosus*, Montagu en Bretagne: paramètres démographiques spécifiques. *Alauda* **69(3)**: 397-412. In French with English summary.
Garoche, J. & Sohier, A. (2002). La biologie du Pipit maritime *Anthus petrosus petrosus* Montagu en Bretagne: mortalité juvénile. [The biology of Rock Pipit *Anthus petrosus petrosus* Montagu in Brittany: juvenile mortality]. *Alauda* **70(4)**: 451-459. In French with English summary.
Garoche, J., Sohier, A. & Le Grall, E. (1997). Sur la biologie de reproduction du Pipit maritime *Anthus petrosus* en Bretagne: trois nichées consécutives et réussies par un même couple. [On the biology of the reproduction of the Rock Pipit *Anthus petrosus* in Brittany: three consecutive successful clutches raised by the same pair]. *Alauda* **65(2)**: 151-154.
Garoche, J., Sohier, A. & Le Grall, E. (1998). La biologie du Pipit maritime *Anthus petrosus petrosus* Montagu en Bretagne: Calendrier biologique annuel. [Biology of Rock Pipits *Anthus petrosus petrosus* Montagu in Brittany, yearly biological calendar]. *Alauda* **66(2)**: 103-111. In French with English summary.
Garrett, K. & Dunn, J. (1981). *Birds of Southern California*. Los Angeles Audubon Society, Los Angeles, California.
Garrick, A.S. (1981). Diets of pipits and skylarks at Huiarua Station, Tokomaru Bay, North Island, New Zealand. *New Zealand J. Ecol.* **4**: 106-114.
Garrido, O.H. (1978). Nuevo Bobito Chico (Aves: Tyrannidae) para Cuba. *Inf. Cient.-Téc. Acad. Cienc. Cuba* **68**: 1-6.
Garrido, O.H. (1988). *La Migración de las Aves en Cuba. [Migration of Birds in Cuba]*. Publicaciones de la Asociación de Amigos de Doñana, Sevilla. Spain.
Garrido, O.H. & García, F. (1975). *Catálogo de las Aves de Cuba*. Academia de Ciencias de Cuba. La Habana.
Garrido, O.H. & Kirkconnell, A. (2000). *Birds of Cuba*. Christopher Helm, London.
Garrido, O.H., Peterson, A.T. & Komar, O. (1999). Geographic variation and taxonomy of the Cave Swallow (*Petrochelidon fulva*) complex, with the description of a new subspecies from Puerto Rico. *Bull. Brit. Orn. Club* **119(2)**: 80-91.
Garrison, B.A. (1999). Bank Swallow (*Riparia riparia*). No. **414** in: Poole & Gill (1997).
Garrison, B.A., Humphrey, J.M. & Laymon, S.A. (1987). Bank Swallow distribution and nesting ecology on the Sacramento River, California. *Western Birds* **18**: 71-76.
Garrod, A.H. (1877). On the anatomical characters distinguishing the swallow and the swift. *Zoologist* **1**: 217-220.
Gartshore, M.E. (1989). *An Avifaunal Survey of Taï National Park, Ivory Coast. 28 January - 11 April 1989*. ICBP Study Report **39**. Cambridge.
Gartshore, M.E., Taylor, P.D. & Francis, I.S. (1995). *Forest Birds in Côte d'Ivoire. A Survey of Taï National Park and other Forest and Forestry Plantations, 1989-1991*. BirdLife Study Report **58**. BirdLife International, Cambridge.
Garza, V. & Suárez, F. (1989). Aves en la lista roja. La Alondra de Dupont. *La Garcilla* **74**: 8-10.
Garza, V. & Suárez, F. (1990). Distribución, población y selección de hábitat de la Alondra de Dupont (*Chersophilus duponti*) en la Península Ibérica. *Ardeola* **37(1)**: 3-12.
Garza, V., Suárez, F. & Tella, J.L. (2003). Alondra de Dupont *Chersophilus duponti*. Pp. 364-365 in: Martí & del Moral (2003).
Garza, V., Traba, J. & Suárez, F. (2003). Is the European population of Dupont's Lark *Chersophilus duponti* adequately estimated? *Bird Study* **50**: 309-311.
Gaston, A.J. (1970). Birds in the central Sahara in winter. *Bull. Brit. Orn. Club* **90(2)**: 53-66.
Gatter, W. (1988). The birds of Liberia (West Africa). A preliminary list with status and open questions. *Verh. Orn. Ges. Bayern* **24**: 689-723.
Gatter, W. (1997). *Birds of Liberia*. Pica Press, Nr. Robertsbridge, UK.
Gatter, W. & Behrndt, M. (1985). Unterschiedliche tageszeitliche Zugmuster alter und junger Vögel am Beispiel der Rauchschwalbe (*Hirundo rustica*). *Vogelwarte* **33(2)**: 115-120.
Gaunt, A.S. (1965). Fossorial adaptations in the Bank Swallow, *Riparia riparia* (Linnaeus). *Univ. Kansas Sci. Bull.* **46**: 99-146.

Gaunt, A.S. (1969). Myology of the leg in swallows. *Auk* **86(1)**: 41-53.
Gauthier, M. & Thomas, D.W. (1993a). Nest site selection and cost of nest building by Cliff Swallows (*Hirundo pyrrhonota*). *Can. J. Zool.* **71(6)**: 1120-1123.
Gauthier, M. & Thomas, D.W. (1993b). Relative success of second nesting attempts by Cliff Swallows (*Hirundo pyrrhonota*) in Sherbrooke, Quebec. [Succès relatif de deux tentatives consécutives de nidification chez l'Hirondelle à front blanc (*Hirundo pyrrhonota*) à Sherbrooke, Québec]. *Can. J. Zool.* **71(5)**: 1055-1059. In English with French summary.
Gavrilov, E.I. (1999). [*Fauna and Distribution of the Birds of Kazakhstan*]. Published privately, Almaty, Kazakhstan. In Russian.
Gavrilov, E.I. & Savchenko, A.P. (1991). [On species validity of the Pale Sand Martin (*Riparia diluta* Sharpe & Wyatt 1893)]. *Byull. Mosk. Obshch. Ispyt. Prir. Otd. Biol.* **96**: 34-44. In Russian with English summary.
Gee, J.P. (1984). The birds of Mauritania. *Malimbus* **6(1&2)**: 31-66.
Gelis, R.A. & Martínez, F. (2000). Nest and nestling description of Grey-collared Becard *Pachyramphus major* in the highlands of Michoacán, Mexico. *Cotinga* **14**: 47-48.
George, J. (1959). A composite swift-swallow nest. *J. Bombay Nat. Hist. Soc.* **56(1)**: 134.
George, P.V. (1976). *Hirundo rustica* moulting remiges while rearing nestlings in Iraq. *Bull. Basrah Nat. Hist. Mus.* **3**: 95-100.
George, P.V. & Al-Rawy, M. (1970). Growth studies on nestlings of Common Swallow *Hirundo rustica rustica*. *Bull. Iraq Nat. Hist. Mus.* **4**: 3-20.
George, T.L., Fowler, A.C., Knight, R.L. & McEwen, L.C. (1992). Impacts of a severe drought on grassland birds in western North Dakota. *Ecol. Appl.* **2**: 275-284.
Gergely, J. (1991). First occurrence of Rufous Skylark (*Calandrella rufescens* Vieill. 1820) in the Carpathian Basin. *Aquila* **98**: 107-109.
Germain, M. (1965). Observations ornithologiques en Algérie occidentale. *Oiseau et RFO* **35**: 117-134.
Germain, M., Dragesco, J., Roux, F. & Garcin, H. (1973). Contribution à l'ornithologie de Sud-Cameroun II. Passeriformes. *Oiseau et RFO* **43**: 212-259.
Germogenov, N.I. (1985). Biology of reproduction of the House Martin (*Delichon urbica*) in the Lena River Valley. *Zoologischeskii Zhurnal* **64**: 409-416.
Géroudet, P. (1979). Nidification de l'Hirondelle rousseline *Hirundo daurica* en Crète. *Alauda* **47(1)**: 39.
Géroudet, P. (1992). Pipit maritime *Anthus petrosus*. *Alauda* **60(2)**: 77-80.
Gerss, W. (1989a). Schätzung der durchschnittlichen Strophenlänge des Feldlerchengesanges (*Alauda arvensis*). *Zool. Anz.* **222(1-2)**: 27-36.
Gerss, W. (1989b). Messung von Einflüssen auf die Strophenlänge des Gesanges der Feldlerche (*Alauda arvensis*). [Measuring influences on the strophe length of the song of the Skylark]. *Zool. Anz.* **223(1-2)**: 33-42.
Gibb, J. (1956). Food, feeding, habits and territory of the Rock Pipit *Anthus petrosus*. *Ibis* **98(3)**: 506-530.
Gibbon, G. (1989a). Rhodes - Naudesnek. *Albatross* **297**: 9-10.
Gibbon, G. (1989b). Long-tailed Wagtails. *Albatross* **300**: 10.
Gibbons, D.W., Avery, M.I. & Brown, A.F. (1996). Population trends of breeding birds in the United Kingdom since 1800. *British Birds* **89**: 291-305.
Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993). *The New Atlas of Breeding Birds in Britain and Ireland 1988-1991*. T. & A.D. Poyser, Calton, UK.
Gibson, J.P. & Wheelwright, N.T. (1995). Genetic structure in a population of a tropical tree *Ocotea tenera* (Lauraceae): influence of avian seed dispersal. *Oecologia* **103(1)**: 49-54.
Gifford, E.W. (1919). Field notes on the land birds of the Galapagos Islands and of Cocos Island. *Proc. Calif. Acad. Sci.* **2**: 189-258.
Gilet, H. (1960). Observations sur l'avifaune du massif de l'Ennedi (Tchad). *Oiseau et RFO* **30**: 99-134.
Gill, B.J. (1996). A fossil bone of the Rifleman (*Acanthisitta chloris*) from Cape Reinga. *Notornis* **43(2)**: 113-114.
Gill, B.J. & Martinson, P. (1991). *New Zealand's Extinct Birds*. Random Century, Auckland, New Zealand.
Gillespie, J.A. (1934). The homing instinct in the Rough-winged Swallow. *Bird-Banding* **5**: 43-44.
Gillespie, T.W. & Walter, H. (2001). Distribution of bird species richness at a regional scale in tropical dry forest of Central America. *J. Biogeogr.* **28**: 651-662.
Gilliard, E.T. (1941). The birds of Mt. Auyan-Tepui, Venezuela. *Bull. Amer. Mus. Nat. Hist.* **77(9)**: 439-508.
Gilliard, E.T. (1950). Notes on a collection of birds from Bataan, Luzon, Philippine Islands. *Bull. Amer. Mus. Nat. Hist.* **94(8)**: 457-504.
Gilliard, E.T. (1959). Notes on the courtship behavior of the Blue-backed Manakin (*Chiroxiphia pareola*). *Amer. Mus. Novit.* **1942**: 1-19.
Gilliard, E.T. (1962). *On the Breeding Behaviour of the Cock-of-the-Rock (Aves, Rupicola rupicola)*. Bulletin of the American Museum of Natural History **124(2)**, New York. 68 pp.
Gilligan, F., Rogers, D., Smith, M. & Contreras, A. (1994). *Birds of Oregon*. Cinclus Publishers, McMinnville, Oregon.
Gillings, S. & Fuller, R.J. (2001). Habitat selection by Skylarks *Alauda arvensis* wintering in Britain in 1997/98. *Bird Study* **48(3)**: 293-307.
Ginn, P.J., McIlleron, W.G. & Milstein, P. le S. eds. (1989). *The Complete Book of Southern African Birds*. Struik Publishers Ltd, Cape Town.
Giraudo, A.R. & Baldo, J.L. (1998). Distribución y biología de *Phaeomyias murina* (Tyrannidae) en el nordeste de Argentina. *Hornero* **15(1)**: 1-9.
Giraudoux, P., Degauquier, R., Jones, P.J., Weigel, J. & Isenmann, P. (1988). *Avifaune du Niger: État des Connaissances en 1986*. Malimbus **10(1)**. 140 pp.
Giunchi, D., Mongini, E. & Baldaccini, N.E. (1999). The influence of repeated releases on the homing behaviour of Sand Martins (*Riparia riparia*). *Ethology* **105**: 111-124.
Glaubrecht, M. (1992). Sexuelle Selektion beim Feldlerchengesang. *Naturwiss. Rundsch.* **45(7)**: 274-275.
Glenister, A.G. (1971). *The Birds of the Malay Peninsula*. Oxford University Press, London.
Glue, D.E. & Morgan, R.A. (1972). Cuckoo hosts in British habitats. *Bird Study* **19**: 187-192.
Glutz von Blotzheim, U.N. (1962). *Die Brutvögel der Schweiz*. Schweizerische Vogelwarte, Sempach.
Glutz von Blotzheim, U.N. (1981). Der Brachpieper *Anthus campestris* - Brutvogel der Walliser Felsensteppe. [The Tawny Pipit *Anthus campestris* - breeding bird of the Walliser rocky grasslands]. *Orn. Beob.* **78(3)**: 212-214.
Glutz von Blotzheim, U.N. (1992). [Tree Pipit *Anthus trivialis* mobbing a Common Vole *Microtus arvalis*]. *Orn. Beob.* **89(3)**: 196. In German.
Glutz von Blotzheim, U.N. (2000). Beträchtlicher Arealverlust des Bergpiepers *Anthus spinoletta* infolge Eutrophierung seines Lebensraums und vollständige Verdrängung des Baumpiepers *Anthus trivialis* durch die Mähwirtschart. [Impact of eutrophication on distribution and demography of Water Pipit *Anthus spinoletta* and Tree Pipit *Anthus trivialis* in the prealps of Central Switzerland]. *Orn. Beob.* **97(4)**: 343-347.
Glutz von Blotzheim, U.N. (2003). Adoption de bâtiments comme sites de nidification par l'Hirondelle de rochers *Ptyonoprogne rupestris* en Valais: un phénomène en expansion. *Nos Oiseaux* **50(1)**: 1-14.
Glutz von Blotzheim, U.N. & Bauer, K.M. eds. (1985). *Handbuch der Vogel Mitteleuropas*. Vol. 10. Passeriformes. Akademische Verlagsgesellschaft, Wiesbaden, Germany.
Gnielka, R. (1985). Die Verbreitung der Heidelerche im Bezirk Halle. *Apus* **6**: 21-23.
Gochfeld, M. (1965). Purple Martin. *Gosse Bird Club Broadsheet* **4**: 22.
Gochfeld, M. (1978). Intraspecific social stimulation and temporal displacement of song of the Lesser Skylark, *Alauda gulgula*. *Z. Tierpsychol.* **48(4)**: 337-344.
Gochfeld, M. (1985). Numerical relationships between migrant and resident bird species in Jamaican woodlands. Pp. 654-662 in: Buckley *et al.* (1985).
Gochfeld, M., Keith, S. & Donahue, P. (1980). Records of rare or previously unrecorded birds from Colombia. *Bull. Brit. Orn. Club* **100(3)**: 196-201.
Godfrey, J. (1905). Domesticated lyrebird. *Emu* **5**: 33-34.
Godfrey, R. (1925). The Cape Wagtail. *Blythswood Review* **2**: 45-46.
Godfrey, R. (1932). Birds of the Eastern Cape Province. *Blythswood Review* **9**: 243-244.
Godfrey, R. (1934). Springtime in Brittany. *Blythswood Review* **11**: 330-331.
Godfrey, R. (1943). The South African Cliff Swallow. *Ostrich* **13(4)**: 219-226.
Godfrey, W.E. (1986). *The Birds of Canada*. Revised edition. National Museums of Canada, Ottawa.
Godlinsky, M. (1996a). Haltung und Zucht der Ohrenlerche (*Eremophila alpestris brandti*). *Europaische Vogelwelt* **1**: 10-19.
Godlinsky, M. (1996b). Haltung und Zucht der Kurzzehenlerche (*Calandrella brachydactyla hungarica*). *Europaische Vogelwelt* **2**: 27-33.
Godlinsky, M. (1996c). Haltung und Zucht der Heidelerche (*Lullula arborea arborea*). *Europaische Vogelwelt* **3**: 16-23.
Goeldi, E.A. (1894). On the nesting of *Phibalura flavirostris* and *Lochmias nematura*. *Ibis* **Ser. 6, no. 6**: 484-494.
Goerck, J.M. (2001). The creation of Murici Ecological Station. *World Birdwatch* **23(3)**: 21-23.
von Goethe, J.W. (1994). Die Haubenlerche - *Galerida cristata* (Linne 1758). "Trippelschritt" auf dem Rückzug. *Butspecht* **17(2-3)**: 36-38.
Gokula, V. & Vijayan, L. (1997). Birds of Mudumalai Wildlife Sanctuary, India. *Forktail* **12**: 107-116.
Goldberg, N.H. (1979). *Behavior Flexibility and Foraging Strategies in Cassin's and Western Kingbirds* (Tyrannus vociferans *and* T. verticalis) *Breeding Sympatrically in Riparian Habitats in Central Arizona*. PhD dissertation, University of Illinois, Champaign-Urbana, Illinois.
Gómez, G.M.R. (1988). *Eto-ecologia Evolutiva e Adaptativa da Comunicação Sonora em Andorinhas Neotropicais*. PhD thesis, Universidad Estadual de Campinas, São Paulo.
Gómez, I. & Aguilar, M.S. (1998). Aves migratorias neárticas en Bolivia. Pp. 92-97 in: Sagot & Guerrero (1998). (Panel discussion).
Gómez, M.F. & Amaya, J.D. (2002). *Phylloscartes lanyoni*. Pp. 338-341 in: Renjifo *et al.* (2002).
Gómez de Silva, H. (2002). New distributional and temporal records of Mexican birds. *Cotinga* **18**: 89-92.
Gómez de Silva, H., González-García, F. & Casillas-Trejo, M.P. (1999). Birds of the upper cloud forest of El Triunfo, Chiapas, Mexico. *Orn. Neotropical* **10(1)**: 1-26.
Gonzaga, L.P. (1997). Kinglet Calyptura survives in south-east Brazil! *Cotinga* **7**: 9.
Gonzaga, L.P. (2002). A difícil questão da posição sistemática de *Phylloscartes difficilis* ou: quem sabe dizer o que é um *Phylloscartes*? *Atualidades Orn.* **107**: 12-13.
Gonzaga, L.P. & Pacheco, J.F. (1995). A new species of *Phylloscartes* (Tyrannidae) from the mountains of southern Bahia, Brazil. *Bull. Brit. Orn. Club* **115(2)**: 88-97.
Gonzaga, L.P., Pacheco, J.F., Bauer, C. & Castiglioni, G.D.A. (1995). An avifaunal survey of the vanishing montane Atlantic forest of southern Bahia, Brazil. *Bird Conserv. Int.* **5**: 279-290.
González, C. & Lorenzo, J.A. (2001). La Terrera Marismeña del norte de la isla de Tenerife está a punto de extinguirse. *Quercus* **185**: 53.
González, J.I., Contreras, A.J. & Badii, M.H. (1997). Estudio preliminar de la ornitofauna reproductora del Matorral Alto Espinoso (*Prosopis glandulosa - Acacia greggii*) del Valle de Cuatrociénagas, Coahuila, México. Pp. 57-60 in: Dickerman (1997).
González, O., Torres, L. & Tello, A. (2001). First records of Purple Martin *Progne subis* in coastal Peru. *Cotinga* **15**: 65-66.
González-García, F. (1993). *Avifauna de la Reserva de la Biosfera "Montes Azules", Selva Lacandona, Chiapas, México*. Acta Zoológica Mexicana (Nueva Serie) **55**. 86 pp.
González-Guzmán, L.I. & Mehlman, D.W. (2001). Developmental stability across the breeding distribution of the Scissor-tailed Flycatcher (*Tyrannus forficatus*). *Ecol. Letters* **4(5)**: 444.
Goodall, J.D., Johnson, A.W. & Philippi, R.A. (1956). *Las Aves de Chile*. Vol. 1. Platt Establecimientos Gráficos, Buenos Aires.
Goodbody, I.M. (1950). Sky-lark migration in S.E. Ireland. *British Birds* **43**: 265-273.
Goodbody, I.M. (1953). The autumn migration of Skylarks in Ireland. *Irish Nat. J.* **11**: 47-50.
Goodman, S.M. (1982). A test of nest cup volume and reproductive success in the Barn Swallow. *Jack-Pine Warbler* **60**: 107-112.
Goodman, S.M. & Ames, P.L. (1983). A contribution to the ornithology of the Siwa Oasis and Qattara Depression, Egypt. *Sandgrouse* **5**: 82-96.
Goodman, S.M. & Watson, G.E. (1983). Bird specimen records of some uncommon or previously unrecorded forms in Egypt. *Bull. Brit. Orn. Club* **103(3)**: 101-106.
Goodman, S.M., Meininger, P.L., Baha el Din, S.M., Hobbs, J.J. & Mullié, W.C. eds. (1989). *The Birds of Egypt*. Oxford University Press, Oxford & New York.
Gopfert, M. (1986). [Investigations of a communal roost of hibernating Grey Wagtails (*Motacilla cinerea*) in Schwabisch hall (Baden-Wurttemberg)]. *Ecol. Birds* **8(2)**: 199-214. In German with English summary.
Gore, M.E.J. (1990). *The Birds of The Gambia. An Annotated Check-list*. BOU Check-list 3. 2nd revised edition. British Ornithologists' Union, London.
Gore, M.E.J. & Gepp, A.R.M. (1978). *Las Aves del Uruguay*. Mosca Hermanos, Montevideo.
Gore, M.E.J. & Won Pyongoh (1971). *The Birds of Korea*. Royal Asiatic Society, Seoul.
Goriup, P.D. (1988a). The avifauna and conservation of steppic habitats in western Europe, North Africa and the Middle East. Pp. 145-158 in: Goriup (1988b).
Goriup, P.D. ed. (1988b). *Ecology and Conservation of Grassland Birds*. ICBP Technical Publication **7**, Cambridge.
Goroshko, O.A. (1993). [Taxonomic status of the Pale (Sand?) Martin *Riparia* (*riparia*?) *diluta* (Sharpe & Wyatt 1893)]. *Russ. J. Orn.* **2**: 303-323. In Russian.
Gorski, L.J. (1969a). *Systematics and Ecology of Sibling Species of Traill's Flycatcher*. PhD dissertation, University of Connecticut, Storrs, Connecticut.
Gorski, L.J. (1969b). Traill's Flycatcher of the "fitz-bew" songform wintering in Panama. *Auk* **86(4)**: 745-747.
Gorski, L.J. (1970). Banding the two songforms of Traill's Flycatcher. *Bird-Banding* **41(3)**: 204-206
Gorski, W. (1982). [Migration and wintering of Shore Lark (*Eremophila alpestris*), Twite (*Acanthis flavirostris*) and Snow Bunting (*Plectrophenax nivalis*) on the middle part of Polish Baltic coast in the years 1972-1979]. *Notatki Orn.* **23(1-4)**: 3-13. In Polish with English summary.
Gosse, P.H. (1847). *The Birds of Jamaica*. John van Voorst, London.
Gosselin, M. (2000). Taxonomy of the Cave Swallow *Petrochelidon fulva*. *Birders J.* **9**: 36.
Gottschalk, H. (1982). Orange-throated Longclaw - unusual feeding method. *Promerops* **153**: 5.
Gottschalk, H. (1985). Unseasonal breeding records: Orange-throated Longclaw. *Promerops* **169**: 13.
Gould, J. (1853). Nest and egg of *Menura alberti*. *Illustrated London News* **March 19th**.
Graber, R.R., Graber, J.W. & Kirk, E.L. (1974). *Illinois Birds: Tyrannidae*. Illinois Natural History Survey Biological Notes **86**.
Grafton, S. (1997). A Blue Swallow success story. *Africa. Birds & Birding* **2(3)**: 22-24.
Graham, G.L., Graves, G.R., Schulenberg, T.S. & O'Neill, J.P. (1980). Seventeen bird species new to Peru from the Pampas de Heath. *Auk* **97(2)**: 366-370.
Granholm, S.L. (1982). *Effects of Surface Fires on Birds and their Habitat Associations in Coniferous Forests of the Sierra Nevada, California*. PhD dissertation, University of California, Davis, California.
Granit, B. (1999). Thick-billed Lark - a new breeding bird for Israel. *Birding World* **12(6)**: 240-241.
Granizo, T. ed. (2002). *Libro Rojo de las Aves del Ecuador*. SIMBIOE, Conservation International, UICN, Ministerio del Medio Ambiente & EcoCiencia, Quito.
Granizo, T., Guerrero, M., Pacheco, C., Phillips, R., Ribadeneira, M.B. & Suárez, L. (1997). *Lista de Aves Amenazadas de Extinción en el Ecuador*. UICN-Sur, CECIA, INEFAN, EcoCiencia & BirdLife International, Quito.
Grant, G.S. & Quay, T.L. (1977). Breeding biology of Cliff Swallows in Virginia. *Wilson Bull.* **89(2)**: 286-290.
Grant, L. & Lewis, A.D. (1984). Breeding of the Ethiopian Swallow *Hirundo aethiopica* in interior Africa. *Scopus* **8**: 67-72.
Grant, P.J. (1972). Field identification of Richard's and Tawny Pipits. *British Birds* **65**: 287-290.
Grant-Mackie, E.J. & Grant-Mackie, J.A. (1994). A New Zealand evolutionary story: the wrens. *New Zealand Sci. Teacher* **76**: 17-22.
Graves, G.R. (1981). Brightly coloured plumage in female manakins (*Pipra*). *Bull. Brit. Orn. Club* **101(1)**: 270-271.
Graves, G.R. (1988a). *Phylloscartes lanyoni*, a new species of bristle-tyrant (Tyrannidae) from the lower Cauca Valley of Colombia. *Wilson Bull.* **100(4)**: 529-534.
Graves, G.R. (1988b). Trans-Andean population of the Large-headed Flatbill *Ramphotrigon megacephala*. *Bull. Brit. Orn. Club* **108(4)**: 186-187.
Graves, G.R. (1990). Function of crest displays in Royal Flycatchers *Onychorhynchus*. *Condor* **92(2)**: 522-524.
Graves, G.R. (1993). A new hybrid manakin (*Dixiphia pipra* x *Pipra filicauda*) (Aves: Pipridae) from the Andean foothills of eastern Ecuador. *Proc. Biol. Soc. Washington* **106(3)**: 436-441.
Graves, G.R. & Zusi, R.L. (1990). Avian body weights from the lower Rio Xingu, Brazil. *Bull. Brit. Orn. Club* **110**: 20-25.
Graves, G.R., Robbins, M.B. & Remsen, J.V. (1983). Age and sexual difference in spatial distribution and mobility in manakins (Pipridae): inferences from mist-netting. *J. Field Orn.* **54(4)**: 407-412.
Gray, R.S. (1969). Breeding biology of Rifleman at Dunedin. *Notornis* **16(1)**: 5-22.
Greaves, R.H. (1941). Behaviour of White Wagtails wintering in Cairo District. *Ibis* **Ser. 14, no. 5**: 459-462.
Green, A.A. (1983). The birds of Bamingui-Bangoran National Park, Central African Republic. *Malimbus* **5(1)**: 17-30.
Green, G. (1997a). Taxonomic round-up. Yungas Tody-tyrant *Hemitriccus spodiops* is a member of the subgenus *Snethlagea*. *Cotinga* **7**: 12.
Green, G. (1997b). Taxonomic round-up. The taxonomic status of Reiser's Tyrannulet *Phyllomias reiseri*. *Cotinga* **7**: 11-12.
Green, G. (1998). Taxonomic round-up. *Cotinga* **9**: 13-14.

Green, G. (2001a). Taxonomic round-up. New analysis demostrates that Pale-tipped Tyrannulet is two species. *Cotinga* **15**: 6.
Green, G. (2001b). Taxonomic round-up. A newly described flycatcher from the cerrado of central South America. *Cotinga* **16**: 12.
Green, G. (2002a). Taxonomic round-up. A new *Myiopagis* elaenia from eastern Peru and eastern Ecuador. *Cotinga* **17**: 11.
Green, G. (2002b). Taxonomic round-up. A new tyrannulet from the white-sand forests of Peru. *Cotinga* **17**: 11.
Green, G. (2002c). Taxonomic round-up. A new *Poecilotriccus* from northern Peru. *Cotinga* **17**: 11.
Green, R.E. (1978). Factors affecting the diet of farmland Skylarks, *Alauda arvensis*. *J. Anim. Ecol.* **47(3)**: 913-928.
Green, R.E. (1980). Food selection by Skylarks and grazing damage to sugar beet seedlings. *J. Appl. Ecol.* **17(3)**: 613-630.
Green, R.E. (1985). Lark. Pp. 319-320 in: Campbell & Lack (1985).
Green, R.E. (1991). The relevance of population studies to the conservation of threatened birds. Pp. 594-633 in: Perrins *et al.* (1991).
Green, R.E. & Hirons, J.M. (1991). The relevance of population studies to the conservation of threatened birds. Pp. 594-633 in: Perrins *et al.* (1991).
Green, R.H. (1966). Gut contents of some Tasmanian birds. *Emu* **66**: 105-112.
Greenberg, R. (1992). Forest migrants in non-forest habitats on the Yucatan Peninsula. Pp. 273-286 in: Hagan & Johnston (1992).
Greenberg, R., Bichier, P., Angon, A.C. & Reitsma, R. (1997). Bird populations in shade and sun coffee plantations in central Guatemala. *Conserv. Biol.* **11**: 448–459.
Greeney, H.F., Gelis, R.A. & White, R. (2004). Notes on breeding birds from an Ecuadorian lowland forest. *Bull. Brit. Orn. Club* **124(1)**: 28-37.
Greenfield, P.J. (2002). Doradito Subtropical. *Pseudocolopteryx acutipennis*. Page 303 in: Granizo (2002).
Greenway, J.C. (1967). *Extinct and Vanishing Birds of the World*. Dover Publications, New York.
Gregory, M.R. (1978). Accidental dispersal of the Welcome Swallow through "hitch-hiking" on ships. *Notornis* **25(1)**: 91-94.
Gregory, P. (1994). Fairy Martin *Hirundo ariel* at Tabubil. *Muruk* **6(3)**: 45.
Gregory, P. (1995). *The Birds of the OK Tedi Area*. National Library of Papua New Guinea, Tabubil, Papua New Guinea.
Gregory, P., Burrows, R. & Burrows, G. (1996). Red-rumped Swallow at Manokwari, a new species for Irian Jaya. *Kukila* **8**: 153.
Greig-Smith, P.W. (1976). The composition and habitat preferences of the avifauna of Mole National Park, Ghana. *Bull. Niger. Orn. Soc.* **12(42)**: 49-66.
Greiner, E.C., Putnam, M.S. & Goodman, S.M. (1996). Blood parasites from birds in the Reserve Naturelle Integrale d'Andringitra, Madagascar. *Fieldiana Zool.* **85**: 142-143.
Gressel, J. & Petersen, B. (1981). Beobachtung eines Balztanzes beim Wasserpieper (*Anthus spinoletta*). *Vogelwelt* **102(3)**: 106-107.
Grewal, B. (1995). *A Photographic Guide to Birds of India and Nepal*. New Holland, London.
Grieve, A., Baha el Din, M. & Baha el Din, S.M. (2001). The occurrence of Long-billed Pipit *Anthus similis* in Egypt. *Sandgrouse* **23**: 39-43.
Griffiths, G.A. & Holyoak, D.T. (1993). Tree Martins occupying Fairy Martin nests. *Austr. Bird Watcher* **15(2)**: 93.
Grimes, L.G. (1987). *The Birds of Ghana. An Annotated Check-list*. BOU Check-list **9**. British Ornithologists' Union, London.
Grimm, H. (2000). Historical and current status of the Crested Lark *Galerida cristata* in Thüringen. *Anz. Ver. Thüring. Orn.* **4(1)**: 59-76.
Grimmett, R. (1987). *A Review of the Problems Affecting Palearctic Migratory Birds in Africa*. ICBP Technical Publication **22**. Cambridge.
Grimmett, R., Inskipp, C. & Inskipp, T. (1998). *Birds of the Indian Subcontinent*. Christopher Helm, London.
Grimmett, R., Inskipp, C. & Inskipp, T. (2000). *Birds of Nepal*. Christopher Helm, London.
Grindley, J., Siegfried, W.R. & Vernon, C.J. (1973). Diet of the Barn Owl in the Cape Province. *Ostrich* **44**: 266-267.
Grinnell, J. (1928). Notes on the systematics of west American birds. Part III. *Condor* **30(3)**: 185–189.
Grinnell, J. & Linsdale, J.M. (1936). *Vertebrate Animals of Point Lobos Reserve, 1934–1935*. Carnegie Institution of Washington **481**.
Grinnell, J. & Miller, A.H. (1944). *Distribution of the Birds of California*. Pacific Coast Avifauna **27**. Cooper Ornithological Society, Berkeley, California. 608 pp.
Griscom, L. (1926). The ornithological results of the Mason-Spinden Expedition to Yucatán. Part II. Chinchorro Bank and Cozumel Island. *Amer. Mus. Novit.* **236**: 1-13.
Griscom, L. (1929). Notes on the Rough-winged Swallow [*Stelgidopteryx serripennis* (Aud)] and its allies. *Proc. New England Zool. Club* **11**: 67-72.
Griscom, L. (1930). Critical notes on Central American Birds. *Proc. New England Zool. Club* **12**: 1-8.
Griscom, L. (1932). *The Distribution of Bird-life in Guatemala*. Bulletin of the American Museum of Natural History **64**. New York.
Griscom, L. (1934). The ornithology of Guerrero, Mexico. *Bull. Mus. Comp. Zool.* **75**: 367-422.
Griscom, L. (1935). The birds of the Sierra de las Minas, eastern Guatemala. *Ibis* **Ser. 13, no. 5**: 807-817.
Griscom, L. (1950). Distribution and origin of the birds of Mexico. *Bull. Mus. Comp. Zool.* **103(6)**: 341-382.
Griscom, L. & Snyder, D.E. (1955). *The Birds of Massachusetts: an Annotated and Revised Checklist*. Peabody Museum, Salem, Massachusetts.
Grobler, N. (1986). Toevoegings tot Bloemfontein voëllys. *Mirafra* **3(2)**: 28.
Grobler, S. & Grobler, N. (1988). Breeding attempt of a pair of Greater Striped Swallow in suburban environment. *Mirafra* **5**: 54-56.
Groh, W. & Abs, M. (1963). Hautgeschwülste an den Hintergliedmaßen von Haubenlerchen (*Galerida cristata*). *Vogelwarte* **22(1)**: 20-23.
Gross, D.A. & Lowther, P.E. (2001). Yellow-billed Flycatcher (*Empidonax flaviventris*). No. **566** in: Poole, A.F. & Gill, F.B. eds. (2001). *The Birds of North America*. Vol. 15. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Groth, J.G. (1998). Molecular phylogenetics of finches and sparrows: consequences of character state removal in cytochrome b sequences. *Mol. Phylogen. Evol.* **10(3)**: 377-390.
Grubb, T.C. (1973). Absence of individual distance in the Tree Swallow during adverse weather. *Auk* **90(2)**: 432-433.
Grue, C.E., O'Shea, T.J. & Hoffman, D.J. (1984). Lead concentrations and reproduction in highway-nesting Barn Swallows. *Condor* **86(4)**: 383-389.
Grünhagen, H. & Mebs, T. (1987). [New breeding locations of the Red-rumped Swallow (*Hirundo daurica*) in Serbia]. *Vogelwelt* **108(1)**: 34-35. In German.
Grussu, M. & Biondi, M. (2004). Record numbers of wintering Richard's Pipits in the Western Palearctic. *British Birds* **97(4)**: 194-195.
Grzybowski, J.A. (1976). Habitat selection among some grassland birds wintering in Oklahoma. *Ann. Okla. Acad. Sci.* **1976**: 176-182.
Grzybowski, J.A. (1979). Responses of Barn Swallows to eggs, young, nests, and nest sites. *Condor* **81(3)**: 236-246.
Grzybowski, J.A. (1983a). Patterns of space use in grassland bird communities during winter. *Wilson Bull.* **95(4)**: 591-602.
Grzybowski, J.A. (1983b). Sociality of grassland birds during winter. *Behav. Ecol. Sociobiol.* **13(4)**: 211-219.
Guan Guosheng, Zhu Zuobin *et al.* (1988). Breeding ecology of the House Martin, *Delichon urbica*. *Chinese Wildlife* **2**: 9-11.
Gubitz, C. (1982). Zur Verbreitung, Bestandsgröße und Ökologie der Haubenlerche *Galerida cristata* im östlichen Oberfranken. [On the distribution, population and ecology of the Crested Lark *Galerida cristata* in eastern Franconia]. *Anz. Orn. Ges. Bayern* **21(1-2)**: 87-95.
Gubitz, C. (1983). Beobachtungen zur Biologie der Haubenlerche *Galerida cristata*. [Observation on the biology of the Crested Lark *Galerida cristata*]. *Anz. Orn. Ges. Bayern* **22(3)**: 177-196.
Guerra, E.R. (1969). Golondrinas que invernan. *Hornero* **11**: 59-60.
Guerra, T.J. & Marini, M.Â. (2002). Bird frugivory on *Struthanthus concinnus* (Loranthaceae) in southeastern Brazil. *Ararajuba* **10(2)**: 187-192.
Guerrero, J. & Arambiza, A. (2001). *Lista Preliminar de las Aves del Parque Nacional Kaa-Iya del Gran Chaco e Izozog, Santa Cruz, Bolivia*. Sociedad para la Conservación de la Vida Silvestre & Capitanía del Alto y Bajo Izozog, Santa Cruz, Bolivia.
Guerrero, M. (2002a). Cuervo Higuero Golirrojo. *Pyroderus scutatus remseni*. Page 176 in: Granizo (2002).
Guerrero, M. (2002b). Cotinga Ventricastaña. *Doliornis remseni*. Pp. 312-313 in: Granizo (2002).
Guerrieri, G., Santucci, B., Castaldi, A. & De Vita, S. (1997). Biologia riproduttiva della Calandra, *Melanocorypha calandra*, nell'Italia centrale. [Reproductive biology of the Calandra Lark, *Melanocorypha calandra*, in central Italy]. *Riv. Ital. Orn.* **67(2)**: 133-150.
Guichard, G. (1960). Sur la biologie de l'Alouette calandrelle (*Calandrella b. brachydactyla* Leis.). *Oiseau* **30**: 239-245.
Guichard, G. (1963). Notes sur le Cochevis de Thekla (*Galerida malabarica theklae* Brehm). *Oiseau* **33**: 183-188.
Guichard, K.M. (1955). The birds of Fezzan and Tibesti. *Ibis* **97(3)**: 393-424.
Guillory, H.D. & LeBlanc, D.J. (1975). Mobbing and other interspecific aggression by Barn Swallows. *Wilson Bull.* **87(1)**: 110-113.
Guitián, J., Sánchez, J.L., de Castro, A. & Bas, S. (1980). Sobre *Hirundo rupestris* (Scop.) en Galicia. *Ardeola* **25**: 181-191.
Guix, J.C. (1995). *Aspectos da Frugivoria, Disseminação e Predação de Sementes por Vertebrados nas Florestas Nativas do Estado de São Paulo, Sudeste do Brasil*. PhD thesis, Universitat de Barcelona, Barcelona.
Guix, J.C. & Ruiz, X. (2000). Plant-disperser-pest evolutionary triads: how widespread are they? *Oris* **15**: 121-126.
Guix, J.C., Tabánez, A.A.J., da Silva, A.N., López, C., Martínez, C., Matheu, E., de Souza, F.L., Pisciotta, K.R., Bradbury, N. & Portilho, W.G. (1992). *Viagem de Reconhecimento Científico a algumas Áreas Desconhecidas da Fazenda Intervales, Estado de São Paulo, Durante o Período de 04 a 16 de Outubro de 1991*. Grupo de Estudos Ecológicos Série Documentos **4**. São Paulo.
Gullion, G.W. (1947a). Use of artificial nesting sites by Violet-green and Tree Swallows. *Auk* **64(3)**: 411-415.
Gullion, G.W. (1947b). Post-nuptial copulation among swallows. *Auk* **64(4)**: 617.
Gullion, G.W. (1980). Purple Martins feeding on tent caterpillars. *Loon* **52**: 190-191.
Gundlach, J. (1873). *Catálogo de las Aves Cubanas*. Anales de la Sociedad Española de Historia Natural **2**, Madrid. 191 pp.
Gunski, R.J., Cabanne, G.S., Ledesma, M.A. & Garnero, A. del V. (2000). Análisis cariotípico de siete especies de tiránidos (Tyrannidae). *Hornero* **15**: 103-109.
von Gunten, K. (1961). Zur Ernährungsbiologie der Mehlschwalbe *Delichon urbica*. Die qualitative Zusammensetzung der Nahrung. *Orn. Beob.* **58**: 13-34.
von Gunten, K. (1963). Untersuchungen an einer Dorfgemeinschaft von Mehlschwalben. *Orn. Beob.* **60**: 1-11.
von Gunten, K. & Schwarzenbach, F.H. (1962). Zur Ernährungsbiologie der Mehlschwalbe. Quantitative Untersuchungen am Nestlingsfutter. *Orn. Beob.* **59**: 1-22.
Guo Ling (1977). [A preliminary study on the breeding ecology of the Crested Lark *Galerida cristata*]. *Chinese J. Zool.* **22(2)**: 41-43. In Chinese.
Guo Ling (1992). Observations on the breeding ecology of Mongolian Skylark. *Zool. Res.* **13(1)**: 59-65.
Gustafson, T., Lindqvist, B., Gotborn, L., Gyllin, R., Magnusson, A., Nihlen, A. & Strid, C. (1985). Flight altitudes and homing in swifts *Apus apus* and House Martins *Delichon urbica*. *Ornis Scand.* **16**: 239-243.
Gustafsson, J. & Wahlén, L. (1985). Hur mår trädlärkorna?. [What is happening with the Woodlark *Lullula arborea*?] *Fåglar i Sörmland* **18**: 42-46.
Guy, R. (1990). Underberg District: spring 1990. *Albatross* **304**: 6-8.
Guzmán, A. (1998). Aves de la provincia chaqueña Hernando Siles, Dpto. Chuquisaca. Pp. 101-104 in: Sagot & Guerrero (1998). (Panel discussion).
Gyldenstolpe, N. (1941). Preliminary diagnoses of some new birds from the Brazilian Amazonas. *Arkiv för Zool.* **33(12)**: 1-10.
Gyldenstolpe, N. (1945a). *The Bird Fauna of Rio Juruá in Western Brazil*. Kungl. Svenska Vetenskapsakademiens Handlingar **22**. 338 pp.
Gyldenstolpe, N. (1945b). *A Contribution to the Ornithology of Northern Bolivia*. Kungl. Svenska Vetenskapsakademiens Handlingar **23**. 300 pp.
Gyldenstolpe, N. (1950). *The Ornithology of the Rio Purús Region in Western Brazil*. Arkiv för Zoologi (Ser. 2) **1**. 320 pp.
Haas, W. (1969). Observations ornithologiques dans le nord-ouest de l'Afrique. *Alauda* **37**: 28-36.
Hable, E., Sackl, P. & Samwald, O. (1991). Zur Brutverbreitung und Arealausweitung der Felsenschwalbe (*Ptyonoprogne rupestris*) in der Steiermark (Aves). *Mitt. Abt. Zool. Landesmuseum Joanneum* **45**: 11-22.
Hadarics, T. (1996). [Identification of Citrine Wagtail]. *Túzok* **1**: 2-18. In Hungarian with English summary.
Hadden, D. (1981). *Birds of the North Solomons*. Wau Ecology Institute Handbook **8**. Wau Ecology Institute, Wau, Papua New Guinea.
Haffer, J. (1967). *Speciation in Colombian Forest Birds West of the Andes*. American Museum Novitates **2294**. 57 pp.
Haffer, J. (1971). Nachtrag zur Verbreitung von *Pipra fasciicauda* und *Pipra iris* in Brasilien. *J. Orn.* **112(4)**: 460-461.
Haffer, J. (1974). *Avian Speciation in Tropical South America. With a Systematic Survey of the Toucans (Ramphastidae) and Jacamars (Galbulidae)*. Publications of the Nuttall Ornithological Club **14**. Cambridge, Massachusetts. 390 pp.
Haffer, J. (1975). *Avifauna of Northwestern Colombia, South America*. Bonner Zoologische Monographien **7**. Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn. 182 pp.
Haffer, J. (1985). Avian zoogeography of the Neotropical lowlands. Pp. 113-146 in: Buckley *et al.* (1985).
Haffer, J. (1997a). Foreword: species concepts and species limits in ornithology. Pp. 11-24 in: del Hoyo, J., Elliott, A. & Sargatal, J. eds. *Handbook of the Birds of the World*, Vol. 4. Sandgrouse to Cuckoos. Lynx Edicions, Barcelona.
Haffer, J. (1997b). Contact zones between birds of southern Amazonia. Pp. 281-305 in: Remsen (1997).
Haffer, J. (2002). A rare hybrid manakin (Aves, Pipridae) and the origin of vertebrate species in Amazonia. *Rudolstaedter Naturhist. Schr.* **4**(Suppl.): 47-73.
Haffer, J. & Borrero, J. (1965). On birds from northern Colombia. *Rev. Biol. Trop.* **13**: 29-53.
Haffer, J. & Fitzpatrick, J.W. (1985). Geographic variation in some Amazonian forest birds. Pp. 147-168 in: Buckley *et al.* (1985).
Hagan, J.M. & Johnston, D.W. eds. (1992). *Ecology and Conservation of Neotropical Migrant Landbirds*. Smithsonian Institution Press, Washington & London.
Hagemeijer, W.J.M. & Blair, M.J. eds. (1997). *The EBCC Atlas of European Breeding Birds: their Distribution and Abundance*. T. & A.D. Poyser, London.
Hails, C.J. (1979). A comparison of flight energetics in hirundines and other birds. *Comp. Biochem. Physiol.* **63A**: 581-585.
Hails, C.J. (1984). The breeding biology of the Pacific Swallow *Hirundo tahitica* in Malaysia. *Ibis* **126(2)**: 198-211.
Hails, C.J. & Bryant, D.M. (1979). Reproductive energetics of a free-living bird. *J. Anim. Ecol.* **48**: 471-482.
Hails, C.J. & Jarvis, F. (1987). *Birds of Singapore*. Times Editions, Singapore.
Halafoff, K.C. (1961). Notes on the lyrebird's song. *Victorian Naturalist* **78**: 79-81.
Hall, A.G. & Sibson, R.B. (1960). More records of Welcome Swallows. *Notornis* **9(1)**: 11-12.
Hall, B.P. (1957). Notes on specific identification in the Tawny Pipit *Anthus campestris*, Blyth's Pipit *A. godlewskii*, and Richard's Pipit *A. novaeseelandiae* in Asia. *J. Bombay Nat. Hist. Soc.* **54(3)**: 726-731.
Hall, B.P. (1959). The Plain-backed Pipits of Angola. *Bull. Brit. Orn. Club* **79(7)**: 113-116.
Hall, B.P. (1960). The ecology and taxonomy of some Angolan birds. *Bull. Brit. Mus. (Nat. Hist.)* **6**: 369-453.
Hall, B.P. (1961). The taxonomy and identification of pipits (Genus *Anthus*). *Bull. Brit. Mus. (Nat. Hist.) Zool.* **7(5)**: 256-289.
Hall, B.P. (1963). The status of *Spizocorys razae* Alexander. *Bull. Brit. Orn. Club* **83(8)**: 133-134.
Hall, B.P. ed. (1974). *Birds of the Harold Hall Australian Expeditions*. British Museum of Natural History, London.
Hall, B.P. & Moreau, R.E. (1970). *An Atlas of Speciation in African Passerine Birds*. British Museum of Natural History, London.
Hall, J.R., Woods, R.W., Brooke, M.L. & Hilton, G.M. (2002). Factors affecting the distribution of landbirds on the Falkland Islands. *Bird Conserv. Int.* **12(2)**: 151-167.
Hallinan, T. (1924). Notes on some Panama Canal zone birds with special reference to their food. *Auk* **41(3)**: 304-326.
Halse, S.A. & Trevenen, H.J. (1986). Damage to cereal crops by larks in north-western Iraq. *Ann. Appl. Biol.* **108(2)**: 423-430.
Halupka, K. (1994). Incubation feeding in Meadow Pipit *Anthus pratensis* affects female time budget. *J. Avian Biol.* **25(3)**: 251-253.
Halupka, K. (1998a). Vocal begging by nestlings and vulnerability to nest predation in Meadow Pipits *Anthus pratensis*; to what extent do predation costs of begging exist? *Ibis* **140(1)**: 144-149.
Halupka, K. (1998b). Niittykirvisen pesiin kohdistuva saalistus koillis-puolassa. [Nest predation in Meadow Pipits *Anthus pratensis* nesting in natural conditions]. *Ornis Fenn.* **75(3)**: 139-143.
Hamel, J. (1972). Pipits, Skylarks and rainfall. *Notornis* **19(1)**: 20-25.
de Hamel, R. & McLean, I.G. (1989). Caging as a technique for rearing wild passerine birds. *J. Wildl. Manage.* **53(3)**: 852-856.
Hamilton, G.D. & Martin, R.F. (1985). Investigator perturbation and reproduction of the Cliff Swallow. *Auk* **102(1)**: 167-170.
Hamilton, N. (1981). Breeding the Welcome Swallow *Hirundo neoxena* and the Fairy Martin *Petrochelidon ariel* in captivity. *Aviculr. Mag.* **87(1)**: 3-5.

Hammer, U. (1993). Brutet der Kanarenpieper (*Anthus berthelotii*) in 3555m Höhe? *Orn. Mitt.* **45(9)**: 254-255.
Handrinos, G. & Akriotis, T. (1997). *The Birds of Greece*. Christopher Helm, London.
Haneda, K. & Ichikawa, T. (1967). [Life history of the Eastern Grey Wagtail (*Motacilla cinerea caspica*)]. *Jap. J. Ecol.* **17(1)**: 93-100: **17(11)**: 182-189. In Japanese with English summary.
Haneda, K. & Shinoda, T. (1969). A study of breeding biology of the Japanese Wagtail. *Misc. Rep. Yamashina Inst. Orn.* **5**: 602-622.
Hankins, B.D. (1963). Welcome Swallows nesting in Hawkes Bay. *Notornis* **10(4)**: 234.
Hanmer, D.B. (1976). Birds of the lower Zambesi. *Southern Birds* **2**: 1-66.
Hanmer, D.B. (1980). A coastal form of the African Saw-wing (*Pristoptera p. holomelaena*) in S. Malawi. *Nyala* **6**: 134-135.
Hanmer, D.B. (1989). The Nchalo Ringing Station - bird longevity and migrant return. *Nyala* **14**: 21-27.
Hanmer, D.B. (1997). Bird longevity in the eastern highlands of Zimbabwe - drought survivors. *Safring News* **26(2)**: 47-54.
Hanmer, D.B. & Chadder, B. (1993). Birds and the 1991-92 summer drought in the Mutare District. *Honeyguide* **39(2)**: 123-127.
Hansell, M. (2000). *Bird Nests and Construction Behaviour*. Cambridge University Press, Cambridge.
Hanson, A. (1999). More communal roosts of Cape Wagtails. *Bokmakierie* **185**: 20.
Hanssen, O.J. (1984). [Population trends and habitat choice of Woodlark *Lullula arborea* in Norway]. *Vår Fuglefauna* **7(4)**: 188-196.
Harding, D.P. & Harding, R.S.O. (1982). A preliminary checklist of birds in the Kilimi area of northwest Sierra Leone. *Malimbus* **4**: 64-68.
Hardman, J.A. (1974). Biology of the Skylark. *Ann. Appl. Biol.* **76**: 337-341.
Hardy, J.W. (1961). Purple Martins nesting in city buildings. *Wilson Bull.* **73(3)**: 281.
Hario, M. (1997). Kerran kesassa vs. kahdesti kesassa pesivien luotokirvisten tuotannollinen elinika. [Survival prospects of single-brooded and double-brooded Rock Pipits *Anthus petrosus*]. *Ornis Fenn.* **74(2)**: 99-104.
van Harreveld, A.P. (1985). Observations on Razo Lark. *Dutch Birding* **7(3)**: 106-107.
Harris, A., Shirihai, H. & Christie, D. (1996). *The Macmillan Birder's Guide to European and Middle Eastern Birds*. Macmillan, London & Basingstoke.
Harris D., Harris, J. & Harris, C. (1992). Richard's Pipit. *Albatross* **309**: 24.
Harris, G. (1998). *A Guide to the Birds and Mammals of Coastal Patagonia*. Princeton University Press, Princeton, New Jersey.
Harris, M.P. (1973). The Galapagos avifauna. *Condor* **75(3)**: 265-270.
Harris, M.P. (1982). *A Field Guide to the Birds of Galapagos*. Collins, London.
Harris, R.N. (1979). Aggression, superterritories, and reproductive success in Tree Swallows. *Can. J. Zool.* **57**: 2072-2078.
Harris, S.W. (1996). *Northwestern California Birds*. 2nd edition. Humboldt State University Press, Arcata, California.
Harrison, C. (1984). *A Field Guide to the Nests, Eggs and Nestlings of North American Birds*. Collins, London.
Harrison, C.J.O. (1961). Woodlark population and habitat. *London Bird Rep.* **24**: 71-80.
Harrison, C.J.O. (1966). The validity of some genera of larks (Alaudidae). *Ibis* **108(4)**: 573-583.
Harrison, C.J.O. (1982). *An Atlas of the Birds of the Western Palearctic*. Collins, London.
Harrison, C.J.O. (1986). The Saharo-Sindian arid zone birds. *Sandgrouse* **7**: 64-70.
Harrison, C.J.O. & Forster, J. (1959). Woodlark territories. *Bird Study* **6**: 60-68.
Harrison, H.H. (1979). *A Field Guide to Western Birds' Nests*. Houghton Mifflin Company, Boston, Massachusetts.
Harrison, J. (1999). *A Field Guide to the Birds of Sri Lanka*. Oxford University Press, Oxford.
Harrison, J.A. (1999). Nest site choice in the South African Cliff Swallow. *Bird Numbers* **8**: 29-33.
Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J., Parker, V. & Brown, C.J. eds. (1997). *The Atlas of Southern African Birds Including Botswana, Lesotho, Namibia, South Africa, Swaziland and Zimbabwe*. Vol. 2. Passerines. BirdLife South Africa, Johannesburg.
Harrison, J.M. (1962). A record of Dunn's Lark in the Lebanon. *Bull. Brit. Orn. Club* **82(4)**: 75.
Harrowes, D.E. (1936). Nesting of *Oncostoma* in the Canal Zone. *Auk* **53**: 336-337.
Hartert, E. (1910). *Die Vögel der Paläarktischen Fauna*. Vol 1. Friedlander und Sohn, Berlin.
Hartert, E. (1922). Alaudidae und Troglodytidae. Zoologische Ergebnisse der Walter Stötznerschen Expeditionen nach Szetschwan, Osttibet und Tschili auf Grund der Sammlungen und Beobachtungen Dr. Hugo Weigolds. 1. Teil. *Abh. Ber. Zool. Anthr.-Ethn. Mus. Dresden* **15(3)**: 19–22.
Hartert, E. & Venturi, S. (1909). *Notes sur les Oiseaux de la Republique Argentine*. Novitates Zoologicae **16**. 256 pp.
Hartley, G.I. (1917). Nesting habits of the Grey-breasted Martin. Pp. 328-341 in: Beebee, W., Hartley, G.I. & Howles, P.G. eds. (1917). *Tropical Wildlife in British Guiana*. New York Zoological Society, New York.
Hartley, P.H.T. (1941). The sexual displays of swallows. *British Birds* **34**: 256-258.
Hartley, P.H.T. (1946). Notes on the breeding biology of the Crested Lark. *British Birds* **39**: 142-144.
Hartman, C.A. & Oring, L.W. (2003). Orientation and microclimate of Horned Lark nests: the importance of shade. *Condor* **105(1)**: 158-163.
Hartman, M. (1985). Short-tailed Pipit. *Witwatersrand Bird Club News* **130**: 13.
den Hartog, J.C. (1990). Birds of the Cape Verde Islands: notes on species observed (9 August – 10 September 1986), distribution, migration, status, origin and conservation. *Cour. Forschunginst. Senckenb.* **129**: 159-190.
Harvey, W.G. (1980). Identification of Red-rumped Swallow. *British Birds* **73(4)**: 193.
Harwin, R.M., Manson, A.J., Manson, C. & Mwadziwana, P. (1994). The birds of the Bvumba Highlands. *Honeyguide* **40**(Suppl.): 1-51.
Harwood, J. & Harrison, J. (1977). A study of an expanding Sand Martin colony. *Bird Study* **24**: 47-53.
Hasan, M. (2001). *Birds of the Indus*. Oxford University Press, Karachi, Pakistan.
Hasselquist, D., Wasson, M.F. & Winkler, D.W. (2001). Humoral immunocompetence correlates with date of egg-laying and reflects work load in female Tree Swallows. *Behav. Ecol.* **12**: 93-97.
Hasson, O. (1976). [House Martin breeding in Judean Desert]. *Kanaf Renanim* **4**: 5-7. In Hebrew.
Hastwell, K. (1985a). Tree Martins mating in flight. *Austr. Bird Watcher* **11**: 64.
Hastwell, K. (1985b). On the behaviour of Superb Lyrebirds. *Austr. Bird Watcher* **11**: 96.
Haubold, S. (1988). Beitrag zur Kenntnis der Haubenlerche (*Galerida cristata* L.) und ihrer Bestandsentwicklung in Ostwestfalen und in der Stadt Bielefeld. *Ber. Naturwiss. Ver. Bielefeld Umgegend* **29**: 101-119.
Hauri, R. (1968). Die Felsenschwalbe im bernischen Mittelland. *Orn. Beob.* **65**: 192-194.
Hauri, R. (1990). High breeding success of Crag Martins in the canton of Bern, Switzerland, in 1989. *Orn. Beob.* **87(4)**: 351-355.
Hausman, L.A. (1925). On the utterances of the Kingbird, *Tyrannus tyrannus*, Linn., with especial reference to a recently recorded song. *Auk* **42(3)**: 320-326.
Hausman, L.A. (1927). On the winter food of the Tree Swallow (*Iridoprocne bicolor*) and the Myrtle Warbler (*Dendroica coronata*). *Amer. Naturalist* **61**: 379-382.
Haverschmidt, F. (1954). The nesting of the Ridgway Tyrannulet in Surinam. *Condor* **56**: 139-141.
Haverschmidt, F. (1955). Notes on the life history of *Todirostrum maculatum* in Surinam. *Auk* **72(4)**: 325-331.
Haverschmidt, F. (1961). Nests of *Empidonomus varius*, *Pitangus lictor*, and *Myiozetetes cayanensis*. *Auk* **78(2)**: 276-278.
Haverschmidt, F. (1965). Variations in plumage of male and female *Pipra aureola*. *Auk* **82(3)**: 502.
Haverschmidt, F. (1968). *Birds of Surinam*. Oliver & Boyd, Edinburgh & London.
Haverschmidt, F. (1970). Notes on the life history of the Mouse-colored Flycatcher in Surinam. *Condor* **72(3)**: 374-375.
Haverschmidt, F. (1972). Bird records from Surinam. *Bull. Brit. Orn. Club* **92(2)**: 49-53.
Haverschmidt, F. (1973). White-ringed Flycatcher nest-building in old nest of the Yellow-rumped Cacique. *Auk* **90(1)**: 207-208.
Haverschmidt, F. (1978). The duration of parental care in the Common Tody Flycatcher. *Auk* **95(1)**: 199.
Haverschmidt, F. (1982). The status of the Rough-winged Swallow *Stelgidopteryx ruficollis* in Suriname. *Bull. Brit. Orn. Club* **102(2)**: 75-77.
Haverschmidt, F. & Mees, G.F. (1994). *Birds of Suriname*. VACO, Paramaribo.
Hawa, S. (1985). Status report. General information on the bird protection in Peninsular Malaysia. Pp. 52-74 in: Anon. (1985).
Hayes, F.E. (1995). *Status, Distribution and Biogeography of the Birds of Paraguay*. Monographs in Field Ornithology **1**. American Birding Association, Albany, New York. 224 pp.
Hayes, F.E. (1998). An observation of attempted interspecific kleptoparasitism between two Neotropical tyrannid flycatchers. *Orn. Neotropical* **9(1)**: 93-94.
Hayes, F.E. (2000). Intraspecific kleptoparasitism in the Tropical Kingbird (*Tyrannus melancholicus*). *Pitirre* **13(1)**: 7.
Hayes, F.E. (2001). Geographic variation, hybridization, and the leapfrog pattern of evolution in the Suiriri Flycatcher (*Suiriri suiriri*) complex. *Auk* **118(2)**: 457-471.
Hayes, F.E. & Samad, I. (2002). Avifauna of the "Dragon's Teeth": the Bocas Islands, northern Gulf of Paria, between Venezuela and Trinidad. Pp. 62-85 in: Hayes & Temple (2002).
Hayes, F.E. & Temple, S.A. (2002). *Studies in Trinidad and Tobago Ornithology Honouring Richard ffrench*. Department of Life Sciences, University of the West Indies, St. Augustine.
Hayes, F.E., Scharf, P.A. & Ridgely, R.S. (1994). Austral bird migrants in Paraguay. *Condor* **96(1)**: 83-97.
Hayward, C.L., Cottam, C., Woodbury, A.M. & Frost, H.H. (1976). *Birds of Utah*. Brigham Young University Press, Provo, Utah.
Hazevoet, C.J. (1989a). Notes on the behaviour and breeding of the Razo Lark *Alauda razae*. *Bull. Brit. Orn. Club* **109(2)**: 82-86.
Hazevoet, C.J. (1989b). Wing-clapping display of Dupont's Lark *Chersophilus duponti*. *Bull. Brit. Orn. Club* **109(3)**: 181-183.
Hazevoet, C.J. (1995). *The Birds of the Cape Verde Islands. An Annotated Check-list*. BOU Check-list **13**. British Ornithologists' Union, Tring, UK.
Hazevoet, C.J. (1999). Fourth report on birds of Cape Verde Islands, including notes on conservation and records of 11 taxa new to the Archipelago. *Bull. Zoöl. Mus.* **17**: 19-30.
Hazevoet, K., Vlek, R. & Vogelzang, F. (1993). De Woningwet van 1901 en de Kuifleeuwerik *Galerida cristata* als broedvogel in Amsterdam. [The 1901 housing law and the Crested Lark *Galerida cristata* as a breeding bird in Amsterdam]. *Limosa* **66(4)**: 145-152.
Headland, R. (1984). *The Island of South Georgia*. Cambridge University Press.
Heard, C.D.R. & Kirwan, G.M. (1997). Observations of Dunn's Lark *Eremalauda dunni* in the Ramlat al-Sab'atayn, Republic of Yemen. *Sandgrouse* **19(1)**: 8-11.
Heard, C.D.R. & Walbridge, G. (1988). Field identification of Pechora Pipit. *British Birds* **81(9)**: 452-463.
Heath, M.F. (1994). Woodlark *Lullula arborea*. Pp. 364-365 in: Tucker & Heath (1994).
Heath, M.F. & Evans, M.I. eds. (2000). *Important Bird Areas in Europe: Priority Sites for Conservation*. 2 Vols. Northern Europe and Southern Europe. BirdLife Conservation Series **8**. BirdLife International, Cambridge.
Heath, M.F., Borggreve, C. & Peet, N. (2000). *European Bird Populations: Estimates and Trends*. BirdLife Conservation Series **10**. BirdLife International, Cambridge.
Heath, S. (1986). Rock Wrens in the southern Alps of New Zealand. Pp. 277-288 in: Barlow, B.A. ed. (1986). *Flora and Fauna of Alpine Australasia. Ages and Origins*. CSIRO, Melbourne.
Heather, B.D. (1956). Welcome Swallow at Farewell Spit. *Notornis* **6(8)**: 247.
Heather, B.D. & Robertson, H.A. (1997). *The Field Guide to the Birds of New Zealand*. Oxford University Press, Oxford.
Heatwole, H. & Muir, R. (1982). Population densities, biomass and trophic relations of birds in the pre-Saharan steppe of Tunisia. *J. Arid Environm.* **5(2)**: 145-167.
Hebblethwaite, M.L. & Shields, W.M. (1990). Social influences on Barn Swallow foraging in the Adirondacks: a test of competing hypotheses. *Anim. Behav.* **39**: 97-104.
Hedenström, A. (1995). Song flight performance in the Skylark *Alauda arvensis*. *J. Avian Biol.* **26(4)**: 337-342.
Hedenström, A. & Alerstam, T. (1996). Skylark optimal flight speeds for flying nowhere and somewhere. *Behav. Ecol.* **7**: 121-126.
van Heezik, Y. & Seddon, P.J. (1999). Effects of season and habitat on bird abundance and diversity in a steppe desert, northern Saudi Arabia. *J. Arid Environm.* **43(3)**: 301-317.
Hegazi, E.M. (1981). A study of the amount of some invertebrates that are eaten by wild birds in the Egyptian Western Desert. *J. Agric. Sci.* **96(3)**: 497-501.
Heilfurth, F. (1938). Beitrag zur Faunistik, Ökologie und Besie-delungsgeschichte der Vogelwelt der Tres-Marías Inseln (Mexico). Pp. 456-475 in: Jourdain, F.C.R. ed. (1938). *Proceedings of the VIII International Ornithological Congress, Oxford, July 1934*. Oxford University Press, Oxford.
Heim de Balsac, H. (1936). *Biogéographie des Mammifères et des Oiseaux de l'Afrique du Nord*. Bulletin Biologique de France et Belgique. **21**(Supplement). 447 pp.
Heim de Balsac, H. & Mayaud, N. (1962). *Les Oiseaux du Nord-Ouest de l'Afrique*. Éditions Paul Lechevalier, Paris.
Heindl, M. (2002). Social organization on leks of the Wire-tailed Manakin in southern Venezuela. *Condor* **104(4)**: 772-779.
Heindl, M. & Winkler, H. (2002). Interaction of ambient light, lek placement, display behavior, and color signals in two species of *Pipra*. Page 136 in: Anon. (2002a). (Abstract).
Heindl, M. & Winkler, H. (2003a). Vertical lek placement of forest-dwelling manakin species (Aves, Pipridae) is associated with vertical gradients of ambient light. *Biol. J. Linn. Soc.* **80**: 647-658.
Heindl, M. & Winkler, H. (2003b). Interacting effects of ambient light and plumage color patterns in displaying Wire-tailed Manakins (Aves: Pipridae). *Behav. Ecol. Sociobiol.* **53(3)**: 153-162.
Heinonen, S., Gil, F. & Marino, G. (1995). On Birds of Parque Nacional Río Pilcomayo, with addition of *Basileuterus flaveolus* to Argentine avifauna. *Hornero* **14(1-2)**: 69-71.
Heinroth, K. & Steinbacher, J. (1952). *Mitteleuropäische Vogelwelt*. 2 Vols. Kronen-Verlag Erich Cramer, Frankfurt.
Heinzel, H. & Hall, B. (2000). *Galápagos Diary. A Complete Guide to the Archipelago's Birdlife*. Christopher Helm, London.
Hejl, F. (1990). Zur Nidobionomie der Haubenlerche (*Galerida cristata*) auf Dachern der Hochhäuser in Prerov (Mittelmähren). Pp. 41-47 in: Sitko, J. & Trpak, P. eds. (1990). *Pevci 1988: Sbornik z Ornitologicke Konference. [Songbirds 1988: Papers from the Ornithological Conference]*. Statni Zemedelske Nakladatelstvi, Prague.
Hejl, S.J. & Paige, L.C. (1994). A preliminary assessment of birds in continuous and fragmented forests of western redcedar/western hemlock in northern Idaho. Pp. 189–197 in: *Proceedings of the Interior Cedar-Hemlock-White Pine Forests: Ecology and Management*. Department of Natural Resource Sciences, Washington State University, Pullman, Washington.
Hejl, S.J., Hutto, R.L., Preston, C.R. & Finch, D.M. (1995). Effects of silvicultural treatments in the Rocky Mountains. Pp. 220-244 in: Martin & Finch (1995).
Helbig, A.J. (1987). [Field identification of Olive-backed Pipit *Anthus hodgsoni* and its occurrence in Europe]. *Limicola* **1(3)**: 73-85. In German with English summary.
Helbig, A.J., Orth, G., Laske, V. & Wiltschko, W. (1987). Migratory orientation and activity of the Meadow Pipit (*Anthus pratensis*): a comparative observational and experimental field study. *Behaviour* **103(4)**: 276-293. In English with German summary.
Hellebrekers, W.P.J. & Hoogerwerf, A. (1967). *A Further Contribution to Our Oological Knowledge of the Island of Java (Indonesia)*. Zoologische Verhandelingen **88**. Rijksmuseum van Natuurlijke Historie, Leiden. 164 pp.
Hellmayr, C.E. (1906a). *Revision der Spix'schen Typen Brasilianischer Vögel*. Abhandlungen der II. Klasse der Königlichen Bayerischen Akademie der Wissenschaften **22(3)**. 163 pp.
Hellmayr, C.E. (1906b). Critical notes on the types of little-known species of Neotropical birds. *Nov. Zool.* **13(2)**: 305-352.
Hellmayr, C.E. (1910). *The Birds of the Rio Madeira*. Novitates Zoologicae **17(3)**. 172 pp.
Hellmayr, C.E. (1925). Über einen neuen Tyranniden aus Venezuela. *Anz. Orn. Ges. Bayern* **9**: 73-74.
Hellmayr, C.E. (1929). *Catalogue of Birds of the Americas*. Publications of the Field Museum of Natural History (Zoological Series) **13(6)**. 258 pp.
Hellmayr, C.E. (1932). *The Birds of Chile*. Publications of the Field Museum of Natural History (Zoological Series) **308(19)**. 472 pp.
Hellmayr, C.E. (1935). *Catalogue of Birds of the Americas*. Publications of the Field Museum of Natural History (Zoological Series) **13(8)**. 541 pp.
Hellmayr, C.E. & Seilern, J. von (1915). Weitere neue Formen aus Westindien und Venezuela. *Verh. Orn. Ges. Bayern* **12**: 201-205.
Hellyar, R.H. (1927). Notes on the nesting of the Sand Martin. *British Birds* **21**: 166-171.
Hémery, G., Gorin, R. & Renault, O. (1992). Origines géographiques et périodes de migration des alouettes des champs (*Alauda arvensis*) en France d'après les résultats du baguage. [Geographical origins and migration periods of the Skylark (*Alauda arvensis*) in France, according to ringing data]. *Gibier Faune Sauvage* **9**: 229-241. In French with English and German summary.
Henderson, C.L. (2002). *Field Guide to Wildlife of Costa Rica*. University of Texas Press, Texas.
Henderson, I.G., Cooper, J., Fuller, R.J. & Vickery, J. (2000). The relative abundance of birds on set-aside and neighbouring fields in summer. *J. Appl. Ecol.* **37**: 335-347.
Henderson, I.G., Critchley, N.R., Cooper, J. & Fowbert, J.A. (2001). Breeding season responses of Skylarks *Alauda arvensis* to vegetation structure in set-aside (fallow arable land). *Ibis* **143(2)**: 317-321.
Henderson, L.E. (1964). Welcome Swallow in Southland. *Notornis* **11(2)**: 106.
Hendricks, P. (1987a). Foraging patterns of Water Pipits (*Anthus spinoletta*) with nestlings. *Can. J. Zool.* **65(6)**: 1522-1529. In English with French summary.
Hendricks, P. (1987b). Habitat use by nesting Water Pipits (*Anthus spinoletta*): a test of the Snowfield Hypothesis. *Arctic & Alpine Res.* **19(3)**: 313-320.

Hendricks, P. (1991a). Site fidelity and renesting of female American Pipits. *J. Field Orn.* **62(3)**: 338-342.
Hendricks, P. (1991b). Repeatability of size and shape of American Pipit eggs. *Can. J. Zool.* **69(10)**: 2624-2628. In English with French summary.
Hendricks, P. (1997). Geographical trends in clutch size: a range-wide relationship with laying date in American Pipits. *Auk* **114(4)**: 773-778.
Hendricks, P. & Norment, C.J. (1992). Effects of a severe snowstorm on subalpine and alpine populations of nesting American Pipits. *J. Field Orn.* **63(3)**: 331-338.
Hendricks, P. & Norment, C.J. (1994). Hatchability of American Pipit eggs in the Beartooth Mountains, Wyoming. *Wilson Bull.* **106(2)**: 392-399.
Henle, K. (1983). Populationsbiologische und -dynamische Untersuchungen am Wiesenpieper (*Anthus pratensis*) auf der Insel Mellum. [Studies on the population biology and dynamics of the Meadow Pipit (*Anthus pratensis*) on the island Mellum]. *Vogelwarte* **32(1)**: 57-76. In German with English summary.
Henley, J.C. (1974). Australian Tree Martins near Te Araroa. *Notornis* **21(3)**: 266-267.
Hennessey, A.B. (2002). First Bolivian record of Swallow-tailed Cotinga *Phibalura flavirostris* in 98 years. *Cotinga* **17**: 54-55.
Hennessey, A.B. & Gómez, M.I. (2003). Four bird species new to Bolivia: an ornithological survey of the Yungas site Tokoaque, Madidi National Park. *Cotinga* **19**: 25-55.
Hennessey, A.B., Herzog, S.A., Kessler, M. & Robinson, D. (2003). Avifauna of the Pilón Lajas Biosphere and Communal Lands, Bolivia. *Bird Conserv. Int.* **13**: 319-349.
Hennessey, A.B., Herzog, S.K. & Sagot, F. (2003). *Lista Anotada de las Aves de Bolivia*. 5th edition. Asociación Armonía/BirdLife International, Santa Cruz de la Sierra, Bolivia.
Henry, G.M. (1998). *A Guide to the Birds of Sri Lanka*. 3rd edition. Oxford University Press, Delhi.
Henry, P.Y. & Gazave, E. (1998). Attaques répétées d'une Pie-grièche méridionale *Lanius meridionalis elegans* envers un Sirli du désert *Alaemon alaudipes*: compétition ou kleptoparasitisme? *Alauda* **66(3)**: 255-257.
Henshaw, H.W. (1875). Report upon the ornithological collections made in portions of Nevada, Utah, California, Colorado, New Mexico, and Arizona, during the years 1871, 1872, 1873, and 1874. Pp. 131-507 in: Wheeler, G.M. ed. (1875). *Reports upon Geographical and Geological Explorations and Surveys West of 100th Meridian* **5**. Zoology.
Herbert, E.G. (1923). Nests and eggs of birds in central Siam. *J. Siam Soc. (Nat. Hist.)* **6**: 215–222.
Herholdt, J.J. (1986a). South African Cliff Swallows feeding in association with other birds. *Bokmakierie* **38**: 122.
Herholdt, J.J. (1986b). Unusual egg colouration in the Cape Wagtail. *Mirafra* **3**: 25.
Herholdt, J.J. (1989). South African Cliff Swallows in the Kalahari. *Mirafra* **6**: 19.
Herholdt, J.J. & Grobler, N.J. (1987). Field notes on the identification of the Botha's Lark, Pink-billed Lark and Rudd's Lark in the Orange Free State, with notes on their habitat. *Mirafra* **4(3)**: 61-62.
Herholdt, J.J. & Grobler, N.J. (1988). Dimensions of Botha's Lark *Spizocorys fringillaris*. *Ostrich* **59(1)**: 47.
Herklots, G.A.C. (1961). *The Birds of Trinidad and Tobago*. Collins, London.
Herman, E. & Holinsky, R. (1970). [Present state of cytogenetic studies in birds II. Chromosomal evolution]. *Przeglad Zoologiczny* **14**: 159-173.
Hermes, N. (1985). *Birds of Norfolk Island*. Wonderland Publications, Norfolk Island.
Hernández Carrasquilla, F. (1998). Tres holotipos "olvidados" de la colección de aves del Museo Nacional de Ciencias Naturales, Madrid. [Three "overlooked" holotypes from the birds collection of the Museo Nacional de Ciencias Naturales, Madrid]. *Graellsia* **54**: 121-123.
Herranz, J., Manrique, J., Yanes, M. & Suárez, F. (1994). The breeding biology of Dupont's Lark *Chersophilus duponti*, in Europe. *Avocetta* **18(2)**: 141-146.
Herranz, J., Yanes, M. & Suárez, F. (1993). Primeros datos sobre la dieta de pollos de Alondra de Dupont, *Chersophilus duponti*, en la Península Ibérica. *Ardeola* **40(1)**: 77-79.
Herranz, J., Yanes, M. & Suárez, F. (1997). La dieta de pollos de dos aláudidos simpátricos: la Cogujada Montesina y la Terrera Marismeña. Pp. 123-133 in: Manrique, J., Sánchez, A., Suárez, F. & Yanes, M. eds. (1997). *Actas de las XII Jornadas Ornitológicas Españolas*. Instituto de Estudios Almerienses, Almería, Spain.
Herremans, M. (1992). Identification pitfalls in "Yellow" Wagtails in southern Africa. *Babbler* **23**: 36-38.
Herremans, M. (1997). Shortclawed Lark *Certhilauda chuana* clutch from Belfast (Mpumalanga) - a correction. *Ostrich* **68(2-4)**: 121.
Herremans, M. & Herremans, D. (1992). Breeding of the Short-clawed Lark *Mirafra chuana* in Botswana. *Babbler* **23**: 6-17.
Herremans, M., Hunter, N.D. & Allan, D. (1994). The display of the Short-clawed Lark *Certhilauda chuana* and comments on the genus *Certhilauda*. *Bull. Brit. Orn. Club* **114(1)**: 27-31.
Herremans-Tonnoeyr, D. & Herremans, M. (1993). Aerial display of the Spikeheeled Lark *Chersomannes albofasciata*. *Babbler* **25**: 35.
Herrera, C.M. (1984). Significance of ants in the diet of insectivorous birds in southern Spanish Mediterranean habitats. *Ardeola* **30**: 77-81. In English with Spanish summary.
Herrera, L.G., Hobson, K.A., Rodríguez, R. & Hernández, P. (2003). Trophic partitioning in tropical rain forest birds: insights from stable isotope analysis. *Oecologia* **136**: 439-444.
Herrera-Rosales, H.M. (1998). *Características del Hábitat y de su Uso por Dos Especies de Saltarines (Pipridae) en un Humedal del Bosque Lluvioso Neotropical*. MSc thesis, Universidad Nacional, Costa Rica.
Herzog, S.K. (2001). A re-evaluation of Straneck's (1993) data on the taxonomic status of *Serpophaga subcristata* and *S. munda* (Passeriformes: Tyrannidae): conspecifics or semispecies? *Bull. Brit. Orn. Club* **121(4)**: 273-277.
Herzog, S.K., Fjeldså, J., Kessler, M. & Balderrama, J.A. (1999). Ornithological surveys in the Cordillera Cocapata, Depto. Cochabamba, Bolivia, a transition zone between humid and dry intermontane Andean habitats. *Bull. Brit. Orn. Club* **119(3)**: 162-177.
Herzog, S.K., Kessler, M., Maijer, S. & Hohnwald, S. (1997). Distributional notes on birds of Andean dry forests in Bolivia. *Bull. Brit. Orn. Club* **117(3)**: 223-235.
Herzog, S.K., Soria, A.R., Troncoso, J.A. & Matthysen, E. (2002). Composition and structure of avian mixed-species flocks in a high-Andean *Polylepis* forest in Bolivia. *Ecotropica* **8(2)**: 133-143.
Hespenheide, H.A. (1964). Competition and the genus *Tyrannus*. *Wilson Bull.* **76(3)**: 265-281.
Hespenheide, H.A. (1971a). Flycatcher habitat selection in the eastern deciduous forest. *Auk* **88(1)**: 61-74.
Hespenheide, H.A. (1971b). Food preference and the extent of overlap in some insectivorous birds, with special reference to the Tyrannidae. *Ibis* **113(1)**: 59-72.
Hespenheide, H.A. (1975). Selective predation by two swifts and a swallow in Central America. *Ibis* **117(1)**: 82-99.
Hespenheide, H.A. (1980). Bird community structure in two Panama forests: residents, migrants, and seasonality during the nonbreeding season. Pp. 227-237 in: Keast & Morton (1980).
Hester, A. (2000). An applause of Clapper Larks in southern Africa. Unpublished honours project, University of Stellenbosch, Cape Town.
Hewitt, J. (1962). Feeding habit. *Witwatersrand Bird Club News* **42**: 1-5.
Hewitt, J. (1964). Recent records of bird diet and feeding habits. *Witwatersrand Bird Club News* **48**: 1-2.
Hextell, S. (1999). Aves nuevas para España. Alondra Ibis *Alaemon alaudipes*. *Garcilla* **104**: 25.
Heyne, K.H. (1992). Ehemalige Vorkommen der Haubenlerche (*Galerida cristata*) im Trierer Raum. *Dendrocopos* **19**: 26-30.
Hiatt, R.W. (1942). A frequency distribution of Eastern and Western Kingbirds in Montana. *Great Basin Nat.* **3(3&4)**: 109-114.
Hickling, R.A.O. (1983). *Enjoying Ornithology*. T & A.D. Poyser, Calton, UK.
Hickman, G.R. (1979). *Nesting Ecology of Bank Swallows in Interior Alaska*. MSc thesis, University of Alaska, Fairbanks, Alaska.
Hicks, L.E. (1933). Returns of banded Purple Martins. *Bird-Banding* **4**: 113-114.
Higgins, P.J., Peter, J.M. & Steele, W.K. eds. (2001). *Handbook of Australian, New Zealand and Antarctic Birds*. Vol. 5. Tyrant-flycatchers to chats. Oxford University Press, Melbourne.
Higson, P. & Urquhart, E.D. (1990). Crag Martins in Cornwall and East Sussex: new to Britain and Ireland. *British Birds* **83(4)**: 155-159.
Higuchi, H. & Hirano, T. (1981). [Breeding records and breeding habitats of the White Wagtail *Motacilla alba* in Tochigi Prefecture]. *Tori* **29**: 121-128. In Japanese with English summary.
Higuchi, H. & Hirano, T. (1983a). [Aberrant plumages of the Japanese Wagtail *Motacilla grandis*]. *Strix* **2**: 84. In Japanese with English summary.
Higuchi, H. & Hirano, T. (1983b). Comparative ecology of White and Japanese Wagtails *Motacilla alba* and *M. grandis*, in winter. *Tori* **32(1)**: 1-11.
Higuchi, H. & Hirano, T. (1989). Breeding season, courtship behaviour, and territoriality of White and Japanese Wagtails *Motacilla alba* and *M. grandis*. *Ibis* **131(4)**: 578-588.
Higuchi, H. & Nakamura, S. (1983). [Breeding records of White and Japanese Wagtails *Motacilla alba* and *M. grandis* in Japan]. *Strix* **2**: 94. In Japanese with English summary.
Hildén, O. (1987). [The Shore Lark vanishing from Finland]. *Lintumies* **22(2)**: 51-59. In Finnish.
Hildén, O. & Hildén, R. (1995). Berthelot's Pipit *Anthus bertheloti* nesting in early January on Lanzarote. *Ibis* **137(3)**: 422-423.
Hilgert, N. & Benavides, V. (2002). Mosquerito Pechigrís. *Lathrotriccus griseipectus*. Pp. 306-307 in: Granizo (2002).
Hill, J.R. (1988). Nest-depth preference in pipe-nesting Northern Rough-winged Swallows. *J. Field Orn.* **59(4)**: 334-336.
Hill, J.R. (2002). A guide to sexing and aging Purple Martins with some notes on martin rarities in the ABA Area. *Birding* **34(3)**: 246-257.
Hill, L.A. (1992). Observations at a colony of House Martins *Delichon urbica* in south-west Spain, with particular reference to moult. *Ringing & Migration* **13**: 113-116.
Hill, L.A. (1997). Trans-Sahara recoveries of House Martin *Delichon urbica* with discussion on ringing, roosting and sightings in Africa. *Safring News* **26**: 7-12.
Hill, L.A. (2000). Post-breeding and post-juvenile moult of House Martins *Delichon urbica* at colonies in Spain. *Ringing & Migration* **20**: 143-146.
Hill, R.L. & Greeney, H.F. (2000). Ecuadorian birds: nesting records and eggs descriptions from a lowland rainforest. *Avicult. Mag.* **106(2)**: 49-53.
Hill, S.R. & Gates, J.E. (1988). Nesting ecology and microhabitat of the Eastern Phoebe in the central Appalachians. *Amer. Midl. Nat.* **102**: 313–324.
Hillman, J.C. (1993). *Ethiopia: Compendium of Wildlife Conservation Information, 2: Information on Wildlife Conservation Areas*. Wildlife Conservation Society & Ethiopian Wildlife Conservation Organisation, New York & Addis Ababa.
Hilton-Taylor, C. (2000). *IUCN Red List of Threatened Species*. IUCN, Gland, Switzerland & Cambridge, UK.
Hilty, S.L. (1980). Relative abundance of North Temperate Zone breeding migrants in western Colombia and their impact at fruiting trees. Pp. 265-271 in: Keast & Morton (1980).
Hilty, S.L. (1985). Distributional changes in the Colombian avifauna: a preliminary blue list. Pp. 1000-1012 in: Buckley *et al.* (1985).
Hilty, S.L. (1994). A good song and dance: alternative life-styles of manakins and cotingas. Pp. 169-184 in: Hilty, S.L. (1994). *Birds of Tropical America. A Watcher's Introduction to Behavior, Breeding and Diversity*. Chapters Publishing Ltd, Shelburne, Vermont.
Hilty, S.L. (1997). Seasonal distribution of birds at a cloud-forest locality, the Anchicayá Valley, in western Colombia. Pp. 321-343 in: Remsen (1997).
Hilty, S.L. (1999). Three bird species new to Venezuela and notes on the behaviour and distribution of other poorly-known species. *Bull. Brit. Orn. Club* **119(4)**: 220-235.
Hilty, S.L. (2003). *Birds of Venezuela*. Princeton University Press, Princeton, New Jersey.
Hilty, S.L. & Brown, W.L. (1986). *A Guide to the Birds of Colombia*. Princeton University Press, Princeton, New Jersey.
Hindwood, K.A. (1960). Two eggs and second eggs in lyrebirds' nests. *Austr. Bird Watcher* **3**: 94-96.
Hinojosa, M., Martínez, O. & Guerra, J.F. (1998). Acerca de la avifauna del trayecto Pelechuco-Mojos-Apolo, Prov. Franz Tamayo, Dpto. La Paz. Pp. 125-128 in: Sagot & Guerrero (1998). (Panel discussion).
Hirano, T. (1980). [A note on the Japanese Wagtail bigynously bred]. *Yacho* **45**: 356-359. In Japanese.
Hirano, T. (1981). Territory and pair duration of the Japanese Wagtail *Motacilla grandis*. *Tori* **30(1)**: 23-36.
Hirano, T. (1985). [The breeding habitats of three species of wagtail (*Motacilla* spp.) in Utsunomyia]. *Strix* **4**: 1-8. In Japanese with English summary.
Hirano, T. & Higuchi, H. (1986). [Dominance hierarchy among wagtail and pipit species living along streams]. *Jap. J. Orn.* **35(2-3)**: 79-80. In Japanese with English summary.
Hiriart, D., Rojas, M. & Tala, C. (2000). Registros de la llegada temprana del Fío-fío (*Elaenia albiceps chilensis*) a la IV Región. *Bol. Chileno Orn.* **7**: 38-39.
Hirschfeld, E. (1991). Oriental Skylark in Arabia. *Oman Bird News* **10**: 1-3.
Hirschfeld, E. (1995). *Birds in Bahrain. A Study for their Migration Patterns 1990-1992*. Hobby Publications, Dubai, United Arab Emirates.
Hjertaas, D.G. (1984). *Colony Site Selection in Bank Swallows*. MSc thesis, University of Saskatchewan, Saskatoon, Canada.
Hjertaas, D.G., Hjertaas, P. & Maher, W.J. (1988). Colony size and reproductive biology of the Bank Swallow, *Riparia riparia*, in Saskatchewan. *Can. Field-Nat.* **102**: 465-470.
Hoag, D.J. (2000). An instance of helping behavior in Northern Rough-winged Swallows. *Wilson Bull.* **112(2)**: 281-282.
Hobbs, J.N. (1966). Nocturnal feeding by Welcome Swallow. *Emu* **66**: 116.
Hobson, K.A. & Sealy, S.G. (1987). Foraging, scavenging, and other behaviour of swallows on the ground. *Wilson Bull.* **99(1)**: 111-116.
Hockey, P.A.R. (1996). *Birds of Southern Africa. Checklist and Alternative Names*. 2nd edition. Struik Publishers Ltd, Cape Town.
Hockey, P.A.R. (1997a). New birds in Africa. The last 50 years. *Africa. Birds & Birding* **2(1)**: 39-44.
Hockey, P.A.R. (1997b). Yet more birds for Africa. *Africa. Birds & Birding* **2(2)**: 15.
Hockey, P.A.R. & Sinclair, J.C. (1981). The nest and systematic position of Sclater's Lark. *Ostrich* **52(4)**: 256-257.
Hockey, P.A.R., Allan, D.G., Rebelo, A.G. & Dean, W.R.J. (1988). The distribution, habitat requirements and conservation status of Rudd's Lark *Heteromirafra ruddi* in South Africa. *Biol. Conserv.* **45(4)**: 255-266.
Hockey, P.A.R., Underhill, L.G., Neatherway, M. & Ryan, P.G. (1989). *Atlas of the Birds of the Southwestern Cape*. Cape Bird Club, Cape Town.
Hódar, J.A. (1995). Diet of the Thekla Lark, *Galerida theklae*, in a shrubsteppe of southeastern Spain. [Alimentación de la Cojugada Montesina, *Galerida theklae*, en una estepa arbustiva del sureste de España]. *Doñana Acta Vertebrata* **22(1-2)**: 110-114. In English with Spanish summary.
Hodgson, C.J. (1971). *The Birds of the Chimanimani Mountains, Rhodesia*. South African Avifauna Series **77**.
Hoesch, W. (1958). Nest und Gelege der Wüstenlerche *Ammomanes grayi*. *J. Orn.* **99**: 426-430.
Hofer, W. (1983). Ohrenlerche *Eremophila alpestris* bei Hellbuhl/Luzern. *Orn. Beob.* **80(1)**: 83.
Hoffman, H.J. (1951). Nesting behaviour of the Woodlark. *British Birds* **44**: 387.
Hoffmann, B. (1936). Von den Felsenschwalben an der Luegsteinwand. *Verh. Orn. Ges. Bayern* **21**: 65-70.
Hoffmann, R. (1927). *Birds of the Pacific States*. Houghton Mifflin Company, Boston, Massachusetts.
Hoffmann, T.W. (1998). *Threatened Birds of Sri Lanka National Red List*. Ceylon Bird Club, Colombo.
Högstedt, G. (1978). Orientation of the entrance in Tawny Pipit *Anthus campestris* nests. *Ornis Scand.* **9(2)**: 193-196.
Holcomb, L.C. (1972). Traill's Flycatcher breeding biology. *Nebr. Bird Rev.* **40**: 50-68.
Holdaway, R.N. (1988). The New Zealand passerine list: what if Sibley and Ahlquist are right? *Notornis* **35**: 63-70.
Holdaway, R.N. (1999). Introduced predators and avifaunal extinction in New Zealand. Pp. 189-238 in: MacPhee, R.D.E. ed. (1999). *Extinctions in Near Time: Causes, Contexts and Consequences*. Plenum Press, New York.
Holland, G. (1997). Canopy birding: exploring Zululand's forests. *Africa. Birds & Birding* **2(3)**: 52-59.
Hollay, F.G. (1971). Welcome Swallows at Chatham Islands. *Notornis* **18(1)**: 54.
Hollom, P.A.D., Porter, R.F., Christensen, S. & Willis, I. (1988). *Birds of the Middle East and North Africa*. Buteo Books, Vermillion, South Dakota.
Holman, F.C. (1947). Birds of Gold Coast. *Ibis* **89(4)**: 623-650.
Holmes, D.A. & Burton, K. (1987). Recent notes on the avifauna of Kalimantan. *Kukila* **3**: 2-32.
Holmes, G. (1987). *Avifauna of the Big Scrub Country*. New South Wales National Parks & Wildlife Service, Sydney.
Holmes, P.R. (1986). The avifauna of the Suru River Valley, Ladakh. *Forktail* **2**: 21-41.
Holmes, P.R., Christmas, S.E. & Parr, A.J. (1987). A study of the return rate and dispersal of Sand Martins *Riparia riparia* at a single colony. *Bird Study* **34**: 12-19.
Holmes, R.T. & Robinson, S.K. (1981). Tree species preferences of foraging insectivorous birds in a northern hardwoods forest. *Oecologia* **48**: 31-35.
Holmes, R.T. & Sherry, T.W. (1988). Assessing population trends of New Hampshire forest birds: local vs. regional patterns. *Auk* **105(4)**: 756-768.
Holmes, R.T., Sherry, T.W. & Sturges, F.W. (1986). Bird community dynamics in a temperate deciduous forest: long-term trends at Hubbard Brook. *Ecol. Monogr.* **56(3)**: 201-220.
Holroyd, G.L. (1975). Nest site availability as a factor limiting population size of swallows. *Can. Field-Nat.* **89**: 60-64.
Holt, E.G. (1926). On a Guatemalan specimen of *Progne sinaloae* Nelson. *Auk* **43(4)**: 550-551.
Holt, H.R. (1993). *A Birder's Guide to the Texas Coast*. 4th edition. American Birding Association, Colorado Springs, Colorado.
Holt, R.F. & Martin, K. (1997). Landscape modification and patch selection: the demography of two secondary cavity nesters colonizing clearcuts. *Auk* **114(3)**: 443-455.
Holtam, J. (1998). Nesting of the White-tailed Swallow *Hirundo megaensis*. *Scopus* **20**: 58-60.
Holyoak, D.T. (1974). Les oiseaux des Îles de la Société. *Oiseau et RFO* **44**: 153-181.
Holyoak, D.T. & Thibault, J.C. (1984). *Contribution à l'Étude des Oiseaux de Polynésie Orientale*. Mémoires du Muséum National d'Histoire Naturelle Série A, Zoologie **127**. Éditions du Muséum d'Histoire Naturelle, Paris. 209 pp.

Holz, P.H. (1997). Disseminated granulomas caused by protozoan megaloschizonts in Superb Lyrebirds (*Menura novaehollandiae*). *Austr. Vet. J.* **75(9)**: 672-673.
Hoogland, J.L. & Sherman, P.W. (1976). Advantages and disadvantages of Bank Swallow (*Riparia riparia*) coloniality. *Ecol. Monogr.* **46**: 33-58.
Hopcroft, C. (1995). Wagging tails. *Witwatersrand Bird Club News* **170**: 15.
Hordowski, J. (1989). [The first record of a Black Lark in Poland]. *Notatki Orn.* **30(3-4)**: 93-94. In Polish with English summary.
Horn, A.G. (1996). Dawn song repertoires of Tree Swallows (*Tachycineta bicolor*). *Can. J. Zool.* **74**: 1084-1091.
Hornbuckle, J. (1999). The birds of Abra Patricia and the upper Río Mayo, San Martín, north Peru. *Cotinga* **12**: 11-28.
Hornbuckle, J. (2000). Comments on the identification of two species of *Mionectes* flycatchers. *Cotinga* **13**: 82. In English with Spanish summary.
Hornbuckle, J., Mudd, A. & Berg, K. (1997). Survey of the birds of Bilsa Biological Reserve, Ecuador. September 1996. Unpublished report.
Horne, J.F.M. (1987). Vocalisations of the endemic land birds of the Mascarene Islands. Pp. 101-150 in: Diamond (1987).
Horne, J.F.M. & Short, L.L. (1998). A case of "song-capture": Rufous-naped Lark uses nightjar song in place of its own song. *Bull. Brit. Orn. Club* **118(3)**: 153-158.
Horner, R. (1999). Another White-headed Saw-wing south of the Zambezi. *Honeyguide* **45**: 144.
Horváth, L. (1956). A new race of the Short-toed Lark from Hungary. *Bull. Brit. Orn. Club* **76(8)**: 132.
Horwich, R. (1990). *A Belizean Rain Forest: the Community Baboon Sanctuary*. Orang-utan Press, Gays Mills, Wisconsin.
Hosken, J. (1990). Melodious Larks displaying. *Witwatersrand Bird Club News* **150**: 9.
Hosner, P.A. (2004). Unpublished notes of an unusual nest of Yellow-crowned Tyrannulet (*Tyrannulus elatus*). MS.
Hötker, H. (1982a). Studies of Meadow Pipit *Anthus pratensis* dispersal. *Ringing & Migration* **4**: 45-50.
Hötker, H. (1982b). Zum Verhalten junger Wiesenpieper (*Anthus pratensis*) nach der Nestlingszeit. [Studies of the behaviour of young Meadow Pipits (*Anthus pratensis*) after fledging]. *Vogelwelt* **103(1)**: 1-16. In German with English summary.
Hötker, H. (1988). Lifetime reproductive output of male and female Meadow Pipits *Anthus pratensis*. *J. Anim. Ecol.* **57(1)**: 109-117.
Hötker, H. (1989). Meadow Pipit. Pp. 119-133 in: Newton, I. ed. (1989). *Lifetime Reproduction in Birds*. Academic Press, London.
Hötker, H. & Sudfeldt, C. (1978). Drittbruten beim Wiesenpieper (*Anthus pratensis*). [Third broods of the Meadow Pipit (*Anthus pratensis*)]. *Vogelwelt* **99(5)**: 189-190.
Hötker, H. & Sudfeldt, C. (1979a). Diesjährige Wiesenpieper (*Anthus pratensis*) als Helfer am Nest. [First-year Meadow Pipit *Anthus pratensis* as a helper at the nest]. *J. Orn.* **120(3)**: 324-325. In German with English summary.
Hötker, H. & Sudfeldt, C. (1979b). Bigynie beim Wiesenpieper (*Anthus pratensis*). [Bigyny in the Meadow Pipit (*Anthus pratensis*)]. *Vogelwelt* **100(3)**: 112-113.
Hötker, H. & Sudfeldt, C. (1982). Untersuchungen zur Nistplatzwahl einer nordwestdeutschen Population des Wiesenpiepers (*Anthus pratenis*). [Studies of nest site selection in a north-west German population of Meadow Pipit (*Anthus pratenis*)]. *Vogelwelt* **103(5)**: 178-187. In German with English summary.
Hou Lanxin & Jiang Wei (2003). [On the taxonomy of two subspecies of wagtail form Xinjiang]. *Chinese J. Zool.* **38(2)**: 107-109. In Chinese.
Hough, J. (2000). Identification of Cliff Swallow and Cave Swallow. *Birding World* **13(9)**: 368-374.
Houston, A.I., McCleery, R.H. & Davies, N.B. (1985). Territory size, prey renewal and feeding rates: interpretation of observations on the Pied Wagtail (*Motacilla alba*) by simulation. *J. Anim. Ecol.* **54(1)**: 227-239.
Houston, M.I. & Houston, C.S. (1987). Tree Swallow banding near Saskatoon, Saskatchewan. *North Amer. Bird Bander* **12**: 103-108.
Houston, M.I. & Houston, C.S. (1998). Tree Swallow productivity near Saskatoon, Saskatchewan. *North Amer. Bird Bander* **23**: 42-44.
Howard, P. (1957). A Rock Wren's nest on the Mackinnon Pass. *Notornis* **7(5)**: 163-164.
Howe, H.F. (1981). Dispersal of a Neotropical nutmeg (*Virola sebifera*) by birds. *Auk* **98(1)**: 88-98.
Howell, S.N.G. (2002). Additional information on the birds of Ecuador. *Cotinga* **18**: 62-65.
Howell, S.N.G. & Webb, S. (1992). New and noteworthy bird records from Guatemala and Honduras. *Bull. Brit. Orn. Club* **112(1)**: 42-49.
Howell, S.N.G. & Webb, S. (1995a). *A Guide to the Birds of Mexico and Northern Central America*. Oxford University Press, New York.
Howell, S.N.G. & Webb, S. (1995b). Noteworthy bird observations from Chile. *Bull. Brit. Orn. Club* **115(1)**: 57-66.
Howell, S.N.G., Dowell, B.A., James, D.A., Behrstock, R.A. & Robbins, C.S. (1992). New and noteworthy bird records from Belize. *Bull. Brit. Orn. Club* **112(4)**: 235-244.
Howell, T.R. (1957). Birds of a second-growth rain forest area of Nicaragua. *Condor* **59(2)**: 73-111.
Howell, T.R. (1972). Birds of the lowland pine savanna of northeastern Nicaragua. *Condor* **74(3)**: 316-340.
Hoy, G. (1971). Über Brutbiologie und Eier einiger Vögel aus Nordwest-Argentinien II. *J. Orn.* **112**: 158-163.
Hoy, G. (1976). Notas nidobiológicas del noroeste argentino. *Physis (Secc. C)* **35(90)**: 205-209.
Hsu Weishu (1988). Steppe birds and conservation in China. Pp. 221-225 in: Goriup (1988b).
Hua, Z., Minmin, L., Changong, G. & Zhaozhi, Q. (1978). [Some trematodes belonging to the genus *Tanaisia* Skrajabin (family Eucotylidae) from birds in Yunnan, China]. *Acta Zool. Sinica* **24**: 88-90. In Chinese with English summary.
Hubbard, J.P. (1978). *Revised Check-list of the Birds of New Mexico*. New Mexico Ornithological Society Publication **6**. 110 pp.
Hubbard, J.P. (1987). *The Status of the Willow Flycatcher in New Mexico*. New Mexico Department of Game Fish, Endangered Species Program, Santa Fe, Mexico.
Hudon, J., Caparella, A.P. & Brush, A.H. (1989). Plumage pigment differences in manakins of the *Pipra erythrocephala* superspecies. *Auk* **106(1)**: 34-40.
Hudson, W.H. (1920). *Birds of La Plata*. J.M. Dent & Sons, London.
Hüe, F. & Étchécopar, R.D. (1970). *Les Oiseaux du Proche et du Moyen Orient de la Méditerranée aux Contreforts de l'Himalaya*. Éditions N. Boubée, Paris.
Huels, T.R. (1984). First record of Cave Swallows breeding in Arizona. *Amer. Birds* **38**: 281-283.
Huels, T.R. (1985). Cave Swallow paired with Cliff Swallows. *Condor* **87(3)**: 441-442.
Huggett, R. (1995). Update on the Blue Swallow. *Birding in SA* **47**: 117-118.
Hughes, O.R. (1973). Observations on nesting sites of the Welcome Swallow *Hirundo tahitica* on the eastern fringe of Lake Ellesmere, Christchurch. *Mauri Ora* **1**: 61-64.
Huin, N. & Sparks, T.H. (1998). Arrival and progression of the swallow *Hirundo rustica* through Britain. *Bird Study* **45**: 361-370.
Hull, R.L. (1944). Nesting of the Red-throated Rock Martin *Ptyonoprogne r. rufigula*. *J. East Afr. & Uganda Nat. Hist. Soc.* **18**: 94-95.
Hulten, O., Grandin, B., Gustafsson, M. & Jonsson, A. (1989). The Crested Lark *Galerida cristata* in Malmo 1985-1988. *Anser* **28(4)**: 229-234.
Humphrey, J.M. & Garrison, B.A. (1987). *The Status of Bank Swallow Populations on the Sacramento River, 1986*. Wildlife Management Division Contract Final Report. California Department of Fish & Game, Sacramento, California.
Humphrey, P.S., Bridge, D., Reynolds, P.W. & Peterson, R.T. (1970). *Birds of Isla Grande (Tierra del Fuego)*. University of Kansas Museum of Natural History, Lawrence, Kansas.
Hund, K. (1976). Beobachtungen, insbesondere zur Brutsbiologie, an oberschwäbischen Populationen der Mehlschwalbe. *Orn. Mitt.* **28**: 169-178.
Hund, K. & Prinzinger, R. (1979a). Untersuchungen zur Biologie der Mehlschwalbe in Oberschwaben. *Ökol. Vögel* **1**: 133-158.
Hund, K. & Prinzinger, R. (1979b). Untersuchungen zur Ortstreue, Paartreue und Überlebenstrate nestjunger Vögel bei der Mehlschwalbe in Oberschwaben. *Vogelwarte* **30**: 107-117.
Hund, K. & Prinzinger, R. (1985). Die Bedeutung des Lebensalters für brutsbiologische Parameter der Mehlschwalbe. *J. Orn.* **126**: 15-28.
Hunt, G.R. & McLean, I.G. (1993). The ecomorphology of sexual dimorphism in the New Zealand Rifleman *Acanthisitta chloris*. *Emu* **93(2)**: 71-78.
Hunter, A., Cruz, A. & Chace, J.F. (1997). Preferences among American Pipits for different alpine plant communities on Niwot Ridge, Colorado. *J. Colo. Field Orn.* **31(4)**: 217-221.
Hunter, N.D. (1985). Some interesting records from the Mafikeng area. *Babbler* **10**: 37-38.
Hunter, N.D. (1990). An overview of the larks of Botswana. Part 1. *Babbler* **20**: 12-21.
Hunter, N.D. (1991). An overview of the larks of Botswana. Part 2. *Babbler* **21-22**: 62-73.
Hura, P. (1999). Fat and weight of one-year-old individual of *Motacilla flava*. *Ring* **21(1)**: 201.
Hurley, R.J. & Franks, E.C. (1976). Changes in the breeding ranges of two grassland birds. *Auk* **93(1)**: 108-115.
Husmann, K.H. (1981). Rough-winged Swallows nest in building. *South Dakota Bird Notes* **33(3)**: 59.
Hussell, D.J.T. (1981). Migrations of the Least Flycatcher in southern Ontario. *J. Field Orn.* **52**: 97-111.
Hussell, D.J.T. (1982). Longevity and fecundity records in the Tree Swallow. *North Amer. Bird Bander* **7**: 154.
Hussell, D.J.T. (1983a). Tree Swallow pairs raise two broods per season. *Wilson Bull.* **95(3)**: 470-471.
Hussell, D.J.T. (1983b). Age and plumage color in female Tree Swallows. *J. Field Orn.* **54**: 312-318.
Hussell, D.J.T. (1984). Direct Canada-Mexico recovery of a banded Least Flycatcher. *J. Field Orn.* **55(1)**: 116-117.
Hussell, D.J.T. (1988). Supply and demand in Tree Swallow broods: a model of parent-offspring food provisioning interactions in birds. *Amer. Naturalist* **131**: 175-202.
Hussell, D.J.T. (1991a). Spring migrations of Alder and Willow Flycatchers in southern Ontario. *J. Field Orn.* **62**: 69-77.
Hussell, D.J.T. (1991b). Fall migrations of Alder and Willow Flycatchers in southern Ontario. *J. Field Orn.* **62**: 260-270.
Hussell, D.J.T. (2003). Climate change, spring temperatures, and timing of breeding of Tree Swallows (*Tachycineta bicolor*) in southern Ontario. *Auk* **120(3)**: 607-618.
Hussell, D.J.T. & Anderson, S.J. (1999). Longevity record for the Tree Swallow. *North Amer. Bird Bander* **24**: 6-8.
Hussell, D.J.T. & Quinney, T.E. (1987). Food abundance and clutch size of Tree Swallows *Tachycineta bicolor*. *Ibis* **129(2)**: 243-258.
Hussell, D.J.T., Mather, M.H. & Sinclair, P.H. (1992). Trends in numbers of tropical- and temperate-wintering migrant landbirds in migration at Long Point, Ontario, 1961–1988. Pp. 101–114 in: Hagan & Johnston (1992)
Hustings, F., Bekhuis, J., Bijlsma, R.G. & Post, F. (1992). Kuifleeuweriken *Galerida cristata* op hun retour. [Crested Larks *Galerida cristata* declining]. *Vogeljaar* **40**: 145-156.
Hustler, K. (1985). First breeding record of the Shortclawed Lark. *Honeyguide* **31(2)**: 109-110.
Hustler, K. (1993). On the occurrence of the Mountain Pipit (*Anthus hoeschi*) in central Africa. *Arnoldia, Zimbabwe* **9(39)**: 549-555.
Hustler, K. (1997). The status and first breeding record of the Dark Plain-backed Pipit in Zimbabwe. *Honeyguide* **43(1)**: 45-47.
Hustler, K. & Frost, P.G.H. (2002). The biology of the Melodious Lark in Zimbabwe. *Honeyguide* **48(1)**: 28-40.
Hutto, R.L. (1980). Winter habitat distribution of migratory land birds in western Mexico, with special reference to small foliage-gleaning insectivores. Pp. 181-203 in: Keast & Morton (1980).
Hutto, R.L. (1992). Habitat distributions of migratory landbird species in western Mexico. Pp. 221-239 in: Hagan & Johnston (1992).
Hutto, R.L. (1995a). Composition of bird communities following stand-replacement fires in northern Rocky Mountain forests. *Conserv. Biol.* **9**: 1041–1058.
Hutto, R.L. (1995b). *USFS Northern Region Songbird Monitoring Program: Distribution and Habitat Relationships*. Contract Report to USFS Region 1.
Hutton, A.E. (1978). Spatial relationships in perching Barn and Cliff Swallows. *Wilson Bull.* **90(3)**: 396-403.
Iafrancesco, G.M., Mateus, C.L. & Oviedo, G. (1987). Contribución al estudio de los passeriformes rupicolidos y pípridos de Colombia. *Bol. Cient. Univ. La Salle* **3(2)**: 127-156.
Iapichino, C. & Massa, B. (1989). *The Birds of Sicily. An Annotated Check-list*. BOU Check-list **11**. British Ornithologists' Union, Tring, UK.
Igl, L.D. & Johnson, D.H. (1997). Changes in breeding bird populations in North Dakota: 1967 to 1992-93. *Auk* **114(1)**: 74-92.
Ihering, H. von (1900). *Catalogo Critico-comparativo dos Ninhos e Ovos dos Aves do Brasil*. Revista do Museu Paulista **4**. Universidade de São Paulo. São Paulo. 110 pp.
Ihering, H. von (1901). Contribuções para o conhecimiento da ornithologia de São Paulo. II. Descripção de novos ninhos e ovos. *Rev. Mus. Paulista* **5**: 261-329.
Ihering, H. von (1904). The biology of the Tyrannidae with respect to their systematic arrangement. *Auk* **21(3)**: 313-322.
Ilani, G. & Shalmon, B. (1984). Shore Larks in the Lebanon. *Israel Land and Nature* **9(2)**: 81.
Iliff, M. (1998). Bird observations from a visit to Anguilla, Lesser Antilles, 28 December 1995 to 4 January 1996. *Pitirre* **11(1)**: 1-4.
Imamura, K. & Mitsunaga, H. (2004). [The first breeding record of Olive-backed Pipits in Kumamoto Prefecture, western Japan]. *Strix* **22**: 185-187. In Japanese with English summary.
Imberti, S. (2003). Notes on the distribution and natural history of some birds in Santa Cruz and Tierra del Fuego provinces, Patagonia, Argentina. *Cotinga* **19**: 15-24.
Inbar, R. (1982). The Hoopoe Lark. *Israel Land and Nature* **7(3)**: 111-115.
Inskipp, C. & Inskipp, T. (1991). *A Guide to the Birds of Nepal*. 2nd edition. Christopher Helm, London.
Inskipp, C. & Inskipp, T. (1993). Birds recorded during a visit to Bhutan in spring 1993. *Forktail* **9**: 121-143.
Inskipp, C., Inskipp, T. & Grimmett, R. (1999). *Birds of Bhutan*. Christopher Helm, London.
Inskipp, T., Lindsey, N. & Duckworth, W. (1996). *An Annotated Checklist of the Birds of the Oriental Region*. Oriental Bird Club, Sandy, UK.
Irestedt, M., Johansson, U.S., Parsons, T.J. & Ericson, P.G.P. (2001). Phylogeny of major lineages of suboscines (Passeriformes) analysed by nuclear DNA sequence data. *J. Avian Biol.* **32(1)**: 15-25.
Irwin, M.P.S. (1957). Some field notes on a collection of birds from Tanganyika territory. *Ostrich* **28(2)**: 116-122.
Irwin, M.P.S. (1958). A case of geographical overlap in northern Bechuanaland of the *Mirafra apiata* and *Mirafra rufocinnamomea* groups of larks. *Bull. Brit. Orn. Club* **78(5)**: 93-94.
Irwin, M.P.S. (1960). Aspects of relationships between Palearctic and Ethiopian wagtails. *Bull. Brit. Orn. Club* **80(4)**: 61-64.
Irwin, M.P.S. (1977). Variation, geographical arcs and gene flow within the populations of the Rock Martin *Hirundo* (*Ptyonoprogne*) *fuligula* in eastern, southern and southwestern Africa. *Honeyguide* **91**: 11-19.
Irwin, M.P.S. (1978). On the pair-bond in the Tree Pipit *Anthus trivialis* in its winter quarters. *Honeyguide* **96**: 21-22.
Irwin, M.P.S. (1981). *The Birds of Zimbabwe*. Quest, Salisbury.
Irwin, M.P.S. (1982). On the status of the Chestnut-backed Finch Lark in the Middle Zambezi and Luangwa Valleys. *Honeyguide* **111-112**: 20-21.
Irwin, M.P.S. & Lorber, P. (1983). The breeding season of the Chestnut-backed Finch Lark in Zimbabwe. *Honeyguide* **114-115**: 22-24.
Isacch, J.P. & Martínez, M.M. (2001). Estacionalidad y relaciones con la estructura del hábitat de la comunidad de aves de pastizales de paja colorada (*Paspalum quadrifarium*) manejados con fuego en la provincia de Buenos Aires, Argentina. *Orn. Neotropical* **12(4)**: 345-354.
Isacch, J.P., Bo, M.S., Maceira, N.O., Demaria, M.R. & Peluc, S. (2003). Composition and seasonal changes of the bird community in the west pampa grasslands of Argentina. *J. Field Orn.* **74(1)**: 59-65.
Isenmann, P. (2000a). Eine Brut der Felsenschwalbe *Ptyonoprogne rupestris* mit sechs Jungen. *Orn. Beob.* **97**: 55.
Isenmann, P. (2000b). L'adoption de sites artificiels de nidification par l'Hirondelle de rochers *Ptyonoprogne rupestris* SE répand aussi en France. *Alauda* **68(1)**: 27-33.
Isenmann, P. & Moali, A. (2000). *Oiseaux d'Algérie. Birds of Algeria*. Société d'Études Ornithologiques de France, Paris.
Isenmann, P. & Nicolau-Guillaumet, P. (1992). Les observations d'Hirondelles rousselines *Hirundo daurica* en France de 1981 à 1990. *Alauda* **60(1)**: 9-12.
Isfer, O. (2000). Composição da avifauna do Parque Estadual do Rio da Onça, Matinhos, Paraná. Pp. 373-374 in: Straube *et al.* (2000). (Abstract).
Isherwood, I.S., Willis, J.D.A., Edwards, T.R.K., Ekstrom, J.M.M., Kuriake, S., Lubis, I.R., Notanubun, H., Putnarubun, J., Robinson-Dean, J.C. & Tobias, J.A. (1997). *Biological Survey and Conservation Priorities in North-east Seram, Maluku, Indonesia. Final Report of Wae Bula '96*. CSB Conservation Publications, Cambridge.
Ishikawa, N. & Kudo, N. (1998). Artificial walls with entrance holes used by nesting kingfishers and Sand Martins. *Ostrich* **69(3&4)**: 432.
Jackson, F.J. (1905). Notes on the East African species of *Macronyx* and *Tmetothylacus*. *Ibis* **Ser. 8, no. 5**: 101-104.
Jackson, H.D. (1973). Faunal notes from the Chimanimani Mountains based on a collection of birds and mammals from the Miucrera River, Mozambique. *Durban Mus. Novit.* **10**: 23-42.
Jackson, J. & Elgar, M.A. (1993). The foraging behaviour of Willie Wagtail *Rhipidura leucophrys*: why does it wag its tail? *Emu* **93**: 284-286.
Jackson, J.A. (1993). Northern Rough-Winged Swallows excavating at holes among the roots of upturned trees. *Mississippi Kite* **23**: 13-14.
Jackson, J.A. & Schardien, B.J. (1981). Belly-soaking as a possible thermoregulatory mechanism in nesting Purple Martins. *North Amer. Bird Bander* **6(1)**: 12-13.
Jackson, J.A. & Tate, J. (1974). An analysis of nest box use by Purple Martins, House Sparrows, and Starlings in eastern North America. *Wilson Bull.* **86(4)**: 435-449.

Jackson, J.J., Schardien, B.J., Dakin, O.H. & Kulesza, G.C. (1982). Interactions between Purple Martins, *Progne subis*, and Tree Swallows, *Iridoprocne bicolor*, in Quebec. *Can. Field-Nat.* **96**: 355-357.
Jackson, S.W. (1911). Haunts of the Rufous Scrub Bird (*Atrichornis rufescens* Ramsay). *Emu* **10**: 327-336.
Jackson, S.W. (1920). Haunts of the Rufous Scrub Bird (*Atrichornis rufescens*). *Emu* **19**: 258-272.
Jackson, S.W. (1921). Second trip to MacPherson Range, S.W. Queensland (*Atrichornis*). *Emu* **20**: 195-209.
Jácome, M. (2002a). Orejerito de Anteojos. *Pogonotriccus orbitalis*. Page 390 in: Granizo (2002).
Jácome, M. (2002b). Mosquerito Franjinaranja. *Myiophobus lintoni*. Page 393 in: Granizo (2002).
Jácome, M. (2002c). Frutero Pechiescarlata. *Pipreola frontalis*. Page 396 in: Granizo (2002).
Jahn, H. (1942). *Zur Ökologie und Biologie der Vögel Japans*. Journal für Ornithologie **90**. 294 pp.
Jahn, O. & Mena, P. (2002a). Pájaro Paraguas Longuipéndulo. *Cephalopterus penduliger*. Pp. 177-178 in: Granizo (2002).
Jahn, O. & Mena, P. (2002b). Piha Rojiza. *Lipaugus unirufus*. Pp. 316-317 in: Granizo (2002).
Jahn, O. & Mena, P. (2002c). Cotinga Azul. *Cotinga nattererii*. Pp. 318-319 in: Granizo (2002).
Jahn, O. & Mena, P. (2002d). Copetón-Plañidero Rufo. *Rhytipterna holerythra*. Page 394 in: Granizo (2002).
Jahn, O. & Mena, P. (2002e). Siristes Occidental. *Sirystes albogriseus*. Pp. 310-311 in: Granizo (2002).
Jahn, O. & Mena, P. (2002f). Plañidera Moteada. *Laniocera rufescens*. Pp. 314-315 in: Granizo (2002).
Jahn, O. & Mena, P. (2002g). Picoplano del Pacífico. *Rhynchocyclus pacificus*. Page 391 in: Granizo (2002).
Jahn, O. & Mena, P. (2002h). Cotinga Blanca. *Carpodectes hopkei*. Pp. 320-321 in: Granizo (2002).
Jahn, O. & Mena, P. (2002i). Mosquero Aureola. *Conopias albovittata*. Page 395 in: Granizo (2002).
Jahn, O., Vargas, E.E. & Schuchmann, K.L. (1999). The life history of the Long-wattled Umbrellabird *Cephalopterus penduliger* in the Andean foothills of north-west Ecuador: leks, behaviour, ecology and conservation. *Bird Conserv. Int.* **9**: 81-94.
Jakobs, B. (1969). Ueberwinterung von Singdrossel, Wasserpieper und Zwergschnepfe in der Trier Talweitung. *Emberiza* **2(1)**: 3-7.
Jaksic, F.M. & Feinsinger, P. (1991). Bird assemblages in temperate forests of North and South America: a comparison of diversity, dynamics, guild structure, and resource use. *Rev. Chilena Hist. Nat.* **64**: 491-510.
Jamdar, N. (1982). Occurrence of Forest Wagtail (*Motacilla indica gmelini*) in Nagzira Sanctuary, Bhandara District (Maharashtra). *J. Bombay Nat. Hist. Soc.* **79(3)**: 671.
James, D. (1997). *Incidence des Conditions Atmosphériques et du Degré d'Éclairement de la Lune sur les Caractéristiques de la Migration Automnale Nocturne de l'Alouette des champs* (Alauda arvensis) *en France*. MSc thesis. Muséum National d'Histoire Naturelle, Paris.
James, D., Jarry, G. & Érard, C. (2000). Influence of the moon on the nocturnal postnuptial migration of the Skylark *Alauda arvensis* L. in France. *Compt. Rend. Acad. Sci. (Sci. Vice)* **323(2)**: 215-224.
James, H.W. & Brooke, R.K. (1971). Stone-built base of the nest of the Grey-backed Finchlark. *Ostrich* **42**: 226.
James, S. (1994). The Blyth's Pipit story. *Emirates Bird Rep.* **18**: 110-112.
Jansen, J. (2004). Distribution of Dupont's Lark in Morocco. *Dutch Birding* **26(2)**: 116-117.
Janzen, D.H. ed. (1983). *Costa Rican Natural History*. University of Chicago Press, Chicago, Illinois.
Jaramillo, A. (2003). *A Field Guide to the Birds of Chile Including the Antarctic Peninsula, the Falkland Islands and South Georgia*. Christopher Helm, London.
Jarry, G. (1969). Notes sur les oiseaux nicheurs de Tunisie. *Oiseau et RFO* **39(2)**: 112-120.
Jarry, G. (1980). Dynamique d'une population d'Hirondelles rustiques, *Hirundo rustica* L., dans l'est de la région parisienne. *Oiseau et RFO* **50**: 277-294.
Jarry, G. (1987). Caractéristiques de la philopatrie chez l'Hirondelle de cheminée *Hirundo rustica* en Seine-et-Marne. *Alauda* **55**: 295-298.
Jarry, G. (1999). Hirondelle rustique *Hirundo rustica*. Pp. 310-311 in: Rocamora & Yeatman-Berthelot (1999).
Javed, S. & Rahmani, A.R. (1998). Conservation of the avifauna of Dudwa National Park, India. *Forktail* **14**: 55-64.
Jellicoe, M.R. (1954). The Plainbacked Pipit in Sierra Leone. *Nigerian Field* **19(1)**: 31-35.
Jenkins, J.A.F. (1978). Swallows at sea to the north of New Zealand. *Notornis* **25(3)**: 202.
Jennings, M.C. (1980a). *Birds of the Arabian Gulf*. George Allen & Unwin, London.
Jennings, M.C. (1980b). Breeding birds of central Arabia. *Sandgrouse* **1**: 71-81.
Jennings, M.C. (1981). *The Birds of Saudi Arabia: a Check-list*. Published privately, Cambridge, UK.
Jennings, M.C. (1995). *An Interim Atlas of the Breeding Birds of Arabia*. National Commission for Wildlife Conservation and Development & Atlas of the Breeding Birds of Arabia Project, Riyadh.
Jenny, M. (1990a). Nahrungsökologie der Feldlerche *Alauda arvensis* in einer intensiv genutzten Agrarlandschaft des schweizerischen Mittellandes. *Orn. Beob.* **87(1)**: 31-53.
Jenny, M. (1990b). Populationsdynamik der Feldlerche *Alauda arvensis* in einer intensiv genutzten Agrarlandschaft des schweizerischen Mittellandes. *Orn. Beob.* **87(2)**: 153-163.
Jenny, M. (1990c). Territorialität und Brutbiologie der Feldlerche *Alauda arvensis* in einer intensiv genutzten Agrarlandschaft. *J. Orn.* **131(3)**: 241-265.
Jensen, J.V. & Kirkeby, J. (1980). *The Birds of The Gambia. An Annotated Checklist & Guide to the Localities in The Gambia*. Aros Nature Guides, Århus.
Jensen, R. (1962). Birds at modern sewage disposal works. *Ostrich* **33**: 26.
Jensen, R.A.C. & Vernon, C.J. (1970). On the biology of the Didric Cuckoo in southern Africa. *Ostrich* **41(4)**: 237-246.
Jewels, A.M. & Kendall, I. (1992). Woodlarks feeding under cover. *British Birds* **85(7)**: 380.
Jewett, S.G., Taylor, W.P., Shaw, W.T. & Aldrich, J.W. (1953). *Birds of Washington State*. University of Washington Press, Seattle.
Jeyarajasingam, A. & Pearson, A. (1999). *A Field Guide to the Birds of West Malaysia and Singapore*. Oxford University Press, Oxford.
Jiang, W., Zheng, Q., Lin, J.C. & Fan, Y. (1991). The Black Lark (*Melanocorypha yeltoniensis*) found in Xinjiang. *Acta Zootaxonomica Sinica* **16(1)**: 127.
Jiménez, J.E. (2000). Effect of sample size, plot size, and counting time on estimates of avian diversity and abundance in a Chilean rainforest. *J. Field Orn.* **71**: 66-87.
Johansen, H. (1944). Die Vogelfauna Westsibiriens. *J. Orn.* **92**: 157–162.
Johansson, T. & Larsson, T. (2001). Häckfågelfaunan i östra Smålands ytterskärgård 1990-2000. [The breeding birds in the outer archipelago of eastern Småland 1990-2000]. *Ornis Svecica* **11(4)**: 211-222.
Johansson, U.S., Irestedt, M., Parsons, T.J. & Ericson, P.G.P. (2002). Basal phylogeny of the Tyrannoidea based on comparisons of cytochrome *b* and exons of nuclear c-*myc* and RAG-1 genes. *Auk* **119(4)**: 984-995.
John, R.D. (1991). Observations on soil requirements for nesting Bank Swallows, *Riparia riparia*. *Can. Field-Nat.* **105**: 251-254.
Johnsgard, P.A. (1979). *Birds of the Great Plains. Breeding Species and Distribution*. University of Nebraska Press, Lincoln & London.
Johnson, A. (1994). Western Flycatcher at Lake Ahquabi State Park. *Iowa Bird Life* **64**: 6-8.
Johnson, A.W. (1965) *The Birds of Chile and Adjacent Regions of Argentina, Bolivia and Peru*. Vol. 1. Platt Establecimientos Gráficos, Buenos Aires.
Johnson, A.W. (1967). *The Birds of Chile and Adjacent Regions of Argentina, Bolivia and Peru*. Vol. 2. Platt Establecimientos Gráficos, Buenos Aires.
Johnson, A.W. (1972). *Supplement to the Birds of Chile and Adjacent Regions of Argentina, Bolivia and Peru*. Platt Establecimientos Gráficos, Buenos Aires.
Johnson, D.N. ed. (1980). *Proceedings of the IV Pan-African Ornithological Congress, Mahe, Seychelles, 1976*. Southern African Ornithological Society, Johannesburg.
Johnson, D.N. & Maclean, G.L. (1994). Altitudinal migration in Natal. *Ostrich* **65(2)**: 86-94.
Johnson, D.N., Morford, J.S. & Croft, M. (1996). Digging for the Blue Swallow - does it work? Is it ethical? *Lammergeyer* **44**: 46-49.
Johnson, K., Mehlhop, P., Black, C. & Score, K. (1999). Reproductive failure of endangered Southwestern Willow Flycatchers on the Rio Grande, New Mexico. *Southwest. Nat.* **44**: 226-231.
Johnson, N.K. (1963a). Comparative molt cycles in the tyrannid genus *Empidonax*. Pp. 870-883 in: Sibley (1963).
Johnson, N.K. (1963b). *Biosystematics of Sibling Species of Flycatchers in the* Empidonax hammondii-oberholseri-wrightii *Complex*. University of California Publications in Zoology **66**. 159 pp.
Johnson, N.K. (1965). The breeding avifaunas of the Sheep and Spring ranges in southern Nevada. *Condor* **67(2)**: 93-124.
Johnson, N.K. (1970). Fall migration and winter distribution of the Hammond Flycatcher. *Bird-Banding* **41(3)**: 169-190.
Johnson, N.K. (1973). Spring migration of the Western Flycatcher, with notes on seasonal changes in sex and age ratios. *Bird-Banding* **44**: 205–220.
Johnson, N.K. (1980). *Character Variation and Evolution of Sibling Species in the* Empidonax difficilis-flavescens *Complex (Aves: Tyrannidae)*. University of California Publications in Zoology **112**. 151 pp.
Johnson, N.K. (1994). Old-school taxonomy versus modern biosystematics: species-level decisions in *Stelgidopteryx* and *Empidonax*. *Auk* **111(3)**: 773-780.
Johnson, N.K. (2002). Leapfrogging revisited in Andean birds: geographical variation in the Tody-tyrant superspecies *Poecilotriccus ruficeps* and *P. luluae*. *Ibis* **144(1)**: 69-84.
Johnson, N.K. & Jones, R.E. (2001). A new species of Tody-tyrant (Tyrannidae: *Poecilotriccus*) from northern Peru. *Auk* **118(2)**: 334-341.
Johnson, N.K. & Marten, J.A. (1988). Evolutionary genetics of flycatchers. II. Differentiation in the *Empidonax difficilis* complex. *Auk* **105(1)**: 177–191.
Johnston, D.W. (1975). Ecological analysis of the Cayman Island avifauna. *Bull. Florida State Mus. Biol. Sci.* **19(5)**: 235-300.
Johnston, R.F. (1964). *The Breeding Birds of Kansas*. University of Kansas Publications of the Museum of Natural History **12**. Lawrence, Kansas.
Johnston, R.F. (1966). The adaptive basis of geographic variation in color of the Purple Martin. *Condor* **68(3)**: 219-228.
Johnston, R.F. (1967). Seasonal variation in the food of the Purple Martin *Progne subis* in Kansas. *Ibis* **109(1)**: 8-13.
Johnston, R.F. & Hardy, J.W. (1962). Behavior of the Purple Martin. *Wilson Bull.* **74(3)**: 243-262.
Johnstone, R.E. & Jepson, P. (1996). The birds of Roti Island, Nusa Tenggara, Indonesia. *West. Austr. Nat.* **21(1)**: 23-35.
Johnstone, R.E., Jepson, P., Butchart, S.H.M., Lowen, J.C. & Prawiradilaga, D. (1996). The birds of Sumbawa, Moyo and Sangeang Islands, Nusa Tenggara, Indonesia. *Records West. Austr. Mus.* **18**: 157-178.
Jones, G. (1986). Sexual chases in Sand Martins (*Riparia riparia*): cues for males to increase their reproductive success. *Behav. Ecol. Sociobiol.* **19**: 179-185.
Jones, G. (1987a). Body condition changes of Sand Martins (*Riparia riparia*) during breeding, and a comparison with fledgling condition. *J. Zool., London* **213**: 263-281.
Jones, G. (1987b). Colonization patterns in Sand Martins *Riparia riparia*. *Bird Study* **34**: 20-25.
Jones, G. (1987c). Selection against large size in the Sand Martin *Riparia riparia* during a dramatic population crash. *Ibis* **129(2)**: 274-280.
Jones, G. (1987d). Parent-offspring resource allocation in swallows during nestling rearing: an experimental study. *Ardea* **75**: 145-168.
Jones, G. (1987e). Parental foraging ecology and feeding behaviour during nestling rearing in the Swallow. *Ardea* **75**: 169-174.
Jones, G. (1987f). Time and energy constraints during incubation in free-living Swallows (*Hirundo rustica*): an experimental study using precision electronic balances. *J. Anim. Ecol.* **56**: 229-245.
Jones, G. (1988). Concurrent demands of parent and offspring Swallows *Hirundo rustica* in a variable feeding environment. *Ornis Scand.* **19**: 145-152.
Jones, J. (2003). Tree Swallows (*Tachycineta bicolor*): a new model organism? *Auk* **120(3)**: 591-599.
Jones, J.M.B. (1997a). Dusky Lark behaviour at Cornwall Farm, Marondera North. *Honeyguide* **43(2)**: 108.
Jones, J.M.B. (1997b). Sabota Lark at Gache Gache, Kariba. *Honeyguide* **43(4)**: 219-220.
Jones, J.P.G., Ferry, C.D., Isherwood, C.E., Knight, C.G., Kumara, C.L. & Weerakoon, K. (1998). *A Conservation Review of Three Wet Zone Forests in South-west Sri Lanka*. CSB Conservation Publications, Cambridge.
Jones, M. (1965). Bimaculated Lark on Lundy: a bird new to Great Britain and Ireland. *British Birds* **58**: 309-312.
Jones, M.J., Juhaeni, D., Banjaransari, H., Banham, W., Lace, L., Linsley, M.D. & Marsden, S.J. (1994). *The Status, Ecology and Conservation of the Forest Birds and Butterflies of Sumba*. Manchester Metropolitan University, Manchester, UK.
Jones, P.J. & Tye, A. (1988). *A Survey of the Avifauna of São Tomé and Príncipe*. ICBP Study Report **24**, Cambridge.
Jones, R.M. (1991). The status of larks in the Gambia, including first records of Sun Lark *Galerida modesta*. *Malimbus* **13(2)**: 67-73.
Jones, S.R. (1998). Cassin's Kingbird (*Tyrannus vociferans*). Pp. 292-293 in: Kingery, H.E. ed. (1998). *Colorado Breeding Bird Atlas*. Colorado Bird Atlas Partnership and Colorado Division of Wildlife, Denver, Colorado.
Jonkers, D.A. & Leys, H.N. (1994). Monitoring van de Huiszwaluw *Delichon urbica* in 1993 in Nederland. *Vogeljaar* **42**: 159-161. In Dutch with English summary.
Jonsson, L. (1992). *Birds of Europe with North Africa and the Middle East*. Christopher Helm, London.
Jordi, A. & Lustenberger, P. (1998). Ein Spornpieper *Anthus richardi* bei Ins BE. [A Richard's Pipit *Anthus richardi* near Ins, canton of Berne]. *Orn. Beob.* **95(1)**: 61-63. In German with English summary.
Jørgensen, O.H. (1970). Bjergvipstjertens (*Motacilla cinerea*) udbredlse som ynglefugl I Danmark. *Dan. Orn. Foren. Tidssk.* **64**: 70-77.
Jørgensen, O.H. (1971). Iag Hagelser over Bjergvipstjertens (*Motacilla cinerea*) overvintring I Danmark. *Dan. Orn. Foren. Tidssk.* **65**: 26-30.
Jørgensen, O.H. (1976). Migration and aspects of population dynamics in the Grey Wagtail *Motacilla cinerea*. *Ornis. Scand.* **7**: 13-20.
Jørgensen, O.H. (1977). Iagttagelser over Bjergvipstjertens *Motacilla cinerea* Tunst. Ynglebiologi I Danmark. [Observations on the breeding biology of the Grey Wagtail in Denmark]. *Dan. Orn. Foren. Tidsskr.* **71(3-4)**: 121-138. In Danish with English summary.
Joseph, L. (1996). Preliminary climatic overview of migration patterns in South American austral migrant passerines. *Ecotropica* **2(2)**: 185-193. In English with Spanish summary.
Joseph, L. & Stockwell, D. (2000). Temperature-based models of the migration of Swainson's Flycatcher (*Myiarchus swainsoni*) across South America: a new use for museum specimens of migratory birds. *Proc. Acad. Nat. Sci. Philadelphia* **150**: 293-300.
Joseph, L. & Wilke, T. (2004). When DNA throws a spanner in the taxonomic works: testing for monophyly in the Dusky-capped Flycatcher *Myiarchus tuberculifer* and its South American subspecies *M. t. atriceps* Cabanis, 1883. *Emu* **104**.
Joseph, L., Wilke, T. & Alpers, D. (2003). Independent evolution of migration on the South American landscape in a long-distance temperate-tropical migratory bird, Swainson's Flycatcher (*Myiarchus swainsoni*). *J. Biogeogr.* **30**: 925-937.
Joseph, L., Wilke, T., Bermingham, E., Alpers, D. & Ricklefs, R. (2004). Towards a phylogenetic framework for the evolution of shakes, rattles and rolls in *Myiarchus* tyrant-flycatchers (Aves: Passeriformes: Tyrannidae). *Mol. Phylogen. Evol.* **31**: 139-152.
Jourdain, F.C.R. & Shuel, R. (1935). Notes on a collection of eggs and breeding habits of birds near Lokoja, Nigeria. *Ibis* **Ser. 13, no. 5**: 623-663.
de Juana, E. (1980). *Atlas Ornitológico de La Rioja*. Instituto de Estudios Riojanos, Consejo Superior de Investigaciones Científicas, Logroño.
de Juana, E. (2003). Comité de Rarezas de la Sociedad Española de Ornitología. Observaciones de aves raras en España. 2001. *Ardeola* **50(1)**: 123-149.
de Juana, E. & Suárez, F. (2003). Terrera Común *Calandrella brachydactyla*. Pp. 368-369 in: Martí & del Moral (2003).
de Juana, E., Martín, C., Naveso, M.A., Pain, D. & Sears, J. (1993). Farming and birds in Spain: threats and opportunities for conservation. *RSPB Conserv. Rev.* **7**: 67-73.
de Juana, E., Santos, T., Suárez, F. & Tellería, J.L. (1988). Status and conservation of steppe birds and their habitats in Spain. Pp. 113-123 in: Goriup (1988b).
Juergens, R. (2002). Zur Lebensweise des Kanarenpiepers auf La Palma. *Orn. Mitt.* **54(9)**: 320-321.
Kale, H.W. (1968). The relationship of Purple Martins to mosquito control. *Auk* **85(4)**: 654-661.
Kale, H.W., Hundley, M.H. & Tucker, J.A. (1969). Tower-killed specimens and observations of migrant birds from Grand Bahama Island. *Wilson Bull.* **81(3)**: 258-263.
Kalejta, B. (1997). Diet and habitat preferences of wintering passerines on the Tafft/Ely saltmarshes [Wales]. *Bird Study* **44**: 367-373.
Kälin, H. (1991). [Crag Martin *Ptyonoprogne rupestris* breeding near Baar ZG, Switzerland]. *Orn. Beob.* **88**: 338. In German.
Kalsi, R.S. (1998). Birds of Kalesar Wildlife Sanctuary, Haryana, India. *Forktail* **13**: 29-32.
Kaminski, P., Choinski, A. & Wotosiuk, B. (1993). Dynamics of the content of selected elements in the nestling development of the House Martin *Delichon urbica*. *Acta Orn., Warszawa* **28**: 23-37.
Kaminski, P., Wotosiuk, B. & Choinski, A. (1993). Growth, chemical composition and energetic value of nestlings of the House Martin *Delichon urbica*. *Acta Orn., Warszawa* **28**: 11-22.
Kanai, I. (1960). Breeding ecology of the House Swallow (*Hirundo rustica*). *Misc. Rep. Yamashina Inst. Orn.* **2**: 30-40.
Kanai, I. (1961). An oological note on *Hirundo rustica*. *Misc. Rep. Yamashina Inst. Orn.* **3**: 113-122.
Kanai, I. (1964). Measurement analysis of swallow's nest. *Misc. Rep. Yamashina Inst. Orn.* **4**: 31-41.
Kang, K.W. (1971). Foreign recoveries of House Swallows banded in eastern Asian countries. *Ostrich* **42**: 179-189.
Kanouchi, T., Abe, N. & Ueda, H. (1998). *Wild Birds of Japan*. Yama-Kei Publishers, Tokyo.
Kanowski, S. (1982). Bachstelze (*Motacilla alba*) füttert 2 flügge Kuckucke (*Cuculus canorus*). *Vogelwelt* **103(1)**: 34.
Kaplan, G. & Sridhara, S. (1999). Song structure and function of mimicry in the Australian Magpie (*Gymnorhina tibicen*) and the lyrebird (*Menura*). *Adv. Ethol.* **34**: 22. (Abstract).

Karcher, F. & Medland, R.D. (1989). Preferred habitat of Fischer's Finchlark. *Nyala* **14(1)**: 41.

Karhe, H. (1966). Västäräkki (*Motacilla alba*) yritti paritella kuolleen hemekertun (*Sylvia curruca*) kanssa. [A White Wagtail (*Motacilla alba*) attempting to copulate with a dead Lesser Whitethroat (*Sylvia curruca*)]. *Ornis Fenn.* **43**: 79.

Karlsson, J. & Kjellen, N. (1988). Skylark *Alauda arvensis* L. *Vår Fågelvärld* **12**(Suppl.): 245-254.

Karnas, A. (1986). [The first record of Short-toed Lark in Poland]. *Notatki Orn.* **26(3-4)**: 221-223. In Polish with English summary.

Karnas, A. & Skakuj, M. (1988). [Pechora Pipit - the new species in avifauna of Poland]. *Not. Orn.* **29(3-4)**: 200-206. In Polish with English summary.

Karr, J. (1971). Structure of avian communities in selected Panama and Illinois habitats. *Ecol. Monogr.* **41**: 207-233.

Karr, J.R. & Freemark, K.E. (1983). Habitat selection and environmental gradient dynamics in the stable tropics. *Ecology* **64**: 1481-1494.

Karr, J.R., Robinson, S.K., Blake, J.G. & Bierregaard, R.O. (1990). Birds of four Neotropical forests. Pp. 237-269 in: Gentry, A.H. ed. (1990). *Four Neotropical Forests*. Yale University, New Haven, Connecticut.

Karubian, J., Castañeda, G., Freile, J.F., Salazar, R.T., Santander, T. & Smith, T.B. (2003). Nesting biology of a female Long-wattled Umbrellabird *Cephalopterus penduliger* in north-western Ecuador. *Bird Conserv. Int.* **13(4)**: 351-360.

Kasumovic, M.M., Ratcliffe, L.M. & Boag, P.T. (2003). Song structure may differ between male and female Least Flycatchers. *Wilson Bull.* **115(3)**: 241-245.

Kasybekov, E.S. & Kurmankulov, A.B. (1994). Occurrence of Spanish Sparrow, *Passer hispaniolensis* and Crested Lark, *Galerida cristata* above 3100 m in winter. *Folia Zoologica* **43(1)**: 91-92.

Kattan, G.H., Álvarez-López, H., Gómez, N. & Cruz, L. (2000). Notes on the nesting biology of the Apical Flycatcher, a Colombian endemic. [Notas sobre la biología reproductiva de *Myiarchus apicalis*, una especie endémica de Colombia]. *J. Field Orn.* **71(4)**: 612-618.

Kaufman, K. (1990). *Field Guide to Advanced Birding: Birding Challenges & How to Approach Them*. Houghton Mifflin Company, Boston & New York.

Kaufman, K. (1996). *Lives of North American Birds*. Houghton Mifflin Company, Boston & New York.

Kaufman, K. (1997). Least Flycatcher. *Birder's World* **11(3)**: 76-77.

Kaufman, K. (1998). Field identification: American Pipit. *Birder's World* **12(6)**: 82-83.

Kazmierczak, K. (2000). *A Field Guide to the Birds of the Indian Subcontinent*. Pica Press, Nr. Robertsbridge, UK.

Keast, A. (1972). Faunal elements and evolutionary patterns: some comparisons between the continental avifaunas of Africa, South America, and Australia. Pp. 594-622 in: Voous (1972).

Keast, A. (1985). Tropical rainforest avifaunas: an introductory conspectus. Pp. 3-31 in: Diamond & Lovejoy (1985).

Keast, A. & Morton, E.S. eds. (1980). *Migrant Birds in the Neotropics: Ecology, Behavior, Distribution, and Conservation*. Smithsonian Institution Press, Washington, D.C.

Keith, A.R. (1970). Bird observations from Tierra del Fuego. *Condor* **72(3)**: 361-363.

Keith, A.R. (1997). *The Birds of St. Lucia, West Indies. An Annotated Check-list*. BOU Check-list **15**. British Ornithologists' Union, Tring, UK.

Keith, A.R., Wiley, J.W., Latta, S.C. & Ottenwalder, J.A. (2003). *The Birds of Hispaniola. Haiti and the Dominican Republic*. BOU Check-list **21**. British Ornithologists' Union, Tring, UK.

Keith, S., Urban, E.K. & Fry, C.H. (1992). *The Birds of Africa*. Vol. 4. Academic Press, London & San Diego.

Kellner, C.J. & Ritchison, G. (1988). Possible functions of singing by female Acadian Flycatchers (*Empidonax virescens*). *J. Field Orn.* **59**: 55–59.

Kelsey, M.G. & Langton, T.E.S. (1984). *The Conservation of the Arabuko-Sokoke Forest, Kenya*. ICBP Study Report **4**. ICBP & University of East Anglia, Norwich, UK.

Kemp, A.C., Herholdt, J.J., Whyte, I. & Harrison, J.A. (2001). Birds of the two largest national parks in South Africa: a method to generate estimates of population size for all species and assess their conservation ecology. *S. Afr. J. Sci.* **97**: 393-403.

Kempenaers, B., Congdon, B., Boag, P. & Robertson, R.J. (1999). Extrapair paternity and egg hatchability in Tree Swallows: evidence for the genetic compatibility hypothesis? *Behav. Ecol.* **10**: 304-311.

Kempenaers, B., Everding, S., Bishop, C., Boag, P. & Robertson, R.J. (2001). Extra-pair paternity and the reproductive role of male floaters in the Tree Swallow (*Tachycineta bicolor*). *Behav. Ecol. Sociobiol.* **49**: 251-259.

Kempenaers, B., Lanctot, R.B. & Robertson, R.J. (1998). Certainty of paternity and paternal investment in Eastern Bluebirds and Tree Swallows. *Anim. Behav.* **55**: 845-860.

Kendall, A. & Kuehler, C. (1989). Artificial incubation and hand-rearing of Andean Cock of the Rock (*Rupicola peruviana*). *Aviicult. Mag.* **95(4)**: 153-158.

Kendeigh, S.C. (1952). *Parental Care and its Evolution in Birds*. Illinois Biological Monograph **22**. University of Illinois Press, Illinois. 358 pp.

Kennedy, R.S., Gonzales, P.C., Dickinson, E.C., Miranda, H.C. & Fisher, T.H. (2000). *A Guide to the Birds of the Philippines*. Oxford University Press, Oxford & New York.

Kent, A.M., Webber, T. & Steadman, D.W. (1999). Distribution, relative abundance, and prehistory of birds on the Taraco Peninsula, Bolivian altiplano. *Orn. Neotropical* **10(2)**: 151-178.

Kenyon, R.F. (1972). Polygyny among Superb Lyrebirds in Sherbrooke Forest Park, Kallista, Victoria. *Emu* **72(2)**: 70-76.

Kerautret, L. (1979). Note sur le Cochevis huppé (*Galerida cristata*) dans le Nord - Pas-de-Calais. *Heron* **4**: 37-47.

Kéry, M. (1991). Brutbestand und Verbreitung der Felsenschwalbe *Ptyonoprogne rupestris* in Schweizer Jura in den achtziger Jahren. [Population size and distribution of Crag Martins *Ptyonoprogne rupestris* in the Swiss Jura in the eighties]. *Orn. Beob.* **88**: 209-216. In German with French and English summaries.

Kessel, B. & Gibson, D.D. (1978). *Status and Distribution of Alaska Birds*. Studies in Avian Biology **1**.

Kessler, M. & Herzog, S.K. (1998). Conservation status in Bolivia of timberline habitats, elfin forest and their birds. *Cotinga* **10**: 50-54.

Keve, A. (1978). Die Arealausbreitung der Maskenstelze *Motacilla (flava) feldegg*. [Areal expansion of the Black-headed Wagtail *Motacilla (flava) feldegg*]. *Anz. Orn. Ges. Bayern* **17(3)**: 225-237. In German with English summary.

Khachar, S. (1989). Forest Wagtail, *Motacilla indica* at Jasdan, Gujarat. *J. Bombay Nat. Hist. Soc.* **86(3)**: 453.

Khan, M.A.R. (1988). The grassland avifauna of Bangladesh. Pp. 215-219 in: Goriup (1988b).

Kieckbusch, J.J. & Romahn, K.S. (2000). Breeding population, population development and breeding habitats of Woodlark (*Lullula arborea*) and nightjar (*Caprimulgus europaeus*) in Schleswig-Holstein. *Corax* **18(2)**: 142-159.

Kiff, L.F. & Hough, D.J. (1985). *Inventory of Bird Egg Collections in North America, 1985*. American Ornithologists' Union & Oklahoma Biological Survey, Norman, Oklahoma.

Kiff, L.F., Marin, M., Sibley, F.C., Matheus J.C. & Schmitt, N.J. (1989). Notes on the nests and eggs of some Ecuadorian birds. *Bull. Brit. Orn. Club* **109(1)**: 25-31.

Kiis, A. (1985). Winter distribution of Crested Larks *Galerida cristata* in Frederikshavn. *Dan. Orn. Foren. Tidssk.* **79(1-2)**: 59-60.

Kilgore, D.L. & Knudsen, K.L. (1977). Analysis of materials in Cliff and Barn Swallow nests: relationship between mud selection and nest architecture. *Wilson Bull.* **89(4)**: 562-571.

Kilham, L. (1980). Assemblages of Tree Swallows, *Iridoprocne bicolor*, as information centers. *Florida Field Nat.* **8**: 26-28.

King, B. (1981). The field identification of North American Pipits. *Amer. Birds* **35(5)**: 778-788.

King, B.F. (1997). *Checklist of the Birds of Eurasia*. Ibis Publishing Co., Vista, California.

King, B.F. & Kanwanich, S. (1978). First wild sighting of the White-eyed River Martin *Pseudochelidon sirintarae*. *Biol. Conserv.* **13(3)**: 183-185.

King, B.F., Woodcock, M. & Dickinson, E.C. (1975). *A Field Guide to the Birds of South-east Asia*. Collins, London.

King, J. (1997). OrnithoNews. A new African Pipit. *Birding World* **10(2)**: 42.

King, J.R. (1955). Notes on the life history of Traill's Flycatcher (*Empidonax traillii*) in southeastern Washington. *Auk* **72(2)**: 148-173.

King, W.B. ed. (1978/79). *Endangered Birds of the World. The ICBP Bird Red Data Book*. Vol. 2. Aves. 2nd edition. IUCN, Morges, Switzerland.

Kingery, H.E. & Kingery, U.C. (1995). Gopher snake as predator at Long-billed Curlew and Rough-winged Swallow nests. *J. Colo. Field Orn.* **29(1)**: 18-19.

Kinsky, F.C. convener (1970). *Annotated Checklist of the Birds of New Zealand Including the Birds of the Ross Dependency*. A.H. & A.W. Reed, Wellington.

Kirchman, J.J. (1998). Population genetics and phylogeny of the Cave Swallow species complex. Page 135 in: Anon (1998b). (Abstract).

Kirchman, J.J., Whittingham, L.A. & Sheldon, F.H. (2000). Relationships among Cave Swallow populations (*Petrochelidon fulva*) determined by comparisons of microsatellite and cytochrome b data. *Mol. Phylogen. Evol.* **14**: 107-121.

de Kiriline, L. (1948). Least Flycatcher. *Audubon Bull.* **50**: 149-153.

Kirkconnell, A., Llanes, A. & Quiñones, R. (1993). Datos preliminares sobre la ecología reproductiva de la Golondrina de Cuevas (*Hirundo fulva*) en Cuba. *Pitirre* **6(3)**: 8.

Kirkpatrick, K.M. (1954a). A display of the Redwinged Bush-lark (*Mirafra erythroptera* Blyth). *J. Bombay Nat. Hist. Soc.* **52(2-3)**: 601-602.

Kirkpatrick, K.M. (1954b). The courtship display of the Large Pied Wagtail (*Motacilla maderaspatensis* Gmelin). *J. Bombay Nat. Hist. Soc.* **52**: 602-603.

Kirschke, S. (1994). Haltung und Zucht von Haubenlerchen. *Gefiederte Welt* **118(7)**: 228-230.

Kirwan, G.M. (1996). Neotropical notebook. Bolivia. *Cotinga* **6**: 35.

Kirwan, G.M. (1997). Around the region. *Sandgrouse* **19(2)**: 159.

Kirwan, G.M. & Hornbuckle, J. (1997a). Neotropical Notebook. Panama. *Cotinga* **7**: 76.

Kirwan, G.M. & Hornbuckle, J. (1997b). Neotropical Notebook. Brazil. *Cotinga* **7**: 77.

Kirwan, G.M. & Hornbuckle, J. (1997c). Neotropical Notebook. Peru. *Cotinga* **7**: 80.

Kirwan, G.M. & Kirkconnell, A. (2000). Leucism in Crescent-eyed Pewee (*Contopus caribaeus*) in western Cuba. *Pitirre* **13(3)**: 88.

Kirwan, G.M. & Sharpe, C.J. (1999). Range extensions and notes on the status of little-known species from Venezuela. *Bull. Brit. Orn. Club* **119(1)**: 38-47.

Kirwan, G.M., Mazar Barnett, J., Ferreira de Vasconcelos, M., Raposo, M.A., Neto, S.D. & Roesler, I. (2004). Further comments on the avifauna of the middle São Francisco Valley, Minas Gerais, Brazil. *Bull. Brit. Orn. Club* **124**.

Kirwan, G.M., Mazar Barnett, J. & Minns, J. (2001). Significant ornithological observations from the Rio São Francisco Valley, Minas Gerais, Brazil, with notes on conservation and biogeography. *Ararajuba* **9**: 145-161.

Kittenberger, K. (1959). My ornithological collecting expeditions in East Africa. II. *Aquila* **66**: 53-87.

Kjellen, N. (1991). [A Lesser Short-toed Lark in Falsterbo 27-28 April 1986]. *Vår Fågelvärld* **50(1)**: 52-53.

Klaas, E.E. (1968). Summer birds from the Yucatan Peninsula, Mexico. *Univ. Kansas Publ. Mus. Nat. Hist.* **17(14)**: 579-611.

Klaas, E.E. (1970). *A Population Study of the Eastern Phoebe and its Social Relationships with the Brown-headed Cowbird*. PhD dissertation. University of Kansas, Lawrence, Kansas.

Klapste, I. & Klapste, P. (1985). Dusting, sunning and albinism in Welcome Swallows *Hirundo neoxena*. *Austr. Bird Watcher* **11(3)**: 98-99.

Klebauskas, G. & Pacheco, A. (2000). The nest of the Snowy Cotinga *Carpodectes nitidus* in Costa Rica. *Cotinga* **14**: 102.

Kleene, R. & Michaelis, H. (1987). Beobachtungen zur Nahrungsaufnahme der Haubenlerche (*Galerida cristata*) auf einem Schulplatz in Mettingen (Kreis Steinfurt). *Nat. Heimat* **47(4)**: 135-138.

Kleynhans, D.H. (1996). Vokale nabootsing deur'n rooikoplewerik *Calandrella cinerea*. [Vocal imitation by a Redcapped Lark *Calandrella cinerea*]. *Mirafra* **13(3-4)**: 61-63.

Kleynhans, H. & Kleynhans, J. (2000). Possible Fiscal Shrike predation of Spike-heeled Lark. *Mirafra* **17(3)**: 43.

Klimaitis, J.F. (1984). Nota sobre un nido de la Mosqueta Vientre Amarillo (*Phylloscartes ventralis*) en Punta Lara, Ensenada, Buenos Aires, Argentina. *Hornero* **12**: 203-204.

Klimaitis, J.F. & Moschione, F.N. (1987). *Aves de la Reserva Integral de Selva Marginal de Punta Lara y sus Alrededores*. Dirección de Servicios Generales del Ministerio, Argentina.

Klimkiewicz, M.C. & Futcher, A.G. (1989). Longevity records of North American birds. Suppl. 1. *J. Field Orn.* **60**: 469-494.

Klingenberg, C. (1982). Sommerbestand der Heidelerche *Lullula arborea* auf dem Schaffhauser Randen. *Orn. Beob.* **79(1)**: 68-69.

Kloot, T. (1993). A "flick-flutter" of Bush Larks *Mirafra javanica*. *Vorg Notes* **28(1-2)**: 26-28

Knapton, B.E. (2002). A new bird for Chile: the Rufous-webbed Tyrant *Polioxolmis rufipennis*, potentially breeding within the province of Parinacota, Tarapacá region. *Bol. Chileno Orn.* **9**: 37-41.

Knaus, P. & Balzari, C.A. (1999). Seltene Vogelarten und ungewöhnliche Vogelbeobachtungen in der Schweiz im Jahre 1998. [Rare and unusual bird observations in Switzerland in 1998]. *Orn. Beob.* **96(3)**: 157-182.

Knight, O.W. (1908). *The Birds of Maine*. C.H. Glass, Bangor, Maine.

Knight, R.L. (1995). First Tennessee record of Violet-green Swallow with a summary of extralimital records in eastern North America. *Migrant* **66**: 46-48.

Knox, A.G. (1988). Taxonomy of the Rock/Water Pipit superspecies *Anthus petrosus, spinoletta* and *rubescens*. *British Birds* **81(5)**: 206-211.

Knox, A.G. & Walters, M.P. (1994). *Extinct and Endangered Birds in the Collections of the Natural History Museum*. British Ornithologists' Club Occasional Publications **1**. 292 pp.

Knystautas, A. (1987). *The Natural History of the USSR*. Century, London.

Knystautas, A. (1993). *Birds of Russia*. Harper Collins Publishers, London.

Koelz, W. (1939). New birds from Asia, chiefly from India. *Proc. Biol. Soc. Washington* **52**: 75-76.

Koenen, M.T. & Koenen, S.G. (2000). Effects of fire on birds in Paramo habitat of northern Ecuador. *Orn. Neotropical* **11(2)**: 155-163.

Koenig, P. (1996). [Body mass in postnuptial migrating Skylark (*Alauda arvensis*)]. *Schoeniclus* **2**: 37-42. In French.

Koenig, P. (2002). Un cas d'altruisme fraternel chez la Bergeronnette de Madagascar *Motacilla flaviventris*. *Alauda* **70(4)**: 443-444.

Koepcke, M. (1954). *Zaratornis stresemanni* nov. gen. nov. spec., un cotíngido nuevo del Perú. *Publ. Mus. Hist. Nat. Javier Prado (Ser. A, Zool.)* **16**: 1-8.

Koepcke, M. (1955). *Zaratornis stresemanni* ein neuer Cotingide aus Peru. Pp. 329-332 in: Thomson (1955).

Koepcke, M. (1961). Birds of the western slope of the Andes of Peru. *Amer. Mus. Novit.* **2028**: 1-31.

Koepcke, M. (1963). Anpassungen und geographische Isolation bei Vögeln der peruanischen Küstenlomas. [Adaptations and geographical isolation of the birds of the Peruvian coastal lomas]. Pp. 1195-1213 in: Sibley (1963). In German with English summary.

Koepcke, M. (1970). *The Birds of the Department of Lima, Peru*. Livingston Publishing Company, Wynnewood, Pennsylvania.

Koffán, K. (1960). [Observations on the nesting of the Woodlark (*Lullula arborea* L.)]. *Acta Zool. Acad. Sci. Hung.* **6**: 371-412. In Hungarian.

Kok, J.D.S. (1996). Birds of the Free State National Botanical Garden. *Mirafra* **13(3/4)**: 55-61.

Kolbe, H. (1963). Verbreitung der Gebirgsstelze auf der südlichen Flamingsbilachung. *Vogelwelt* **84**: 84-90.

Koller, J. (1980). Nisthilfe für Wasseramsel *Cinclus cinclus* und Gebirgsstelze *Motacilla cinerea*. *Anzeiger* **19(3)**: 193-195.

Komar, O. (1997). Communal roosting behavior of the Cave Swallow in El Salvador. *Wilson Bull.* **109(2)**: 332-337.

Komar, O. (2002). Birds of Montecristo National Park, El Salvador. *Orn. Neotropical* **13(2)**: 167-193.

Komar, O. & Domínguez, J.P. (2001). *Lista de Aves de El Salvador*. SalvaNATURA, San Salvador.

Kondélka, D. (1978). The breeding biology of the House Martin. *Folia Zoologica* **27**: 37-45.

Kondélka, D. (1985). Clutch size and losses during breeding in the Swallow (*Hirundo rustica*) in the northern Moravian region (CSSR). *Folia Zoologicu* **34**: 149-158.

Konigsstedt, D. & Robel, D. (1985). Zur feldornithologischen Unterscheidung von Stummellerche (*Calandrella rufescens*) und Kurzzehenlerche (*C. cinerea*) (Aves, Passeriformes, Alaudidae). *Zool. Abh. Staatl. Mus. Tierk. Dresden* **41(5)**: 65-75.

Königstedt, D. & Muller, H.E.J. (1983). Zur Unterscheidung von Bergpieper (*Anthus spinoletta spinoletta*) und Felsenpieper (*Anthus sp. littoralis*). [On separating Water Pipit *Anthus spinoletta spinoletta* from *Anthus sp. littoralis*]. *Beitr. Vogelkd.* **29(2)**: 77-88. In German with English summary.

Koning, F.J. (1982). Over Fenologie en Biometrie van Oever- en Waterpieper *Anthus spinoletta*. [On phenology and biometry of Rock and Water Pipit *Anthus spinoletta*]. *Limosa* **55(4)**: 115-120. In Dutch with English summary.

Kopij, G. (1997). Quantitative studies of selected bird species in the Little Caledon Valley, Rooiberge, eastern Free State. *Mirafra* **14(3&4)**: 1-2.

Kopij, G., de Swardt, D.H. & Nuttall, R.J. (2002). Diet of pipits in South African grassland. *Ostrich* **73(1&2)**: 71-73.

Korelov, M.N. (1970). Alaudidae. In: Dolgushin, I.A., Korelov, M.N., Kuz'mina, M.A., Gavrilov, E.I., Gavrin, V.F., Kovshar, A.F. & Borodikhin, I.F. (1970). *Ptitsy Kazakhstana* **3**. Nauka Kazakhskoy SSR, Alma-Ata, Kazakhstan. In Russian.

Kosciuch, K.L. & Arnold, K.A. (2003). Novel nesting behavior in Cave Swallows. *Wilson Bull.* **115(3)**: 347-348.

Kose, M. & Moller, A.P. (1999). Sexual selection, feather breakage and parasites: the importance of white spots in the tail of the Barn Swallow (*Hirundo rustica*). *Behav. Ecol. Sociobiol.* **45**: 430-436.

Koshelev, A.I. (1980). [Nesting of the White-winged Lark (*Melanocorypha leucoptera* Pall.) in the south of the Barabinsk Forest Steppe]. *Trudy Biol. Inst. Sibirsk. Otd. Akad. Nauk SSSR* **44**: 234-240. In Russian.

Koskimies, P. (1989). *Distribution and Numbers of Finnish Breeding Birds. Appendix to Suomen Lintuatlas*. Lintutieto, Helsinki.

Köster, F. (1976). Über die Hoenhenanpassung von *Crotophaga ani* und *Tyrannus melancholicus* in den Anden Kolumbiens. [The adaptation to different altitudes by *Tyrannus melancholicus* and *Crotophaga ani* in the Colombian Andes]. *J. Orn.* **117(1)**: 75-99. In German with English summary.

Koster, S.H. & Grettenberger, J.F. (1983). A preliminary survey of birds in Park W, Niger. *Malimbus* **5(2)**: 62-72.
Kostin, Y.V. (1983). *Ptitsy Kryma*. Nauka, Moscow.
Kotagama, S.W. (1985). Research report. Preliminary observations on the birds at the Sinharaja International Man and Biosphere Reserve, Sri Lanka. Pp. 148-162 in: Anon. (1985).
Kovshar, A.F. (1979). Pevchie ptitsy v subvysokogor'e Tyan'-Shanya. Alma Ata. *Folia Zoologica* **28**: 337-346.
Kovshar, A.F. & Berezovikov, N.N. (1995). [On the biology of Small Skylark (*Alauda gulgula* Franklin, 1831) in the south-east of Kazakhstan]. *Selevinia* **3(2)**: 63-68. In Russian.
Kozená, I. (1975). The food of young House Martins (*Delichon urbica*) in the Krkonose Mountains. *Zool. Listy.* **24**: 149-162.
Kozená, I. (1979). A study of the qualitative composition of the diet of young swallows (*Hirundo rustica*) in an agricultural farm. *Folia Zoologica* **28**: 337-346.
Kozená, I. (1980). Dominance of items and diversity of the diet of young swallows (*Hirundo rustica*). *Folia Zoologica* **29**: 143-156.
Kozlova, E.V. (1981). Development of sexual dimorphism in *Eremophila* and its trend as a base to the investigation of the spreading of the genus. *Trudy Zool. Inst. Leningr.* **102**: 56-61.
Krabbe, N. (1984). An additional specimen of the Swallow-tailed Cotinga *Phibalura flavirostris boliviana*. *Bull. Brit. Orn. Club* **104(2)**: 68-69.
Krabbe, N. (1992). Notes on distribution and natural history of some poorly-known Ecuadorean birds. *Bull. Brit. Orn. Club* **112(3)**: 169-174.
Krabbe, N. & Sornoza, M.F. (1994). Avifaunistic results of a subtropical camp in the Cordillera del Condor, south-eastern Ecuador. *Bull. Brit. Orn. Club* **114**: 55-61.
Krabbe, N., Poulsen, B.O., Frølander, A. & Rodríguez, O. (1996). New observations of the White-tailed Shrike-tyrant *Agriornis andicola* in southern Ecuador. *Cotinga* **6**: 27-28.
Krabbe, N., Poulsen, B.O., Frølander, A. & Rodríguez, O. (1997). Range extensions of cloud forest birds from the high Andes of Ecuador: new sites for rare or little-recorded species. *Bull. Brit. Orn. Club* **117(4)**: 248-256.
Kral, M. (1987). Hnizdeni a ekologie koniasa horskeho (*Motacilla cinerea* Tunst.) v podhuri Nizkeho Jeseniku. [The nests and ecology of the Grey Wagtail in Nisky Jesnik]. *Zpravy Morav. Ornitolo. Sdruzeni* **45**: 75-104.
Krapu, G.L. (1986). Patterns and causes of change in a Cliff Swallow colony during a 17-year period. *Prairie Nat.* **18**: 109-114.
Kratter, A.W. (1997). Bamboo specialization by Amazonian birds. *Biotropica* **29(1)**: 100-110.
Kratzer, D. (1997). Der Steppenpieper *Anthus godlewskii*, eine neue Art für Deutschland. [Blyth's Pipit *Anthus godlewskii*, new to Germany]. *Limicola* **11(3)**: 117-119. In German with English summary.
Krebs, J.R., Wilson, J.D., Bradbury, R.B. & Siriwardena, G.M. (1999). The second Silent Spring? *Nature* **400**: 611-612.
Kren, J. (2000). *Birds of the Czech Republic*. Christopher Helm, London.
Kricher, J.C. & Davis, W.E. (1992). Patterns of avian species richness in disturbed and undisturbed habitats in Belize. Pp. 240-246 in: Hagan & Johnston (1992).
Kriegbaum, H. & Richter, K. (1996). Erfolgskontrollen von Landschaftspflegemaßnahmen in Unterfranken aufgezeigt am Beispel der Leitart Heidelerche. *Schrift. Bayerisch. Landes. Umweltsch.* **137**: 253-257.
Kriek, M., Leinberger, P., McAllister, J., Lock, G. & Boucher, J. (1995). Raritеite en ongewone waarnemings. *Laniarius* **57**: 26-27.
Krivitsky, I.A. (1962). O zimney ornithofaune Kurgaldjinskogo zapovednika. *Ornitologiya* **4**: 208–217.
Kroodsma, D.E. (1984). Songs of the Alder Flycatcher (*Empidonax alnorum*) and Willow Flycatcher (*Empidonax traillii*) are innate. *Auk* **101(1)**: 13–24.
Kroodsma, D.E. & Miller, E.H. eds. (1996). *Ecology and Evolution of Acoustic Communication in Birds*. Cornell University Press, Ithaca, New York.
Kroodsma, D.E., Ingalls, V.A., Sherry, T.W. & Werner, T.K. (1987). Songs of the Cocos Flycatcher: vocal behavior of a suboscine on an isolated oceanic island. *Condor* **89**: 75-84.
Krügel, M.M. & dos Anjos, L. (2000). Bird communities in forest remnants in the city of Maring, Paraná State, southern Brazil. *Orn. Neotropical* **11**: 315-330.
Krügel, M.M., Behr, E.R. & Oliveira, A.D. (2000). Avifauna da área de abrangência da Usina Hidrelétrica de Dona Francisca, região central do Rio Grande do Sul. Pp. 168-169 in: Straube *et al.* (2000). (Abstract).
Krüger, S. (1980). Zur Brutbiologie des Brachpiepers. *Falke* **27(10)**: 348-351.
Krüger, S. (1989). *Der Brachpieper*. Neue Brehm-Bücherei, Ziemsen, Wittenberg, Germany.
Küchler, W. (1936). Anatomische Untersuchungen an *Phytotoma rara* Mol. *J. Orn.* **84(3)**: 352-362.
Kuerzi, R.G. (1941). Life history studies of the Tree Swallow. *Proc. Linn. Soc. N.Y.* **52-53**: 1-52.
Kuhnen, K. (1985). On pair-formation in the Sand Martin, *Riparia riparia*. *J. Orn.* **126**: 1-13.
Kukish, A.I. & Noskov, G.A. (1976). [Photoperiodical regulation of before breeding moult of *Motacilla f. flava* L.]. *Biologicheskie Nauki* **8**: 11-15. In Russian.
Kumerloeve, H. (1963). *Calandrella rufescens niethammeri*, eine neue Stummellerchenform aus Inneranatolien (Türkei). *Vogelwelt* **84**: 146-148.
Kumerloeve, H. (1967). Zum Brutverbreitung der beiden *Calandrella*–Arten Kleinasiens. *Bonn. Zool. Beitr.* **13**: 509-519.
Kumerloeve, H. (1969). Zum Rassenbildung der Kurzzehenlerche, *Calandrella brachydactyla*, im vorderasiatischen Raum. *J. Orn.* **110**: 324-325.
Kummer, J. (1983). Winterbalz der Haubenlerche (*Galerida cristata* L.). *Beitr. Vogelkd.* **29(2)**: 118.
Kutac, E.A. (1989). *Birder's Guide to Texas*. Lone Star Books, Houston, Texas.
Kuzniak, S. (1967). [Observations on the breeding biology of the swallow, *Hirundo rustica* L.]. *Acta Orn.* **10(7)**: 177-211. In Polish with Russian and English summary.
La Touche, J.D.D. (1931-1934). *Handbook of the Birds of Eastern China*. Taylor & Francis, London.
Labitte, A. (1957a). Notes biologiques sur l'Alouette des champs (*Alauda arvensis*) dans le centre nord-ouest de la France. *Oiseau* **27**: 59-71.
Labitte, A. (1957b). Contribution a l'étude de la biologie de l'Alouette huppée en Pays Drouais (Eure-et-Loire). *Oiseau* **27**: 143-149.
Labitte, A. (1958). Observations sur *Lullula arborea* L. en Pays Drouais (Eure-et-Loire). *Oiseau* **28**: 39-52.
Lack, D. (1963). Cuckoo hosts in England. *Bird Study* **10**: 185-202.
Lack, P.C. (1976). The first recorded nest of the Pink-breasted Lark *Mirafra poecilosterna* (Reichenow). *Bull. Brit. Orn. Club* **96(3)**: 111-112.
Lack, P.C. (1977). The status of Friedmann's Bush Lark *Mirafra pulpa*. *Scopus* **1(2)**: 34-39.
Lack, P.C. (1985). The ecology of the land-birds of Tsavo East National Park. *Scopus* **9**: 2-23, 57-96.
Lack, P.C. (1986). Ecological correlates of migrants and residents in a tropical African savanna. *Ardea* **74**: 111-119.
Lack, P.C. (1997). Little-known African birds. Friedmann's Lark *Mirafra pulpa* - an enigma. *Bull. African Bird Club* **4(2)**: 132-134.
Lago-Paiva, C. (1996). Cavity nesting by Great Kiskadees (*Pitangus sulphuratus*): adaptation or expression of ancestral behavior? *Auk* **113(4)**: 953-955.
Laird, W. & Gencz, A. (1993). Field identification of Long-billed Pipit in the West Palearctic. *British Birds* **86(1)**: 6-15.
Lamarche, B. (1981). Liste commentée des oiseaux du Mali, 2e. partie: Passereaux. *Malimbus* **3**: 73-102.
Lamarche, B. (1988). *Liste Commentée des Oiseaux de Mauritanie*. Études Sahariennes et Ouest-Africaines **1(4)**. 164 pp.
Lamb, C.C. (1925). Some birds new to the Cape San Lucas region. *Condor* **27(3)**: 117-118.
Lambert, F.R. (1994). Notes on the avifauna of Bacan, Kasiruta and Obi, north Moluccas. *Kukila* **7(1)**: 1-9.
Lambeth, D.O. & Lambeth, S.O. (1988). Sprague's Pipit's nest in Polk County. *Loon* **60(3)**: 104-108.
Lamsfuss, G. (1998). *Die Vögel Sri Lankas. Ein Vogel- und Naturführer*. Max Kasparek Verlag, Heidelberg.
Land, H.C. (1970). *Birds of Guatemala*. Livingston Publishing Company, Wynnewood, Pennsylvania.
Landbeck, C.L. (1877). Bemerkungen über die Singvögel Chiles. *Zool. Garten* **18**: 233-261.
Landres, P.B. & MacMahon, J.A. (1980). Guilds and community organization: analysis of an oak woodland avifauna in Sonora, Mexico. *Auk* **97(2)**: 351-365.
Lane, D.G. (2003). First description of song display and other notes on the Bare-necked Fruitcrow (*Gymnoderus foetidus*, Cotingidae). *Orn. Neotropical* **14(4)**: 491-497.
Lane, S.G. (1965). Seasonal banding of Fairy Martins. *Austr. Bird Bander* **3**: 67-70.
Lang, M. (1987). Revier und Gesang einer Kurzzehenlerche *Calandrella brachydactyla* in Nordbayern. *Limicola* **1(3)**: 86-90.
Lange, H. (1951). On the song-length in the Sky-lark (*Alauda arvensis* L.). *Dan. Orn. Foren. Tidssk.* **45**: 34-43.
Langley, C.H. (1973). Orange-throated Longclaws and Black Eagles. *Promerops* **107**: 6.
Langrand, O. (1995). *Guide des Oiseaux de Madagascar*. Delachaux et Niestlé, Lausanne.
Languy, M. & Vansteenwegen, C. (1989). Influence of parental age on the growth of nestling swallows (*Hirundo rustica*). *Ardea* **77**: 227-232.
Lansdown, P. (1999). Comparison of Short-toed and Lesser Short-toed Larks. *British Birds* **92(6)**: 308-312.
Lanyon, S.M. (1985). Molecular perspective on Higher-Level relationships in the Tyrannoidea (Aves). *Syst. Zool.* **34(4)**: 404-418.
Lanyon, S.M. & Lanyon, W.E. (1989). The systematic position of the plantcutters, *Phytotoma*. *Auk* **106(3)**: 422-432.
Lanyon, W.E. (1960). The Middle American populations of the Crested Flycatcher *Myiarchus tyrannulus*. *Condor* **62(5)**: 341-350.
Lanyon, W.E. (1961). Specific limits and distribution of Ash-throated and Nutting Flycatchers. *Condor* **63(6)**: 421-449.
Lanyon, W.E. (1963a). Notes on a race of the Ash-throated Flycatcher, *Myiarchus cinerascens pertinax*, of Baja California. *Amer. Mus. Novit.* **2129**: 1-7.
Lanyon, W.E. (1963b). Experiments of species discrimination in *Myiarchus* flycatchers. *Amer. Mus. Novit.* **2126**: 1-16.
Lanyon, W.E. (1965). Specific limits of the Yucatan Flycatcher, *Myiarchus yucatanensis*. *Amer. Mus. Novit.* **2229**: 1-12.
Lanyon, W.E. (1967a). Review communication and relationships in the genus *Tyrannus*. *Auk* **84(4)**: 606-609.
Lanyon, W.E. (1967b). Revision and probable evolution of the *Myiarchus* flycatchers of the West Indies. *Bull. Amer. Mus. Nat. Hist.* **136(6)**: 331-370.
Lanyon, W.E. (1975). Behavior and generic status of the Rufous Flycatcher of Peru. *Wilson Bull.* **87(4)**: 441-455.
Lanyon, W.E. (1978). Revision of the *Myiarchus* flycatchers of South America. *Bull. Amer. Mus. Nat. Hist.* **161**: 429-627.
Lanyon, W.E. (1982a). Evidence for wintering and resident populations of Swainson's Flycatcher (*Myiarchus swainsoni*) in northern Suriname. *Auk* **99(3)**: 581-582.
Lanyon, W.E. (1982b). Behavior, morphology, and systematics of the Flammulated Flycatcher of Mexico. *Auk* **99(3)**: 414-423.
Lanyon, W.E. (1984a). A phylogeny of the kingbirds and their allies. *Amer. Mus. Novit.* **2797**: 1-28.
Lanyon, W.E. (1984b). The systematic position of the Cocos Flycatcher. *Condor* **86(1)**: 42-47.
Lanyon, W.E. (1985). A phylogeny of *Myiarchine* flycatchers. Pp. 360-380 in: Buckley *et al.* (1985).
Lanyon, W.E. (1986a). A phylogeny of the thirty-three genera in the *Empidonax* assemblage of tyrant flycatchers. *Amer. Mus. Novit.* **2846**: 1-29.
Lanyon, W.E. (1986b). Generic status of Euler's Flycatcher: a morphological and biochemical study. *Auk* **103(2)**: 341-350.
Lanyon, W.E. (1988a). A phylogeny of the flatbill and tody-tyrant assemblage of tyrant flycatchers. *Amer. Mus. Novit.* **2923**: 1-41.
Lanyon, W.E. (1988b). A phylogeny of the thirty-two genera in the *Elaenia* assemblage of tyrant flycatchers. *Amer. Mus. Novit.* **2914**: 1-57.
Lanyon, W.E. (1988c). The phylogenetic affinities of the flycatcher genera *Myiobius* Darwin and *Terenotriccus* Ridgway. *Amer. Mus. Novit.* **2915**: 1-11.
Lanyon, W.E. (1997). Great Crested Flycatcher (*Myiarchus crinitus*). No. **300** in: Poole & Gill (1997).
Lanyon, W.E. & Fitzpatrick, J.W. (1983). Behavior, morphology, and systematics of *Sirystes sibilator* (Tyrannidae). *Auk* **100**: 98-104.
Lanyon, W.E. & Fry, C.H. (1973). Range and affinity of the Pale-Bellied Mourner (*Rhytipterna immunda*). *Auk* **90(3)**: 672-674.
Lanyon, W.E. & Lanyon, S.M. (1986). Generic status of Euler's Flycatcher: a morphological and biochemical study. *Auk* **103(2)**: 341-350.
Laps, R. (2000). Efeito da fragmentação na avifauna do entorno da Reserva Biológica de Una, Una, Bahia. Pp. 169-170 in: Straube *et al.* (2000). (Abstract).
Lardelli, R. (1986). Nidification de l'Alouette calandrelle, *Calandrella brachydactyla*, dans la Vallée d'Ossola (Piemont, Italie). *Nos Oiseaux* **38(6)**: 294-295.
Larrison, E.J. & Sonnenberg, K.G. (1968). *Washington Birds: their Location and Identification*. Seattle Audubon Society, Seattle, Washington.
Larsen, T.B. (1991). The African Pied Wagtail *Motacilla aguimp* preying on butterflies. *Babbler* **21-22**: 80.
Larsson, L. & Strandvik, P. (1986). Wing length as a character for sexing Rock Pipits *Anthus spinoletta littoralis*. *Ringing & Migration* **7(2)**: 71-74.
Larsson, S. (1993). The first Black Lark for Sweden. *Birding World* **6(5)**: 189-190.
Larsson, S. (1994). [A Black Lark]. *Vår Fågelvärld* **53(3)**: 24-25. In Swedish.
Larsson, T. (1994). [Habitat selection, population dynamics and breeding biology of the Rock Pipit *Anthus spinoletta littoralis* in southeastern Sweden]. *Ornis Svecica* **4(4)**: 173-182. In Swedish with English summary.
Lasiewski, R.C. & Thompson, H.J. (1966). Field observation of torpidity in the Violet-green Swallow. *Condor* **68(1)**: 102-103.
Latham, P.C.M. (1981). Swallows seen at sea. *Notornis* **28(3)**: 219.
Laubman, A. (1934). Weitere Beiträge zur Avifauna Argentiniens. *Verh. Orn. Ges. Bayern* **20**: 249-336.
Lavers, N. (1975). The status of the Gray Flycatcher in Washington State. *Amer. Birds* **6**: 25–27.
Law, S.C. (1924). Some observations on *Pyrrhulauda grisea*. *Ibis* **Ser. 11, no. 6**: 645-647.
Lawrence, G.N. (1869). Characters of some South American birds, with notes on other rare or little known species. *Ann. Lyc. Nat. Hist.* **9**: 265-275.
Lawson, P. (1980). A rare bird in Nelspruit. *Witwatersrand Bird Club News* **109**: 4.
Lawson, W.J. (1961). The races of the Karoo Lark *Certhilauda albescens* (Lafresnaye). *Ostrich* **32**: 64-74.
Lawson, W.J. (1965a). Larger Striped Pipit at Wyebank. *Albatross* **126**: 3.
Lawson, W.J. (1965b). Short-tailed Pipits at Nyalazi. *Albatross* **126**: 5.
Le Berre, M. & Rostan, J.C. (1977). Inventaire de l'avifaune d'une zone de mise en valeur agricole dans le Constantinois. *Bull. Soc. Hist. Nat. Afr. Nord* **67**: 243-270.
Le Fur, R. (1975). Notes sur l'avifaune algérienne. *Alauda* **43**: 317-319.
Le Maitre, C. & Reynaud, P.A. (1994). Crimson-hooded Manakin display in a dense population: cooperation versus competition. Page 122 in: Dittami, J., Bock, W., Taborsky, M., van den Elzen, R. & Vogel-Millesi, E. eds. (1994). *Research Notes on Avian Biology 1994: Selected Contributions from the XXI International Ornithological Congress*. Journal für Ornithologie **135**(Supplement).
Lea, A.M. & Gray, J.T. (1935–1936). The food of Australian birds. Parts 1–5. *Emu* **34**: 275-292; **35**: 63-98, 145-178, 251-280, 335-347.
Leach, J.A. (1929). The lyrebird - Australia's wonder bird. *Emu* **28**: 206-207.
Leck, C.F. (1971). Overlap in the diet of some Neotropical birds. *Living Bird* **10**: 89-106.
Leck, C.F. (1972). Seasonal changes in feeding pressures of fruit- and nectar-feeding birds in Panama. *Condor* **74**: 54-60.
LeCroy, M. (1976). Bird observations in Los Roques, Venezuela. *Amer. Mus. Novit.* **2599**: 1-30.
Ledant, J.P. & Jacob, J.P. (1980). Status et conservation de l'Alouette lulu en haute Belgique. [Status and conservation of the Wood Lark in Belgium]. *Gerfaut* **70(1)**: 95-103. In French with English summary.
Ledant, J.P., Jacob, J.P., Jacobs, P., Mahler, F., Ochando, B. & Roché, J. (1981). Mise à jour de l'avifaune algérienne. *Gerfaut* **71**: 298-398.
Lederle, P.E. (1998). Differences in prehatching reproductive output between one-year old and older female Tree Swallows. Page 145 in: Anon. (1998b). (Abstract).
Ledger, J. ed. (1984). *Proceedings of the V Pan-African Ornithological Congress*. Southern African Ornithological Society, Johannesburg.
Lee, C.T. & Birch, A. (2002). Notes on the distribution, vagrancy, and field identification of American Pipit and "Siberian Pipit". *North Amer. Birds* **56(4)**: 388-398.
Lee, D.S. (1993). Range expansion of the Tree Swallow, *Tachycineta bicolor* (Passeriformes, Hirundinidae), in the southeastern United States. *Brimleyana* **1993**: 103-113.
Lee, D.S., Faanes, C. & Haney, J.C. (1996). Wintering Eastern Phoebes (*Sayornis phoebe*), *Empidonax* flycatchers and aseasonal records of kingbirds in the Bahama Islands. *Pitirre* **9(2)**: 4-6.
Lee, J.A. (1967). Relative reproductive efficiency of adult and subadult Purple Martins. *Chat* **31**: 1-2.
Lee, J.A. (1970). Some observations on the dispersal of fledgling Purple Martins from the nesting site. *Chat* **34**: 1-2.
Lee, J.A. (1982). Mortality rates in nesting Purple Martins. *Chat* **46(2)**: 45-46.
Lee, S.L.B. (1962). Yellow-browed Warbler and Tawny Pipit in Lewis. *Scottish Birds* **2(4)**: 250.
Lee Jones, H. (2004). *Birds of Belize*. Christopher Helm, London.
Lee Jones, H., McRae, E., Meadows, M. & Howell, S.N.G. (2000). Status updates for selected bird species in Belize, including several species previously undocumented from the country. *Cotinga* **13**: 17-31.
Leech, S.M. & Leonard, M.L. (1996). Is there an energetic cost to begging in nestling Tree Swallows (*Tachycineta bicolor*)? *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **263**: 983-987.
Lees-Smith, D.T. (1986). Composition and origins of the south-west Arabian avifauna: a preliminary analysis. *Sandgrouse* **7**: 70-91.
Lefebvre, G., Poulin, B. & McNeil, R. (1992). Settlement period and function of long-term territory in tropical mangrove passerines. *Condor* **94(1)**: 83.
Leffelaar, D. & Robertson, R.J. (1984). Do male Tree Swallows guard their mates? *Behav. Ecol. Sociobiol.* **16(1)**: 73-79.

Leffelaar, D. & Robertson, R.J. (1985). Nest usurpation and female competition for breeding opportunities by Tree Swallows. *Wilson Bull.* **97(2)**: 221-224.
Leffelaar, D. & Robertson, R.J. (1986). Equality of feeding roles and the maintenance of monogamy in Tree Swallows. *Behav. Ecol. Sociobiol.* **18**: 199-206.
Leger, D.W. & Mountjoy, D.J. (2003). Geographic variations in song of the Bright-rumped Attila (Tyrannidae: *Attila spadiceus*): implications for species status. *Auk* **120(1)**: 69-14. In English with Spanish summary.
LeGrand, H.E. & Hall, S.P. (1989). *Element Stewardship Abstract*-Contopus borealis. The Nature Conservancy, Arlington, Virginia.
Lehman, P. (1985). Calls of Alder and Willow Flycatcher. *Western Birds* **16**: 189.
von Lehmann, E. (1951). Zur Brutbiologie des Baumpiepers (*Anthus tr. trivialis* L.). [The breeding biology of the Tree Pipit (*Anthus tr. trivialis* L.)]. *Bonn. Zool. Beitr.* **2(3/4)**: 225-227.
von Lehmann, E. (1960). Contribuciones al estudio de la fauna de Colombia. *Noved. Colombianas* **1**: 270-271.
Lein, M.R. (2002). Pre-dawn singing by Dusky Flycatchers *Empidonax oberholseri*: seasonal and spatial patterns. Page 234 in: Anon. (2002a).
Leinonen, M. (1973a). On the breeding biology of the White Wagtail *Motacilla alba* in central Finland. *Ornis. Fenn.* **50(2)**: 53-82.
Leinonen, M. (1973b). Comparisons between the breeding biology of year-old and older females of the White Wagtail *Motacilla alba* in Central Finland. *Ornis Fenn.* **50**: 126-133.
Leinonen, M. (1974). The White Wagtail *Motacilla alba* as a semi-hole-nester. *Ornis Fenn.* **51**: 110-116.
Lekagul, B. & Round, P.D. (1991). *A Guide to the Birds of Thailand*. Saha Karn Bhaet, Bangkok.
Lencioni, F. (1996). Uma nova subespécie de *Knipolegus* (Aves, Tyrannidae) do estado da Bahia, Brasil. *Rev. Brasil. Biol.* **56(2)**: 197-201.
Lens, L., Bennun, L.A. & Duchateau, L. (2001). Landscape variables affect the density of Sharpe's Longclaw *Macronyx sharpei*, a montane grassland specialist. *Ibis* **143(4)**: 674-676.
Lens, L., Duchateau, L. & Bennun, L. (1996). How grassland fragmentation and change in land-use affect Sharpe's Longclaw *Macronyx sharpei*, a Kenyan highland endemic. Page 57 in: Ntiamoa-Baidu, Y. ed. (1996). *Proceedings of the Ninth Pan-African Ornithological Congress, Accra, Ghana, 1-7 December 1996*. (Abstract).
Lens, L., Muchai, M., Bennun, L.A. & Duchateau, L. (2000). Conservation planning in an agricultural landscape: the case of Sharpe's Longclaw. *Ostrich* **71(1&2)**: 300-303.
Lentino, M. (1988). *Notiochelidon flavipes*: a swallow new to Venezuela. *Bull. Brit. Orn. Club* **108(2)**: 70-71.
Lentino, M. & Colvée, J. (1998). *Lista de las Aves del Estado Delta Amacuro*. Sociedad Conservacionista Audubon de Venezuela, Caracas.
Leo, J., Wilke, T. & Alpers, D. (2002). Phylogenetic approaches to the evolution of migration. Page 64 in: Anon. (2002a). (Abstract).
Leonard, M.L. & Horn, A.G. (1996). Provisioning rules in Tree Swallows. *Behav. Ecol. Sociobiol.* **38**: 341-347.
Leonard, M.L. & Horn, A.G. (1998). Need and nestmates affect begging in Tree Swallows. *Behav. Ecol. Sociobiol.* **42**: 431-436.
Leonard, M.L., Fernández, N.J. & Brown, G. (1997). Parental calls and nestling behavior in Tree Swallows. *Auk* **114(4)**: 668-672.
Leonard, M.L., Horn, A.G., Brown, C.R. & Fernández, N.J. (1997). Parent-offspring recognition in Tree Swallows, *Tachycineta bicolor*. *Anim. Behav.* **54(5)**: 1107-1116.
Leonard, P. & Peters, W. eds. (1998). *Zambia Bird Report 1997*. Zambian Ornithological Society, Lusaka.
Leonovich, V.V., Demina, G.V. & Veprintseva, O.D. (1997). On the systematics and phylogeny of Eurasian pipits. *Byull. Mosk. Ova. Ispyt. Prir. Otd. Biol.* **102**: 14-22.
Leroux, C. (1998). *L'Apport de la Biométrie à l'Étude Phénologique de la Migration de l'Alouette des champs* (Alauda arvensis, *Alaudidae*). MSc thesis.
Lesinski, G. (1989). [Distribution and numbers of Crested Lark in Warsaw]. *Notatki Orn.* **29(3-4)**: 222-227. In Polish with English summary.
Leske, K.H. & Lederer, W. (1988). Moult, weight and biometrical data for some Palearctic passerine migrants in Zambia. *Ostrich* **59(1)**: 1-7.
Lethaby, N. (1994). Identification of immature Tree Swallow. *Birding World* **7(8)**: 320-322.
Lethaby, N. (1996). Identification of Tree, Northern Rough-winged, and Bank Swallows. *Birding* **28(2)**: 111-116.
Leukering, T. & Bradley, J. (1997). Some observations of birds on the central Mexican plateau. *Western Birds* **28**: 177-180.
Leveque, R. (1979). Nidification du Tyran bentevi *Pitangus sulphuratus* dans le Chubut (Argentine). *Alauda* **47(2)**: 116.
Lever, C. (1987). *Naturalized Birds of the World*. Longman Scientific & Technical, Harlow, UK.
Levey, D.J. (1987). Sugar-tasting ability and fruit selection in tropical fruit-eating birds. *Auk* **104(2)**: 173-179.
Levey, D.J. & Stiles, F.G. (1994). Birds: ecology, behavior, and taxonomic affinities. Pp. 217-226 in: McDade, L.A., Bawa, K.S., Hespenheide, H.A. & Hartshorn, G.S. eds. (1994). *La Selva: Ecology and Natural History of a Neotropical Rain Forest*. The University of Chicago Press, Chicago, Illinois. 486 pp.
Levy, C. (1996). Placement of nests. *Gosse Bird Club Broadsheet* **67**: 12.
Lewington, I., Alström, P. & Colston, P. (1991). *A Field Guide to the Rare Birds of Britain and Europe*. Harper Collins, London.
Lewis, A.D. (1982). The breeding of the Rufous-chested Swallow *Hirundo semirufa* in East Africa. *Scopus* **6(4)**: 103-105.
Lewis, A.D. (1989). Seasonality of Banded Martin *Riparia cincta* flocks in Kenya. *Scopus* **12(3-4)**: 100-101.
Lewis, A.D. & Pomeroy, D.E. (1989). *A Bird Atlas of Kenya*. A.A. Balkema, Rotterdam.
Li, H. (1991). Perpendicular migration of Hodgson's Pipit in Wolong Natural Conservation Area. *Chinese Wildlife* **1991(5)**: 20-24.
Li Zhenying & Wang Xuequan (1985). Breeding ecology of the Sand Martin, *Riparia riparia*. *Chinese Wildlife* **4**: 13-15.
Liebezeit, J.R. & George, T.L. (2002). Nest predators, nest-site selection, and nesting success of the Dusky Flycatcher in a managed ponderosa pine forest. *Condor* **104(3)**: 507-517. In English with Spanish summary.
Lifjeld, J.T. & Marstein, B. (1994). Paternity assurance behavior in the House Martin *Delichon urbica*. *J. Avian Biol.* **25**: 231-238.
Lifjeld, J.T. & Robertson, R.J. (1992). Female control of extra-pair fertilization in Tree Swallows. *Behav. Ecol. Sociobiol.* **31**: 89-96.
Lifjeld, J.T., Dunn, P.O., Robertson, R.J. & Boag, P.T. (1993). Extra-pair paternity in monogamous Tree Swallows. *Anim. Behav.* **45**: 213-229.
Liggitt, J. (1985). Wagtails "washing" food. *Nyala* **11(1)**: 28.
Ligon, J.D. (1971). Notes on the breeding of the Sulphur-bellied Flycatcher in Arizona. *Condor* **73(2)**: 250-252.
Ligon, J.S. (1961). *New Mexico Birds and Where to Find Them*. University of New Mexico Press, Albuquerque, New Mexico.
Lill, A. (1974). Sexual behaviour in the lek-forming White-bearded Manakin (*Manacus manacus trinitatis* Hartert). *Z. Tierpsychol.* **36**: 1-36.
Lill, A. (1975). The evolution of clutch-size and male "chauvinism" in the White-bearded Manakin. *Living Bird* **13**: 211-231.
Lill, A. (1976). *Lek Behaviour in the Golden-headed Manakin*, Pipra erythrocephala, *in Trinidad (West Indies)*. Advances in Ethology **18**, Paul Parey, Berlin.
Lill, A. (1979a). An assessment of male parental investment and pair bonding in the polygamous Superb Lyrebird. *Auk* **96(3)**: 489-498.
Lill, A. (1979b). Nest inattentiveness and its influence on development of the young in the Superb Lyrebird. *Condor* **81(3)**: 225-231.
Lill, A. (1980). Reproductive success and nest predation in the Superb Lyrebird *Menura superba*. *Austr. Wildl. Res.* **7(2)**: 271-280.
Lill, A. (1985). Lyrebird. Pp. 332-333 in: Campbell & Lack (1985).
Lill, A. (1986). Time-energy budget during reproduction and the evolution of single parenting in the Superb Lyrebird. *Austr. J. Zool.* **34**: 351-371.
Lill, A. (1987). Water vapour conductance and shell characteristics of Superb Lyrebird eggs. *Austr. J. Zool.* **35(6)**: 553-558.
Lill, A. (1991). Behavioural energetics of overwintering in the Rifleman, *Acanthisitta chloris*. *Austr. J. Zool.* **39**: 643-654.
Lill, A. (1996). Foraging behavioural ecology of the Superb Lyrebird. *Corella* **20(3)**: 77-87.
de Lima, F.C.T. (1999). A range extension for the Caatinga Black-tyrant, *Knipolegus franciscanus* (Tyrannidae), a rare Brazilian endemic. *Bull. Brit. Orn. Club* **119(4)**: 270-271.
Lind, E.A. (1960). *Zur Ethologie und Ökologie der Mehlschwalbe*. Annales Zoologici Societatis Zoologicae Botanicae Fennicae Vanamo **21**. 123 pp.
Lind, E.A. (1962). Verhalten der Mehlschwalbe, *Delichon urbica urbica* (L.) zu ihren Feinden. *Ann. Zool. Soc. Vanamo* **23**: 1-38.
Lind, E.A. (1963). Zum Schwarmverhalten der Mehlschwalbe. *Ann. Zool. Soc. Vanamo* **25**: 1-71.
Lind, E.A. (1964). Nistzeitliche Geselligkeit der Mehlschwalbe. *Ann. Zool. Fennici* **1**: 7-43.
Lindell, C. (1996). Patterns of nest usurpation: when should species converge on nest niches? *Condor* **98(3)**: 464-473.
Lindroos, T. & Tenovuo, O. (2000a). The field identification of Calandra and Bimaculated Larks and their status in Europe. *Alula* **6(1)**: 17-24.
Lindroos, T. & Tenovuo, O. (2000b). White-winged Lark - field identification and European distribution. *Alula* **6(4)**: 170-177.
Lindroos, T. & Tenovuo, O. (2002). Black Lark - its identification in the field and distribution in Europe. *Alula* **8(1)**: 22-28.
Lindsay, C.J., Phillipps, W.J. & Watters, W.A. (1959). Birds of Chatham Island and Pitt Island. *Notornis* **8**: 99-106.
Lindsey, T.R. (1992). *Encyclopedia of Australian Animals*. Birds. Angus & Robertson, NPIAW, Sydney.
Lindsey, T.R. (1994). The flamboyant extrovert that keeps to itself. *GEO Austr.* **16(4)**: 104-111.
Línek, V. (1999). [Occurrence and numbers of Crested Lark (*Galerida cristata*) in the city of Prague]. *Sylvia* **35(2)**: 69-81. In Polish.
Lines, J. & Moyes, A.W. (1996). White-winged Lark in Norfolk. *British Birds* **89(5)**: 232-234.
Lint, K.C. & Dolan, J.M. (1966). Successful breeding of the Orange-breasted Cotinga (*Pipreola jucunda*) in the San Diego Zoological Gardens. *Avicult. Mag.* **72**: 18-20.
Lippens, L. & Wille, H. (1976). *Les Oiseaux du Zaïre*. Éditions Lannoo, Tielt, Belgium.
Lister, M.D. (1954). A contribution to the ornithology of the Darjeeling area. *J. Bombay Nat. Hist. Soc.* **52**: 20-68.
Little, R. (1990). Cliff Swallow in Cleveland. *British Birds* **83(11)**: 505-506.
Littlefield, C.R. (1990). *Birds of Malheur National Wildlife Refuge, Oregon*. Oregon State University Press, Corvallis, Oregon.
Littlejohns, R.T. (1926). Filming lyrebirds. *Emu* **25**: 271-274.
Liu, B. (1998). [The wintering ecology of Mongolian Skylark]. *Chinese J. Zool.* **33(5)**: 9-11. In Chinese.
Liu Huanjin (1979). [Breeding process of the Crested Lark *Galerida cristata*]. *Chinese J. Zool.* **14(2)**: 30-31. In Chinese.
Livanov, S.G. (1987). [One record of the Richard's Pipit (*Anthus novaeseelandiae*) in central Ural Mountains]. *Ornitologiya* **22**: 185. In Russian.
Liversidge, R. (1996). A new species of pipit in southern Africa. *Bull. Brit. Orn. Club* **116**: 211-215.
Liversidge, R. (1998). The African Pipit enigma. *Bull. African Bird Club* **5(2)**: 105-107.
Liversidge, R. & Voelker, G. (2002). The Kimberley Pipit: a new African species. *Bull. Brit. Orn. Club* **122(2)**: 93-109.
Liversidge, R., Hawthorne, M. & Hawthorne, B. (1998). Mountain Pipit on migration. *Africa. Birds & Birding* **3(2)**: 13.
Llambías, P.E., Ferretti, V. & Rodríguez, P.S. (2001). Kleptoparasitism in the Great Kiskadee. *Wilson Bull.* **113(1)**: 116-117.
Llanes, A. & Abreu, E. (1994). Estudio de la Golondrina de Cuevas (*Hirundo fulva*) en Agramonte, Provincia de Matanzas, Cuba. *Pitirre* **7(3)**: 11.
Lloyd, H. (2000). Population densities of the Black-faced Cotinga *Conioptilon mcilhennyi* in south-east Peru. *Bird. Conserv. Int.* **10(3)**: 277-285.
Lloyd, P. (1997). Hatched in hell... Breeding strategy in Sclater's Lark. *Africa. Birds & Birding* **2(3)**: 14-15.
Lloyd, P. (1998). *A Study of the Ecology of the Namaqua Sandgrouse and other Arid-zone Birds*. PhD thesis, University of Cape Town, Cape Town.
Lloyd, P. (1999). Rainfall as a breeding stimulus and clutch size determinant in South African arid-zone birds. *Ibis* **141(4)**: 637-643.
Lloyd, P. (2004). Eight- to ten-day incubation and nestling periods among *Eremopterix* sparrow-larks. *Ibis* **146(2)**: 347-350.
Lloyd, P., Little, R.M. & Crowe, T.M. (2000). Investigator effects on the nesting success of arid-zone birds. *J. Field Orn.* **71**: 227-235.
Lo, V.K. (1994). Ocorrência de *Laniisoma elegans* (Thunberg, 1823) (Cotingidae) e *Fluvicola nengeta* (Linnaeus, 1766) (Tyrannidae) no município de São Paulo, SP. *Bol. CEO* **10**: 35-41.
Lobachev, Y.S. & Kapitonov, V.I. (1968). Ecology of the Horned Lark (*Eremophila alpestris albigula* Bp.) in the Karzhantau Mountains (West Tien-Shan). *Byull. Mosk. Ova. Ispyt. Prir. Otd. Biol.* **73**: 17-25
Lockwood, M.W. (1999). Possible anywhere. Fork-tailed Flycatcher. *Birding* **31**: 126-139.
Loesche, P., Stoddard, P.K., Higgins, B.J. & Beecher, M.D. (1991). Signature versus perceptual adaptations for individual vocal recognition in swallows. *Behaviour* **118**: 15-25.
Loftin, R.W. & Roberson, D. (1983). Infanticide by a Purple Martin. *Wilson Bull.* **95(1)**: 146-148.
Lohoefener, R.R. (1980). *Comparative Breeding Biology and Ethology of Colonial and Solitary Nesting Barn Swallows* (Hirundo rustica) *in East-Central Mississippi*. PhD thesis, Mississippi State University, Starkville, Mississippi.
Löhrl, H. (1971). Die Auswirkungen einer Witterungskatastrophe auf den Brutbestand der Mehlschwalbe in verschiedenen Orten in Südwestdeutschland. *Vogelwelt* **92**: 58-66.
Loiselle, B.A. & Blake, J.G. (1999). Dispersal of melastome seeds by fruit-eating birds of tropical forest undestory. *Ecology* **80(1)**: 330-336.
Lombardo, M.P. (1985). Mutual restraint in Tree Swallows: a test of the TIT FOR TAT model of reciprocity. *Science* **227**: 1363-1365.
Lombardo, M.P. (1986a). A possible case of adult intraspecific killing in the Tree Swallow. *Condor* **88(1)**: 112.
Lombardo, M.P. (1986b). Extra-pair copulations in the Tree Swallow. *Wilson Bull.* **98**: 150-152.
Lombardo, M.P. (1986c). Yearling-biased female mortality in Tree Swallows. *Condor* **88(4)**: 520-521.
Lombardo, M.P. (1986d). Attendants at Tree Swallow nests. I. Are attendants helpers at the nest? *Condor* **88(3)**: 297-303.
Lombardo, M.P. (1987a). Attendants at Tree Swallow nests. II. The exploratory-dispersal hypothesis. *Condor* **89(1)**: 138-149.
Lombardo, M.P. (1987b). Attendants at Tree Swallow nests. III. Parental responses to live and stuffed model attendants. *Condor* **89(4)**: 768-778.
Lombardo, M.P. (1988). Evidence of intraspecific brood parasitism in the Tree Swallow *Wilson Bull* **100**: 126-128.
Lombardo, M.P. (1991). Sexual differences in parental effort during the nestling period in Tree Swallows (*Tachycineta bicolor*). *Auk* **108**: 393-404.
Lombardo, M.P. (1994). Nest architecture and reproductive performance in Tree Swallows (*Tachycineta bicolor*). *Auk* **111**: 814-824.
Lombardo, M.P. (1995). Within-pair copulations: are female Tree Swallows feathering their own nests? *Auk* **112(4)**: 1077-1079.
Lombardo, M.P. (2001). Individual and seasonal variation in external genitalia of male Tree Swallows. *Auk* **118(3)**: 789-795.
Lombardo, M.P., Bosman, R.M., Faro, C.A., Houtteman, S.G. & Kluisza, T.S. (1995). Effect of feathers as nest insulation on incubation behavior and reproductive performance of Tree Swallows (*Tachycineta bicolor*). *Auk* **112(4)**: 973-981.
Lombardo, M.P., Forman, A.N., Czarnowski, M.R. & Thorpe, P.A. (2002). Individual, temporal, and seasonal concentration in Tree Swallows. *Condor* **104(4)**: 803-810.
Londoño, G.E. (2003). Information on nesting of *Laniocera hypopyrrha*. MS.
Long, A.G. (1954). Grey Wagtail rearing three broods. *British Birds* **48**: 286.
Long Guozhen & Li Hanhua (1985). Breeding of the Forest Wagtail *Dendronanthus indicus* in Guilin (Guangxi). *Chinese J. Zool.* **2**: 41-42.
Longo, J.M., Fischer, E.A., Fischer, W.A. & de Souza, P.R. (2000). Predação de morcegos por *Pitangus sulphuratus* (Tyrannidae) no Pantanal do Miranda, Mato Grosso do Sul. Pp. 241-242 in: Straube *et al.* (2000). (Abstract).
de Lope, F. (1980). Biologie de la réproduction de l'Hirondelle rousseline *Hirundo daurica* en Espagne. *Alauda* **48(2&3)**: 99-112.
de Lope, F. (1981a). La ocupación de nidos de *Hirundo daurica*. *Doñana Acta Vertebrata* **8(1-2)**: 311-313.
de Lope, F. (1981b). La invasión de *Hirundo daurica rufula* Temm. en la Península Ibérica. [The invasion of *Hirundo daurica* in the Iberian Peninsula]. *Doñana Acta Vertebrata* **8(1-2)**: 313-318. In Spanish with English summary.
de Lope, F. (1983). La reproduction d'*Hirundo rustica* en Extrémadoure (Espagne). *Alauda* **51(2)**: 81-91.
de Lope, F. (1985). Pterilosis y dimorfismo sexual de *Hirundo rustica* L. en Extremadura (España). *Ardeola* **32(1)**: 3-8.
de Lope, F. (1986). La biometría del Avión Común (*Delichon urbica* L.) en Badajoz, España. *Ardeola* **33**: 171-176.
de Lope, F. (2003b). Golondrina Dáurica *Hirundo daurica*. Pp. 386-387 in: Martí & del Moral (2003).
de Lope, F. (2003c). Avión Común *Delichon urbica*. Pp. 388-389 in: Martí & del Moral (2003).
de Lope, F. & de la Cruz, C. (1989). El desarrollo de los pollos en la Golondrina Común (*Hirundo rustica* L.): las diferencias entre las crianzas. *Ardeola* **36**: 55-60.
de Lope, F. & Møller, A.P. (1993a). Effects of ectoparasites on reproduction of their swallow hosts: a cost of being multi-brooded. *Oikos* **67**: 557-562.
de Lope, F. & Møller, A.P. (1993b). Female reproductive effort depends on the degree of ornamentation of their mates. *Evolution* **47**: 1152-1160.

de Lope, F. & da Silva, E. (1988). La fidelidad al lugar de nidificación o de nacimiento en el Avión Común (*Delichon urbica urbica*) en Badajoz, España. *Ardeola* **35(1)**: 51-58.
de Lope, F., González, G., Pérez, J.J. & Møller, A.P. (1993). Increased detrimental effects of ectoparasites on their bird hosts during adverse environmental conditions. *Oecologia* **95**: 234-240.
de Lope, F., Møller, A.P. & de la Cruz, C. (1998). Parasitism, immune response and reproductive success in the House Martin *Delichon urbica*. *Oecologia* **114**: 188-193.
López, A., Lynch, J.F. & Mackinnon de Montes, B. (1989). New and noteworthy records of birds from the eastern Yucatán Peninsula Mexico. *Wilson Bull.* **101(3)**: 390-409.
López, B. (1997). *Inventario de las Aves del Parque Nacional "Río Pilcomayo", Formosa, Argentina*. Literature of Latin America, Buenos Aires.
López, B. (1999a). New records of Pale-footed Swallow *Notiochelidon flavipes* in the Cordillera Central, Colombia. *Cotinga* **12**: 72.
López, B. (1999b). An unusual altitudinal record of Brownish Twistwing *Cnipodectes subbrunneus*. *Cotinga* **12**: 74.
López, B. (2000). Display and mechanical sound in Dusky Piha *Lipaugus fuscocinereus*. *Cotinga* **13**: 44-45.
López, B., Salaman, P.G.W., Cowley, T.P., Arango, S. & Renjifo, L.M. (2000). The threatened birds of the Río Toche, Cordillera Central, Colombia. *Cotinga* **14**: 17-23.
López, C. (1997). Homologació de rareses ornitològiques a Mallorca i Formentera. Informe de 1997. *Anuari Ornitol. Balears* **12**: 201-218.
López, C. (1998). Homologació de rareses ornitològiques a Mallorca i Formentera. Informe de 1998. *Anuari Ornitol. Balears* **13**: 127-141.
López, V. (2003). Lavandera Cascadeña *Motacilla cinerea*. Pp. 400-401 in: Martí & del Moral (2003).
López-Calleja, M.V. & Bozinovic, F. (1999). Feeding behavior and assimilation efficiency of the Rufous-tailed Plantcutter: a small herbivore. *Condor* **101(3)**: 705-710.
López-Calleja, M.V. & Bozinovic, F. (2000). Energetics and nutritional ecology of small herbivorous birds. [Ecología energética y nutricional en aves herbívoras pequeñas]. *Rev. Chilena Hist. Nat.* **73**: 411-420. In English with Spanish summary.
Lord, E.A.R. (1956). The birds of the Murphy's Creek District, southern Queensland. *Emu* **56**: 100-128.
Lorenzo, J.A. & Barone, R. (2003). Bisbita Caminero *Anthus berthelotti*. Pp. 392-393 in: Martí & del Moral (2003).
Lorge, P. (1998). Eine Kartierung der Vorkommen von Schafstelze *Motacilla flava*, Wiesenpieper *Anthus pratensis* und Braunkehlchen *Saxicola rubetra* in drei ausgewählten Grünlandgebieten Luxemburgs: Étude comparative entre la Bergeronnette printanière *Motacilla flava*, le Pipit farlouse *Anthus pratensis* et le Tarier des prés *Saxicola rubetra* dans trois zones de particulture au Luxembourg. *Regulus* **17**: 68-86.
Loske, K.H. (1983). Zur Kolonietreue mehr- und einjähriger Uferschwalben (*Riparia riparia*) in Mittelwestfalen - ein Zwischenbericht. *Beih. Veröff. Naturschutz Landschaftspflege Bad-Württ.* **37**: 79-87.
Loske, K.H. (1984). Beobachtungen an mittelwestfälischen Schlafplätzen der Rauchschwalbe (*Hirundo rustica*). *Vogelwelt* **105**: 51-60.
Loske, K.H. (1985). [Habitat, population density and population development of the Tree Pipit (*Anthus trivialis*) in Middle Westphalia]. *Ecol. Birds* **7(1)**: 135-154. In German with English summary.
Loske, K.H. (1986a). The origins of European swallows wintering in Namibia and Botswana. *Ringing & Migration* **7**: 119-121.
Loske, K.H. (1986b). Masse und Gewichte in einer mittelwestfälischen Populationen der Mehlschwalbe (*Delichon urbica*). *Vogelwarte* **33**: 332-335.
Loske, K.H. (1987a). Habitatwahl des Baumpiepers (*Anthus trivialis*). *J. Orn.* **128(1)**: 33-47.
Loske, K.H. (1987b). [On the ethology of the Tree Pipit (*Anthus trivialis*)]. *Ecol. Birds* **9(1)**: 1-30. In German with English summary.
Loske, K.H. (1989). Zur Brutbiologie der Rauchschwalbe (*Hirundo rustica*) in Mittelwestfalen. *Vogelwelt* **109**: 59-82.
Loske, K.H. (1990a). Zur Wegzug der Rauchschwalbe *Hirundo rustica* in Mittelwestfalen. *Vogelwelt* **111**: 122-141.
Loske, K.H. (1990b). Zur Biometrie und Gewichtsentwicklung der Rauchschwalbe (*Hirundo rustica*) in Mittelwestfalen. *Vogelwarte* **35**: 186-201.
Loske, K.H. (1994). *Untersuchungen zur Überlebensstrategien der Rauchschwalbe (*Hirundo rustica*) im Brutgebiet*. PhD thesis, Universität Göttingen, Göttingen, Germany.
Loske, K.H. (1996). Ein wichtiger Schlafplatz europäischer Rauchschwalben *Hirundo rustica* in Nigeria und seine Bedrohung. *Limicola* **10**: 42-48.
Loskot, V.M. (1989). Data on distribution, systematics and life history of Desert Lark (*Ammomanes deserti* (Licht.)) in the USSR. *Trudy Zool. Inst. Leningr.* **197**: 61-77.
Loskot, V.M. (2001). A new subspecies of Pale Sand Martin, *Riparia diluta* (Sharpe & Wyatt) from the Altai and Middle Siberia (Aves: Hirundinidae). *Zoosyst. Ross.* **9**: 461-462.
Loskot, V.M. & Dickinson, E.C. (2001). Systematic notes on Asian birds. 15. Nomenclature issues concerning the Common Sand Martin, *Riparia riparia* (Linnaeus, 1758) and the Pale Sand Martin, *R. diluta* (Sharpe & Wyatt, 1893), with a new synonymy. Pp. 167-174 in: Dekker & Dickinson (2001b).
Lotem, A. (1998). Differences in begging behaviour between Barn Swallow, *Hirundo rustica*, nestlings. *Anim. Behav.* **55**: 809-818.
Lou Juxian (1966). [Preliminary observations on the breeding ecology of the Skylark *Alauda arvensis*]. *Chinese J. Zool.* **8(1)**: 19-22. In Chinese.
Louette, M. (1981). *The Birds of Cameroon. An Annotated Check-list*. Paleis der Academiën, Brussel.
Louette, M. (1992). Barriers, contact zones and subspeciation in central equatorial Africa. Pp. 209-216 in: Monk (1992).
Louette, M. & Prévost, J. (1987). Passereaux collectés par J. Prévost au Cameroun. *Malimbus* **9(2)**: 83-96.
Louw, K. (2000). *The Habitat Preferences and Conservation Status of the Agulhas Long-billed Lark* Certhilauda brevirostris *in South Africa*. BSc thesis, University of Cape Town, Cape Town.
Lovegrove, T.G. (1970). Some notes on the nesting of Welcome Swallows in the Central Northland. *Notornis* **17(4)**: 285.
Lovett, R. & Brina, G. (2001). First documented record of Long-tailed (Mountain) Wagtail *Motacilla clara* in Botswana. *Babbler* **39**: 49.
Low, R. (1980). Breeding the Scarlet Cock-of-the-rock at Houston Zoo. *Avicult. Mag.* **86(1)**: 1-4.
Low, R. (1995). The Umbrellabird - a little known inhabitant of Neotropical forests. *Avicult. Mag.* **101(3)**: 98-122.
Lowe, P.O., Ffolliott, P.F., Dieterich, J.H. & Patton, D.R. (1978). *Determining Potential Wildlife Benefits from Wildfire in Arizona Ponderosa Pine Forests*. USDA Forest Service General Technical Report **RM-52**.
Lowe, P.R. (1938). Some anatomical notes on the genus *Pseudochelidon* Hartlaub with reference to its taxonomic position. *Ibis* **Ser. 14, no. 2**: 429-437.
Lowen, J.C. (2001). Neotropical News. Brazil. Alagoas reserve threatened. *Cotinga* **16**: 10.
Lowen, J.C. (2002a). Conservation awards. New awards. Ecology and conservation of Chestnut-capped Piha *Lipaugus weberi* in Colombia. *Cotinga* **18**: 6.
Lowen, J.C. (2002b). Neotropical News. Ecuador. New gnatcatcher in danger of disappearing before being described. *Cotinga* **18**: 11-12.
Lowen, J.C. (2003). Conservation awards. Update. Chestnut-capped *Lipaugus weberi* in Colombia. Piha Corona Castaña *Lipaugus weberi* en Colombia. *Cotinga* **19**: 10. In Spanish and English.
Lowen, J.C., Bartrina, L., Clay, R.P. & Tobias, J.A. (1996). *Biological Surveys and Conservation Priorities in Eastern Paraguay: the Final Reports of Projects Canopy '92 and Yacutinga '95*. CSB Conservation Publications, Cambridge.
Lowen, J.C., Clay, R.P., Brooks, T.M., Esquivel, E.Z., Bartrina, L., Barnes, R., Butchart, S.H.M. & Etcheverry, N.L. (1995). Bird conservation in the Paraguayan Atlantic forest. *Cotinga* **4**: 58-64.
Lowen, J.C., Clay, R.P., Mazar, J., Madroño, A., Pearman, M., López, B., Tobias, J.A., Liley, D.C., Brooks, T.M., Esquivel, E.Z. & Reid, J.M. (1997). New and noteworthy observations on the Paraguayan avifauna. *Bull. Brit. Orn. Club* **117(4)**: 275-293.
Lowery, G.H. & Dalquest, W.W. (1951). *Birds from the State of Veracruz, Mexico*. University of Kansas Publications, Museum of Natural History **3(4)**. University of Kansas, Lawrence, Kansas. 119 pp.
Lowery, G.H. & O'Neill, J.P. (1966). A new genus and species of cotinga from eastern Peru. *Auk* **83(1)**: 1-9.
Lowther, P.E. (1999). Alder Flycatcher (*Empidonax alnorum*). No. **446** in: Poole & Gill (1999).
Lowther, P.E. (2000). Pacific-slope Flycatcher (*Empidonax difficilis*) Cordilleran Flycatcher (*Empidonax occidentalis*). No. **556** in: Poole & Gill (2000b).
Lowther, P.E. (2002). Thick-billed Kingbird (*Tyrannus crassirostris*). No. **604** in: Poole & Gill (2002).
Lowther, P.E. & Stotz, D.F. (1999). Sulphur-bellied Flycatcher (*Myiodynastes luteiventris*). No. **475** in: Poole & Gill (1999).
Loye, J.E. & Carroll, S.P. (1991). Nest ectoparasite abundance and Cliff Swallow colony site selection, nestling development, and departure time. Pp. 222-241 in: Loye & Zuk (1991).
Loye, J.E. & Zuk, M. eds. (1991). *Bird-Parasite Interactions: Ecology, Evolution and Behaviour*. Oxford University Press, Oxford.
Loyn, R.H. (2002). Patterns of ecological segregation among forest and woodland birds in south-eastern Australia. *Orn. Sci.* **1**: 7-27.
Loyn, R.H. & Loyn, J.A. (2002). Albert's Lyrebird foraging from epiphytes in rainforest sub-canopy. *Austr. Bird Watcher* **19(6-7)**: 203-204.
Lozano, G.A. (1994). Size, condition, and territory ownership in male Tree Swallows (*Tachycineta bicolor*). *Can. J. Zool.* **72**: 330-333.
Lozano, G.A. & Handford, P.T. (1995). A test of an assumption of delayed plumage maturation hypotheses using female Tree Swallows. *Wilson Bull.* **107**: 153-164.
Luciano, D. (1998). Nuevas observaciones de la Monjita Castaña (*Neoxolmis rubetra*) en la provincia de Buenos Aires, Argentina. *Nuestras Aves* **38**: 8-9.
Luck, G.W. & Daily, G.C. (2003). Tropical countryside bird assemblages: richness, composition, and foraging differ by landscape context. *Ecol. Appl.* **13(1)**: 235-247.
Lunais, B. (1983). Sur l'observation de deux Ammomanes de Dunn *Eremalauda dunni* dans le Parc National du Banc d'Arguin (Mauritanie). *Oiseau et RFO* **53(2)**: 182-183.
Lunais, B. (1984). Données sur l'avifaune terrestre résidente du Parc National du Banc d'Arguin (Mauritanie). *Alauda* **52**: 256-265.
Lundberg, D. (2001). A case of polyandry in Pied Wagtails *Motacilla alba*. *Ornis Svecica* **11(1-2)**: 95-97.
Lunk, W.A. (1962). *The Rough-winged Swallow* Stelgidopterix ruficollis *(Vieillot): a Study Based on its Breeding Biology in Michigan*. Publications of the Nuttall Ornithological Club **4**, Cambridge, Massachusetts. 155 pp.
Lüps, P., Biber, O. & Nussbaumer, M.A. (1993). Erklären die Singflüge der Feldlerche *Alauda arvensis* den Sexualdimorphismus in der Flügelgröße? *Jahr. Naturhistorisch. Mus. Bern* **11**: 117-124.
Luy, A. & Bigio, D. (1994). Notes on the feeding habits of the Andean Cock-of-the-rock (*Rupicola peruviana*). *Orn. Neotropical* **5(2)**: 115-116.
Lynes, H. (1924). On the birds of north and central Darfur. *Ibis* **Ser. 11, no. 6**: 648-719.
Lynes, H. (1934). *Contribution to the Ornithology of Southern Tanganyika Territory*. Journal für Ornithologie **82**. 147 pp.
Lynes, H. (1938). *Contribution to the Ornithology of the Southern Congo Basin*. Revue de Zoologie et de Botanique Africaines **31**, Belgium. 129 pp.
Lyuleeva, D.S. (1973). Features of swallow biology during migration. Pp. 219-272 in: Bykhovskii, B.E. ed. (1973). *Bird Migrations: Ecological and Physiological Factors*. John Wiley, Chichester, UK.
Lyuleeva, D.S. (1974). The breeding biology of the swallows *Delichon urbica*, *Hirundo rustica* and *Riparia riparia*. *Trudy Inst. Zool. Akad. Nauk Kazhs. SSSR* **55**: 101-141.
Ma Ming, Carey, G., Lewthwaite, R., Leader, P., Hockett, J., Kilburn, M. & Worfolk, T. (2000). [The new evidence on the migratory birds passing through the center of Taklimakan Desert]. Pp. 322-326 in: Anon. (2000d).
MacBriar, W.N. & Stevenson, D.E. (1976). Dispersal and survival in the Bank Swallow (*Riparia riparia*) in southeastern Wisconsin. *Contrib. Biol. Geol. Milwaukee Publ. Mus.* **10**: 1-14.
Maccormick, A. (2004). Mammal bone used as a source of extraneous calcium by a Neotropical swallow. MS.
Macdonald, D.W. (1981). Feeding associations between capybaras *Hydrochoerus hydrochaeris* and some bird species. *Ibis* **123(3)**: 364-366.
Macdonald, I.A.W. (1984). An analysis of the role of the Hluhluwe-Umfolozi Game Reserves Complex in the conservation of the avifauna of Natal. Pp. 601-638 in: Ledger (1984).
Macdonald, J.D. (1952a). Notes on the taxonomy of the Clapper Larks of South Africa. *Ibis* **94**: 629-635.
Macdonald, J.D. (1952b). Notes on the Long-billed Lark *Certhilauda curvirostris*. *Ibis* **94**: 122-127.
Macdonald, J.D. (1953). Taxonomy of the Karoo and Redback Larks of western South Africa. *Bull. Brit. Mus. (Nat. Hist.) Zool.* **1**: 321-350.
Macdonald, J.D. (1969). Albert Lyrebird in Blackall Range. *Emu* **59**: 118-119.
Macdonald, J.D. (1988). *Birds of Australia. A Summary of Information*. Reed, Frenchs Forest, Australia.
Macdonald, J.D. & Cave, F.O. (1948). Recent additions to the Sudan check-list of birds. *Ibis* **90(2)**: 240-251.
Macdonald, K.C. (1906). A list of birds found in Myingyan District of Burma. Part 1. *J. Bombay Nat. Hist. Soc.* **17**: 184-194.
MacDougall-Shackleton, E.A. & Robertson, R.J. (1995). Mate guarding tactics used by Great Crested Flycatchers. *Wilson Bull.* **107**: 757-761.
Maceda, J.J., Kim, M.S. & Tittarelli, F. (1997). Nuevos registros de aves para la Provincia de la Pampa, Argentina. *Nuestras Aves* **37**: 4-5.
MacGregor, J.N. & Feely, J.M. (1952). Field guide to the larks of the South Western Cape. *Bokmakierie* **4(2)**: 36-39.
Machado, A.B.M., da Fonseca, G.A.B., Machado, R.B., Aguiar, L.M.S. & Lins, L.V. eds. (1998). *Livro Vermelho das Espécies Ameaçadas de Extinção da Fauna de Minas Gerais*. Fundação Biodiversitas, Belo Horizonte, Brazil.
Machado, C.G. & Rodrigues, N.M.R. (2000). Alteração de altura de forrageamento de espécies de aves quando associadas a bandos mistos. [Changes in birds-foraging height when associated in mixed flocks]. Pp. 231-239 in: Alves *et al.* (2000). In Portuguese with English summary.
Mack, C. (1972). Nesting notes on swallows. *Bokmakerie* **24(3)**: 55.
Mackenzie, B.N. (1982). Communal roosting in the Cape Wagtail. *Promerops* **152**: 7.
Mackenzie, D.I. & Sealy, S.G. (1981). Nest site selection in Eastern and Western Kingbirds: a multivariate approach. *Condor* **83(4)**: 310-312.
MacKenzie, D.I., Sealy, S.G. & Sutherland, G.D. (1982). Nest-site characteristics of the avian community in the dune-ridge forest, Delta Marsh, Manitoba: a multivariate analysis. *Can. J. Zool.* **60**: 2212–2223.
Mackinnon, B., Laesser, J., Rotenberg, J. & Téllez, L.I. (2003). *Eremophila alpestris* (Alaudidae): a new bird species and family for the Yucatan Peninsula, Mexico. *Huitzil* **4(1)**: 1-2.
MacKinnon, J. (1988). *Field Guide to the Birds of Java and Bali*. Gadjah Mada University Press, Yogyakarta, Indonesia.
MacKinnon, J. & Phillipps, K. (1993). *A Field Guide to the Birds of Borneo, Sumatra, Java and Bali*. Oxford University Press, Oxford.
MacKinnon, J. & Phillipps, K. (2000). *A Field Guide to the Birds of China*. Oxford University Press, Oxford.
Mackowicz, R. (1970). [Biology of the Woodlark *Lullula arborea* in the Rzepin Forest, western Poland]. *Acta Zool. Cracoviensia* **15(2)**: 61-160.
Mackworth-Praed, C.W. & Grant, C.H.B. (1960). *African Handbook of Birds. Series One. Birds of Eastern and North Eastern Africa*. Vol. 2. Longman, London & New York.
Mackworth-Praed, C.W. & Grant, C.H.B. (1962). *African Handbook of Birds. Series Two. Birds of the Southern Third of Africa*. Vol. 1. Longman, London & New York.
Mackworth-Praed, C.W. & Grant, C.H.B. (1963). *African Handbook of Birds. Series Two. Birds of the Southern Third of Africa*. Vol. 2. Longman, London & New York.
Mackworth-Praed, C.W. & Grant, C.H.B. (1970). *African Handbook of Birds. Series Three. Birds of West Central and Western Africa*. Vol. 1. Longman, London & New York.
Mackworth-Praed, C.W. & Grant, C.H.B. (1973). *African Handbook of Birds. Series Three. Birds of West Central and Western Africa*. Vol. 2. Longman, London & New York.
Maclean, G.L. (1957). Nests of Pallid Karoo Lark in Namib Desert. *Ostrich* **28**: 124.
Maclean, G.L. (1969). South African lark genera. *Cimbebasia (Ser. A)* **1**: 79-94.
Maclean, G.L. (1970a). Breeding behaviour of larks in the Kalahari sandveld. *Ann. Natal Mus.* **20**: 381-401.
Maclean, G.L. (1970b). The biology of the larks (Alaudidae) of the Kalahari sandveld. *Zool. Afr.* **5**: 7-39.
Maclean, G.L. (1974a). Vocal imitation in *Galerida magnirostris*. *Ostrich* **45**: 193.
Maclean, G.L. (1974b). Arid-zone adaptations in southern African birds. *Cimbebasia (Ser. A)* **3**: 163-176.
Maclean, G.L. (1993a). *Roberts' Birds of Southern Africa*. 6th edition. Trustees of the John Voelcker Bird Book Fund, Cape Town.
Maclean, G.L. (1993b). The Blue Swallow can be managed. *Birding in SA* **45(4)**: 108-109.
Maclean, G.L. (1999). Southern African endemic birds: their distribution and conservation. Pp. 43-78 in: Adams & Slotow (1999).
Maclean, G.L. & Maclean, C. (1993). A new host for the Red-chested Cuckoo *Cuculus solitarius* in southern Africa. *Ostrich* **64(3)**: 136.
Maclean, G.L. & Prys-Jones, R.P. (1988). Kleptoparasitism in three species of passerine birds. *Ostrich* **59**: 45-47.
Macmillen, R.E. (1990). Water economy of granivorous birds: a predictive model. *Condor* **92(2)**: 379-392.
MacQueen, P.M. (1950). Territory and song in the Least Flycatcher. *Wilson Bull.* **62**: 194-205.
Madden, E.M., Hansen, A.J. & Murphy, R.K. (1999). Influence of prescribed fire history on habitat and abundance of passerine birds in northern mixed-grass prairie. *Can. Field-Nat.* **113(4)**: 627-640.
Madden, E.M., Murphy, R.K., Hansen, A.J. & Murray, L. (2000). Models for guilding management of prairie bird habitat in northwestern North Dakota. *Amer. Midl. Nat.* **144(2)**: 377-392.
Madge, S.C. (1972). Angola Swallows breeding near Ndola. *Bull. Zambian Orn. Soc.* **4**: 60.
Madge, S.C. (1988). Mongolian and White-winged Larks. *British Birds* **81**: 635-654.

Madge, S.C. & Redman, N.J. (1989). The existence of a form of Cliff Swallow, *Hirundo* sp., in Ethiopia. *Scopus* **13**: 126-129.

Madoc, G.C. (1976). *An Introduction to Malayan Birds*. Malayan Nature Society, Kuala Lumpur.

Madroño, A. & Esquivel, E.Z. (1995). Reserva Natural del Bosque de Mbaracayú: su importancia en la conservación de aves amenazadas, cuasi-amenazadas y endémicas del Bosque Atlántico. *Cotinga* **4**: 52-57.

Madroño, A. & Esquivel, E.Z. (1997). Noteworthy records and range extensions of some birds from the Reserva Natural del Bosque Mbaracayú (Mbaracayú Forest Nature Reserve), Departamento de Canindeyú, Paraguay. *Bull. Brit. Orn. Club* **117(3)**: 166-176.

Madroño, A., Clay, R.P., Robbins, M.B., Rice, N.H., Faucett, R.C. & Lowen, J.C. (1997). An avifaunal survey of the vanishing interior Atlantic forest of San Rafael National Park, Departments Itapúa/Caazapá, Paraguay. *Cotinga* **7**: 45-53.

Maes, P., Meeus, H. & Voet, H. (1984). [Present breeding status of the Woodlark (*Lullula arborea*) in Flanders]. *Wielewaal* **50(6)**: 209-218.

Magrath, M.J.L. (1998). *Parental Care and Mating Behaviour of the Fairy Martin*. Petrochelidon ariel. PhD thesis, University of Melbourne, Melbourne.

Magrath, M.J.L. (1999). Breeding ecology of the Fairy Martin. *Austr. J. Zool.* **47(5)**: 463-477.

Magrath, M.J.L. & Elgar, M.A. (1997). Paternal care declines with increased opportunity for extra-pair matings in Fairy Martins. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **264**: 1731-1736.

Magrath, M.J.L., Green, D.J. & Komdeur, J. (2002). Sex allocation in the sexually monomorphic Fairy Martin. *J. Avian Biol.* **33**: 260-268.

Magyar, G., Hadarics, T., Waliczky, Z., Schmidt, A., Nagy, T. & Bankovics, A. (1998). *Magyarország Madarainak Névjegyzéke. An Annotated List of the Birds of Hungary*. In Hungarian and English. Coronet Books, Budapest.

Mahabal, A. & Lamba, B.S. (1987). *On the Birds of Poona and Vicinity*. Zoological Survey of India Miscellaneous Publication Occasional Paper **94**. Calcutta. 115 pp.

Maher, W.J. (1979). Nestling diet of prairie passerine birds at Matador, Saskatchewan, Canada. *Ibis* **121(4)**: 437-452.

Maher, W.J. (1980). Growth of the Horned Lark at Rankin Inlet, Northwest Territories. *Can. Field-Nat.* **94(4)**: 405-410.

Maijer, S. (2000). *Birds of Bolivia 2.0: Sounds and Photographs (CD-ROM)*. Bird Songs International, Westernieland, Netherlands.

Maillard, O. & Caballero, E. (2003). Nidificación del Gallito de la Roca (*Rupicola peruviana*) en el Valle de San Onofre, Cochabamba, Bolivia. *Orn. Neotropical* **14(2)**: 263-265.

Maillard, O. & Lindo, J.P. (1998). Lista preliminar de las aves del río Chané, Dpto. Santa Cruz. Pp. 118-119 in: Sagot & Guerrero (1998). (Panel discussion).

Maisels, F. & Cruickshank, A. (2000). New breeding records of African River Martin *Pseudochelidon eurystomina* and Rosy Bee-eater *Merops malimbicus* in Conkouati Reserve, Republic of Congo. *Bull. African Bird Club* **7(1)**: 48-49.

Majumdar, N. & Brahmachari, G.K. (1988). Major grassland types of India and their bird communities: a conservation perspective. Pp. 205-219 in: Goriup (1988b).

Majumdar, N., Roy, C.S., Ghosal, D.K., Dasgupta, J.M., Basuroy, S. & Datta, B.K. (1992). Aves. Pp. 171-418 in: Ghosh, A.K. ed. (1992). *Fauna of West Bengal*. Part 1. Mammalia, Aves, Wildlife Conservation. Zoological Survey of India, State Fauna Series **3**, Calcutta. 443 pp.

Makatsch, W. (1976). *Die Eier der Vögel Europas*. Vol. 2. Verlag J. Neumann-Neudamm, Melsungen, Berlin, Basel & Wien.

Male, B. (1995). Recovery action for threatened species - an Australian perspective. Pp. 204-208 in: Coulson, J. & Crockford, N.J. eds. (1995). *Bird Conservation: the Science and the Action*. Ibis **137(1)**(Supplement).

Mallet-Rodrigues, F. & Marinho, M.L. (2003). The avifauna of low elevations in the Serra dos Órgãos, Rio de Janeiro State, south-east Brazil. *Cotinga* **20**: 51-56.

Mallorquín, A. & Quevedo, A. (2002). Variaciones en la intensidad de exhibición y selección de perchas en un "lek" de *Manacus manacus*. *Bol. Soc. Antioqueña Orn.* **13(24-25)**: 5-11.

Malo de Molina, J.A. (2003a). Avión Zapador *Riparia riparia*. Pp. 380-381 in: Martí & del Moral (2003).

Malo de Molina, J.A. (2003b). Avión Roquero *Ptyonoprogne rupestris*. Pp. 382-383 in: Martí & del Moral (2003).

Mamani, M.G. (1998). Las aves del río Iténez, Dpto. Santa Cruz. Pp. 68-71 in: Sagot & Guerrero (1998).

Mancina, C.A. & Llanes, A. (1997). Indicios de depredación de huevos de *Hirundo fulva* (Passeriformes: Hirundinidae) por *Epicrates angulifer* (Serpentes: Boidae). *Pitirre* **10(3)**: 95.

Mannan, R.W. (1984). Habitat use by Hammond's Flycatcher in old-growth forests, northeastern Oregon. *Murrelet* **65**: 84-86.

Manrique, J. & Yanes, M. (1994a). Lesser Short-toed Lark *Calandrella rufescens*. Pp. 358-359 in: Tucker & Heath (1994).

Manrique, J. & Yanes, M. (1994b). Thekla Lark *Galerida theklae*. Pp. 362-363 in: Tucker & Heath (1994).

Manrique, J., Suárez, F. & Garza, V. (1990). La Alondra de Dupont en España. *Quercus* **57**: 6-11.

Maragliano, R.E. & Montalti, D. (1995). Extensión de la distribución del Benteveo Común, *Pitangus sulphuratus argentinus* Todd, 1952 (Aves, Tyrannidae) en Argentina. *Neotrópica* **41(105-106)**: 76.

Marantz, C.A. & Remsen, J.V. (1991). Seasonal distribution of the Slaty Elaenia, a little-known austral migrant of South America. *J. Field Orn.* **62**: 162-172.

Marceliano, M.L.V. (1982). Notas sobre o comportamento reproductivo de *Todirostrum maculatum* (Desmarest 1806). *Bol. Mus. Paraense Emílio Goeldi (Nova Sér.)* **115**: 1-21.

March, W.T. (1863). Notes on the birds of Jamaica. *Proc. Acad. Nat. Sci. Philadelphia* **15**: 283-305.

Marchant, J.H., Hudson, R., Carter, S.P. & Whittington, P. (1990). *Population Trends in British Breeding Birds*. British Trust for Ornithology, Tring, UK.

Marchant, S. (1942). Some birds of the Owerri Province, S. Nigeria. *Ibis* **Ser. 14, no. 6**: 137-196.

Marchant, S. (1958). The birds of the Santa Elena Peninsula, S.W. Ecuador. *Ibis* **100(3)**: 349-387.

Marchant, S. (1960). The breeding of some s.w. Ecuadorian birds. *Ibis* **102(3)**: 349-382.

Marchant, S. (1963). The breeding of some Iraqi birds. *Ibis* **105(4)**: 516-557.

Marchant, S. & Fullagar, P.J. (1983). Nest records of the Welcome Swallow. *Emu* **83(2)**: 66-74.

Marcondes, L.O. (2002). Comportamento alimentar de aves em *Miconia rubiginosa* (Melastomataceae) em fragmento de Cerrado, São Paulo. *Iheringia (Ser. Zool.)* **92**: 97-100.

Marechal, P. (1987). [Crested Lark chases away kestrel]. *Vogeljaar* **35(1)**: 43.

Marelli, C.A. (1919). Sobre el contenido del estómago de algunas aves. *Hornero* **1**: 221-228.

Marín, M. (2004). *Lista Comentada de las Aves de Chile. Annotated Checklist of the Birds of Chile*. Lynx Edicions, Barcelona. In English and Spanish.

Marín, M., Kiff, L.F. & Peña, L. (1989). Notes on Chilean Birds, with descriptions of two new subspecies. *Bull. Brit. Orn. Club* **109(2)**: 66-82.

Marini, M.Â. (1989). *Seleção de Habitat e Socialidade em* Antilophia galeata *(Aves: Pipridae)*. MSc thesis, Universidade de Brasília, Brasília.

Marini, M.Â. (1992a). Foraging behavior and diet of the Helmeted Manakin. *Condor* **94(1)**: 151-158.

Marini, M.Â. (1992b). Notes on the breeding and reproductive biology of the Helmeted Manakin. *Wilson Bull.* **104(1)**: 168-173.

Marini, M.Â. ed. (1997). *VI Congresso Brasileiro de Ornitologia*. Belo Horizonte, Brazil.

Marini, M.Â. & Cavalcanti, R.B. (1990). Migration of *Elaenia albiceps chilensis* and *Elaenia chiriquensis albivertex* (Aves: Tyrannidae). *Bol. Mus. Paraense Emílio Goeldi (Zool.)* **6**:: 59-68.

Marini, M.Â. & Cavalcanti, R.B. (1992). Mating system of the Helmeted Manakin (*Antilophia galeata*) in central Brazil. *Auk* **109(4)**: 911-913.

Marini, M.Â. & Cavalcanti, R.B. (1998). Frugivory by *Elaenia* flycatchers. *Hornero* **15(1)**: 47-50.

Marini, M.Â. & Hackett, S.J. (2002). A multifaceted approach to the characterization of an intergeneric hybrid manakin (Pipridae) from Brazil. *Auk* **119(4)**: 1114-1120.

Marini, M.Â., Motta, J.C., Vasconcellos, L.A.S. & Cavalcanti, R.B. (1997). Avian body masses from the cerrado region of central Brazil. *Orn. Neotropical* **8**: 93-99.

Marini, M.Â., Pereira, M. de F., de Oliveira, G.M. & de Melo, C. (1997). Novos registros de ninhos e ovos de três espécies de aves do Brasil Central. *Ararajuba* **5(2)**: 244-245.

van Marle, J.G. & Voous, K.H. (1988). *The Birds of Sumatra. An Annotated Check-list*. BOU Check-list **10**. British Ornithologists' Union, Tring, UK.

Marques, R.V. & Alves, M.A.S. (2000). Riqueza e abundância de aves na Lagoa Rodrigo de Freitas, Rio de Janeiro: o efeito da pluviosidade. Pp. 258-259 in: Straube *et al.* (2000). (Abstract).

Marr, T. & Porter, R. (1995). The White-winged Lark in Britain. *British Birds* **88(8)**: 365-371.

Marsh, M. & Odin, N. (1994). The Blyth's Pipit in Suffolk. *Birding World* **7**: 473-475.

Marsh, R.L. (1979). Development of endothermy in nestling Bank Swallows (*Riparia riparia*). *Physiol. Zool.* **52**: 340-353.

Marsh, R.L. (1980). Development of temperature regulation in nestling Tree Swallows, *Iridoprocne bicolor*. *Condor* **82(4)**: 461-463.

Marsh, R.L. & Wickler, S.J. (1982). The role of muscle development in the transition to endothermy in nestling Bank Swallows. *J. Comp. Physiol.* **149**: 99-105.

Marshall, A.J. & Williams, M.C. (1959). The pre-nuptial migration of the Yellow Wagtail (*Motacilla flava*) from latitude 0.04'N. *Proc. Zool. Soc. London* **1959**: 313-320.

Marshall, J.T. (1943). Additional information concerning the birds of El Salvador. *Condor* **45(1)**: 21-33.

Martens, J. & Eck, S. (1995). *Towards an Ornithology of the Himalayas: Systematics, Ecology, and Vocalizations of Nepal Birds*. Bonner Zoologische Monographien **38**. Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn. 445 pp.

Marti, C. & Breitenmoser-Würsten, C. (1990). Brutbiologie der Bergstelze *Motacilla cinerea* im Saaneland im Vergleich zu jenr der Wasseramsel *Cinclus cinclus*. *Orn. Beob.* **87**: 13-29.

Marti, C. & Breitenmoser-Würsten, C. (1991). Nestingsnahrung and Fütterungsfrequenz der Bergstelz *Motacilla cinerea* im Saaneland. [Nestling diet and feeding frequency of Grey Wagtails *Motacilla cinerea* in the Saaneland (Bernese Oberland)]. *Orn. Beob.* **88(3)**: 265-288. In German with English summary.

Martí, R. & del Moral, J.C. (2003). *Atlas de las Aves Reproductoras de España*. Dirección General de Conservación de la Naturaleza & SEO/BirdLife, Madrid.

Martín, A. (1987). *Atlas de las Aves Nidificantes en la Isla de Tenerife*. Instituto de Estudios Canarios, Tenerife, Spain.

Martín, A. & Lorenzo, J.A. (2001). *Aves del Archipiélago Canario*. Francisco Lemus Editor, La Laguna.

Martin, C. (1998). Stalking the wild American Pipit. *New Hampshire Audubon* **34(6)**: 5-6, 14.

Martin, H. & Pepler, D. (1997). Rock Pipits in the Bavianhoek Mountains, Karoopoort. *Promerops* **231**: 9.

Martin, J. (1972). The nest of the Dusky Lark. *Bokmakierie* **24(1)**: 3.

Martin, J. (2001). Vorkommen der Felsenschwalbe *Ptyonoprogne rupestris* in Kanton Glarus. *Orn. Beob.* **98**: 71-73.

Martin, J. & Broekhuysen, G.J. (1961). Some records of birds using nests of others. *Ostrich* **32**: 104-106.

Martin, J.A. & Morrison, M.L. (1998). Distribution, abundance, and habitat characteristics of the Buff-breasted Flycatcher. Page 160 in: Anon. (1998b). (Abstract).

Martin, J.A. & Morrison, M.L. (1999). Distribution, abundance, and habitat characteristics of the Buff-breasted Flycatcher in Arizona. *Condor* **101(2)**: 272-281.

Martin, P.A. & Forsyth, D.J. (2003). Occurrence and productivity of songbirds in prairie farmland under conventional versus minimum tillage regimes. *Agric. Ecosyst. & Environm.* **86**: 1-11.

Martin, P.R. (1994). *Effects of Forest Management Practices and Forest-cutting History on the Songbird Communities of Mature Hardwood Forest Stands, Lake Opinicon, Leeds/Frontenac Cos., Ontario*. Ontario Ministry Natural Resources, Brockville, Ontario.

Martin, R. (1992). Longbilled Pipits in burnt fynbos. *Promerops* **203**: 13.

Martin, R. & Pepler, D. (1997a). Greater Striped Swallows feeding in the intertidal zone. *Promerops* **231**: 8.

Martin, R. & Pepler, D. (1997b). Black Sawwing Swallows collecting nest material. *Promerops* **231**: 11.

Martin, R. & Pepler, D. (1999). Rock Pipits in MontEco. *Promerops* **240**: 15.

Martin, R. & Pepler, D. (2001). Brown-throated Martins feeding in the intertidal zone. *Promerops* **247**: 19.

Martin, R., Martin, J. & Martin, E. (1985). Red Data Book species in the Karoo National Park. *Promerops* **170**: 12.

Martin, R.F. (1974). Syntopic culvert nesting of Cave and Barn Swallows in Texas. *Auk* **91**: 776-782.

Martin, R.F. (1980). Analysis of hybridization between the hirundinid genera *Hirundo* and *Petrochelidon* in Texas. *Auk* **97**: 148-159.

Martin, R.F. (1981). Reproductive correlates of environmental variation and niche expansion in the Cave Swallow in Texas. *Wilson Bull.* **93**: 506-518.

Martin, R.F. (1982). Proximate ecology and mechanics of intergeneric swallow hybridization (*Hirundo rustica* x *Petrochelidon fulva*). *Southwest. Nat.* **27**: 218-220.

Martin, R.F. (1983). Biology of the Cave Swallow in Texas. *Natl. Geogr. Soc. Res. Rep.* **15**: 417-439.

Martin, R.F. & Héctor, D. (1988). Nest lining with sheep wool: potential negative effects on Cave Swallow. *Wilson Bull.* **100**: 294-296.

Martin, R.F. & Martin, S.R. (1978). Niche and range expansion of Cave Swallows in Texas. *Amer. Birds* **32**: 941-946.

Martin, R.F. & Selander, R.K. (1975). Morphological and biochemical evidence of hybridization between Cave and Barn Swallows. *Condor* **77(3)**: 362-364.

Martin, R.F., Martin, M.W. & Lanier-Martin, R.G. (1986). Geographic variation in white facial markings of juvenile Cave Swallows. *Southwest. Nat.* **31**: 402-403.

Martin, R.F., Miller, G.O., Lewis, M.R., Martin, S.R. & Davis, W.R. (1977). Reproduction of the Cave Swallow: a Texas cave population. *Southwest. Nat.* **22**: 177-186.

Martin, T.E. & Finch, D.M. eds. (1995). *Ecology and Management of Neotropical Migratory Birds. A Synthesis and Review of Critical Issues*. Oxford University Press, Oxford & New York.

Martin, T.E. & Li, P. (1992). Life history traits of open- vs. cavitynesting birds. *Ecology* **73**: 579–592.

Martin, T.E., Møller, A.P., Merino, S. & Clobert, J. (2001). Does clutch size evolve in response to parasites and immunocompetence? *Proc. Natl. Acad. Sci. USA* **98**: 2071-2076.

Martín-Vivaldi, M., Marín, J.M., Archila, F., López, E. & de Manuel, L.C. (1999). Caracterización de una nueva población reproductora de Alondra de Dupont (*Chersophilus duponti*) (Passeriformes, Alaudidae) en el sureste ibérico. *Zool. Baetica* **10**: 185-192.

Martínez, M.J. (2003). Bisbita Campestre *Anthus campestris*. Pp. 390-391 in: Martí & del Moral (2003).

Martínez, M.M. (1983). Nidificación de *Hirundo rustica erythrogaster* (Boddaert) en la Argentina (Aves, Hirundinidae). *Neotrópica* **29(81)**: 83-86.

Mason, C.F. & Lyczynski, F. (1980). Breeding biology of the Pied and Yellow Wagtails. *Bird Study* **27**: 1-10.

Mason, E.A. (1953). Barn Swallow life history data based on banding records. *Bird-Banding* **24**: 91-100.

Mason, K.C. (1986). *The Superb Lyrebird*. Sir Colin Mackenzie Zoological Park, Healesville, Victoria.

Mason, K.C. (1987). The Superb Lyrebird. *Thylacinus* **12(2)**: 2-7.

Mason, K.C. (1999). Captive husbandry of the Superb Lyrebird. *Thylacinus* **23(1)**: 2-11.

Mason, P. (1985). The nesting biology of some passerines of Buenos Aires, Argentina. Pp. 954-972 in: Buckley *et al.* (1985).

Masterson, A.N.B. & Child, G.F.T. (1959). Ornithological notes on an expedition to the Chimanimani Mountains. *Ostrich* **30**: 22-32.

Masterson, A.N.B. & Parkes, D.A. (1993). Melodious Larks breeding near Felixburg. *Honeyguide* **39(4)**: 189-192.

Mathews, G.M. (1930). *Systema Avium Australasianarum. A Systematic List of the Birds of the Australasian Region*. Taylor & Francis, London.

Matyjasiak, P. & Jablonski, P.G. (2001). Hypothetical mechanisms of the initial evolution of sexually dimorphic tail streamers in Hirundinidae. *Evolution* **55(2)**: 446-448.

Mauersberger, G. (1982). Allgemeiner Bericht über eine ornithologische Gemeinschaftsreise in die Mongolei (30. V. bis 13. VI. 1979). *Mitt. Zool. Mus. Berlin* **58**: 3–10.

Mauersberger, G., Wagner, S., Wallschläger, D. & Warthold, R. (1982). Neue Daten zur Avifauna Mongolica. *Mitt. Zool. Mus. Berlin* **58(1)**: 11-74.

Maumary, L. & Baudraz, M. (2000). Seltene Vogelarten und ungewöhnliche Vogelbeobachtungen in der Schweiz im Jahre 1999. [Rare and unusual bird observations in Switzerland in 1999]. *Orn. Beob.* **97(4)**: 307-333. In German with English summary.

Mautsch, H. (1981). Beobachtungen am Nest der Kalanderlerche in der bulgarischen Dobrudscha. *Falke* **28(3)**: 86-88.

Mayaud, N. (1951). Comportement et adaptation chez l'Hirondelle de rochers *Hirundo* (*Ptyonoprogne*) *rupestris* Scopoli. *Alauda* **17&18(2)**: 118-119.

Mayaud, N. (1960). Notes de systématique saharienne. *Alauda* **38(3)**: 188-195.

Mayaud, N. (1985). Les oiseaux du nord-ouest de l'Afrique. Notes complementaires. *Alauda* **53(3)**: 186-208.

Mayaud, N. (1986). Les oiseaux du nord-ouest de l'Afrique. Notes complémentaires. *Alauda* **54(4)**: 213-229.

Mayer, G.T. (1995). Die Haubenlerche (*Galerida cristata*) in Oberösterreich. Einwanderung - Verbreitung - Rückzug. [The Crested Lark (*Galerida cristata*) in upper Austria. Immigration, distribution and decline]. *Jahr. Oberoest. Mus. Ges. Landesk.* **140(1)**: 395-419.

Mayhew, W.W. (1958). The biology of the Cliff Swallow in California. *Condor* **60(1)**: 7-37.

Mayhew, W.W. (1963). Homing of Bank Swallows and Cliff Swallows. *Bird-Banding* **34**: 179-190.

Maynard, E. & Waterton, R. (1998). An Oxford University expedition to the high altitude *Polylepis* forests of the Cordillera Huayhuash, central Peru. Unpublished report to Oxford University.

Mayr, E. (1941). *List of New Guinea Birds. A Systematic and Faunal List of the Birds of New Guinea and Adjacent Islands*. American Museum of Natural History, New York.

Mayr, E. (1944). The birds of Timor and Sumba. *Bull. Amer. Mus. Nat. Hist.* **83(2)**: 123-194.

Mayr, E. (1945). *Birds of the Southwest Pacific*. Macmillan, New York.

Mayr, E. (1955). Notes on the birds of northern Melanesia 3. Passeres. *Amer. Mus. Novit.* **1707**: 1-46.

Mayr, E. (1971). New species of birds described from 1956 to 1965. *J. Orn.* **112**: 302-316.
Mayr, E. & Bond, J. (1943). Notes on the generic classification of the swallows, Hirundinidae. *Ibis* **85(3)**: 334-341.
Mayr, E. & Diamond, J. (2001). *The Birds of Northern Melanesia. Speciation, Ecology, and Biogeography*. Oxford University Press, Oxford.
Mayr, E. & Greenway, J.C. eds. (1960). *Check-list of Birds of the World: a Continuation of the Work of James L. Peters*. Vol. 9. Museum of Comparative Zoology, Harvard University Press, Cambridge, Massachusetts.
Mayr, E. & McEvey, A. (1960). The distribution and variation of *Mirafra javanica* in Australia. *Emu* **60**: 155–192.
Mayr, E. & Phelps, W.H. (1967). The origin of the bird fauna of the south Venezuelan highlands. *Bull. Amer. Mus. Nat. Hist.* **136(5)**: 269-328.
Mayr, E. & Rand, A.L. (1937). *Results of the Archbold Expeditions. 14. Birds of the 1933-1934 Papuan Expedition*. Bulletin of the American Museum of Natural History **73**, New York. 248 pp.
Mayr, E. & Short, L.L. (1970). *Species Taxa of North American Birds. A Contribution to Comparative Systematics*. Publications of the Nuttall Ornithological Club **9**, Cambridge, Massachusetts. 127 pp.
Mazar Barnett, J. & Kirwan, G.M. (1998a). Neotropical Notebook. Guyana. *Cotinga* **10**: 104.
Mazar Barnett, J. & Kirwan, G.M. (1998b). Neotropical Notebook. Colombia. *Cotinga* **11**: 102.
Mazar Barnett, J. & Kirwan, G.M. (1998c). Neotropical notebook. Brazil. *Cotinga* **10**: 104.
Mazar Barnett, J. & Kirwan, G.M. (2001). Neotropical Notebook. Brazil. *Cotinga* **15**: 69.
Mazar Barnett, J. & Kirwan, G.M. (2002a). Neotropical Notebook. Brazil. *Cotinga* **17**: 84.
Mazar Barnett, J. & Kirwan, G.M. (2002b). Neotropical Notebook. Colombia. *Cotinga* **17**: 84.
Mazar Barnett, J. & Pearman, M. (2001). *Lista Comentada de las Aves Argentinas. Annotated Checklist of the Birds of Argentina*. Lynx Edicions, Barcelona. In Spanish and English.
Mazar Barnett, J., Clark, R., Bodrati, A., Bodrati, G., Pugnali, G. & della Seta, M. (1998). Natural history notes on some little-known birds in north-west Argentina. *Cotinga* **9**: 64-75.
Mazar Barnett, J., Kirwan, G.M., Pearman, M., Naka, L.N. & Tobias, J.A. (2000). Rediscovery and subsequent observations of Kaempfer's Tody-tyrant *Hemitriccus kaempferi* in Santa Catarina, Brazil, with notes on conservation, life history and plumage. *Bird Conserv. Int.* **10(4)**: 371-379.
Mazar Barnett, J., Kirwan, G.M. & Tobias, J.A. (1998a). Neotropical Notebook. Bolivia. *Cotinga* **9**: 86-87.
Mazar Barnett, J., Kirwan, G.M. & Tobias, J.A. (1998b). Neotropical Notebook. Brazil. *Cotinga* **9**: 87-90.
Mazar Barnett, J., Kirwan, G.M. & Williams, R.S.R. (1997). Neotropical notebook. Brazil. *Cotinga* **8**: 95.
McAllan, I.A.W. & Bruce, M.D. (1989). *The Birds of New South Wales. A Working List*. Biocon Research Group, Turramurra, Australia.
McAllister, J. (1990). Various breeding records. *Witwatersrand Bird Club News* **150**: 18-20.
McAllister, J. (1994). Breeding records - Wakkerstroom. *Witwatersrand Bird Club News* **164**: 21.
McAtee, W.L. (1905). The Horned Larks and their relation to agriculture. *US Dept. Agriculture Biol. Surv. Bull.* **23**: 1-37.
McCabe, R.A. (1951). The song and song-flight of the Alder Flycatcher. *Wilson Bull.* **63**: 89-98.
McCandless, J. (1958). *A Field Guide to the Birds of Puerto Rico*. San Germán, Puerto Rico.
McCartney, S. (1994). Can Blue Swallows be managed? *Birding in SA* **46**: 98.
McCarty, J.P. (1996). The energetic cost of begging in nestling passerines. *Auk* **113(1)**: 178-188.
McCarty, J.P. (1996b). Eastern Wood-pewee (*Contopus virens*). No. **245** in: Poole, A.F. & Gill, F.B. eds. (1996). *The Birds of North America*. Vol. 7. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
McCarty, J.P. (1997). Aquatic community characteristics influence the foraging patterns of Tree Swallows. *Condor* **99(1)**: 210-213.
McCarty, J.P. (2001). Variation in growth of nestling Tree Swallows across multiple temporal and spatial scales. *Auk* **118(1)**: 176-190.
McCarty, J.P. & Secord, A.L. (1999a). Reproductive ecology of Tree Swallows (*Tachycineta bicolor*) with high levels of polychlorinated biphenyl contamination. *Environm. Toxicol. Chem.* **18**: 1433-1439.
McCarty, J.P. & Secord, A.L. (1999b). Nest-building behavior in PCB-contaminated Tree Swallows. *Auk* **116(1)**: 55-63.
McCarty, J.P. & Winkler, D.W. (1999a). Foraging ecology and diet selectivity of Tree Swallows feeding nestlings. *Condor* **101(2)**: 246-254.
McCarty, J.P. & Winkler, D.W. (1999b). Relative importance of environmental variables in determining the growth of nestling Tree Swallows *Tachycineta bicolor*. *Ibis* **141(2)**: 286-296.
McCleland, W. (1987). Nesting Plainbacked Pipit. *Bee-eater* **38(4)**: 55.
McClure, H.E. (1998). *Migration and Survival of the Birds of Asia*. White Lotus Press, Bangkok.
McDonald, D.B. (1987). *Male-Male Cooperation in a Neotropical Lekking Bird*. PhD thesis, University of Arizona, Tucson, Arizona.
McDonald, D.B. (1989a). Correlates of male mating success in a lekking bird with male-male cooperation. *Anim. Behav.* **37(6)**: 1007-1032.
McDonald, D.B. (1989b). Cooperation under sexual selection: age-graded changes in a lekking bird. *Amer. Naturalist* **134(5)**: 709-730.
McDonald, D.B. (1993a). Demographic consequences of sexual selection in the Long-tailed Manakin. *Behav. Ecol.* **4(4)**: 297-309.
McDonald, D.B. (1993b). Delayed plumage maturation and orderly queues for status: a manakin mannequin experiment. *Ethology* **94(1)**: 31-45.
McDonald, D.B. (2003). Microsatellite DNA evidence for gene flow in Neotropical lek-mating Long-tailed Manakins. *Condor* **105(3)**: 580-586.
McDonald, D.B. & Potts, W.K. (1994). Cooperative display and relatedness among males in a lek-mating bird. *Science* **266(5187)**: 1030-1032.
McDonald, D.B., Clay, R.P., Brumfield, R.T. & Braun, M.J. (2001). Sexual selection on plumage and behavior in an avian hybrid zone: experimental tests of male-male interactions. *Evolution* **55(7)**: 1443-1451.
McDonald, K. (1974). Observations at the nest of a Richard's Pipit. *Bokmakierie* **26(1)**: 14.
McFarlane, R.W. (1963). The taxonomic significance of avian sperm. Pp. 91-102 in: Sibley (1963).
McGill, L. (1992). Aggressive Pied Wagtail. *Bee-eater* **42(4)**: 65.
McGillivray, W.B. & Levenson, H. (1986). Distribution of food within broods of Barn Swallows. *Wilson Bull.* **98**: 286-291.
McGinn, D.B. & Clark, H. (1978). Some measurements of swallow breeding biology in lowland Scotland. *Bird Study* **25**: 109-118.
McGowan, K.J. & Spahn, R. (2004). A probable Couch's Kingbird x Scissor-tailed Flycatcher in Livingston Co., New York. *Kingbird* **54(1)**.
McGregor, R.C. (1905). I. Birds from Mindoro and small adjacent islands. II. Notes on three rare Luzon birds. *Dept. Interior, Bureau Gov. Lab.* **34**: 1-31.
McIntosh, E. & Walton, D.W.H. (2000). *Environmental Management Plan for South Georgia*. British Antarctic Survey & Government of South Georgia & the South Sandwich Islands, Cambridge, UK.
McKee, T. & Erickson, R.A. (2002). Report of the California Bird Records Committee: 2000 records. *Western Birds* **33**: 175-201.
McKitrick, M.C. (1985). Monophyly of the Tyrannidae (Aves): comparison of morphology and DNA. *Syst. Zool.* **34(1)**: 35-45.
McKitrick, M.C. (1990). Genetic evidence for multiple parentage in Eastern Kingbirds (*Tyrannus tyrannus*). *Behav. Ecol. Sociobiol.* **26**: 149-155.
McKitrick, M.C. (1993). Trends in the evolution of hindlimb musculature in aerial-foraging birds. *Auk* **110**: 189-206.
McKnight, D. & McKnight, B. (1991). Welcome Swallows operating electronic doors. *Austr. Bird Watcher* **14(3)**: 81.
McLean, S. (1988). Lesser Striped Swallows feeding on fruit. *Bokmakierie* **40(1)**: 21.
McLellan, M.E. (1938). On some birds rare in, hitherto unrecorded from, Chiriqui Province, Panama. *Proc. Calif. Acad. Sci. (Ser. 4)* **17**: 255-261.
McMahon, A. (1997). The lyrebirds from the gullies. *Bird Obs.* **777**: 9-10.
McNabb, E.G. (1982). Ring-tailed possum's nest destroyed by a Superb Lyrebird. *Austr. Bird Watcher* **9(8)**: 268.
McNair, D.B. (1998). Sprague's Pipit overwinters at Apalachicola, Franklin County, and an assessment of its winter status in Florida and nearby states. *Florida Field Nat.* **26(1)**: 21-23.
McNair, D.B. & Post, W. (1999). First specimen record of the Cave Swallow *Petrochelidon fulva pelodoma* in eastern North America. *Chat* **63**: 30-32.
McNeil, D.A.C. & Clark, F. (1987). Markings on the eggs of House Martins *Delichon urbica*. *Bird Study* **34**: 26-27.
McNeil, R. (1982). Winter resident repeats and returns of austral and boreal migrant birds banded in Venezuela. *J. Field Orn.* **53**: 125-132.
McNeil, R. & Martínez, A. (1968). Notes on the nesting of the Short-tailed Pygmy-Tyrant (*Myiornis ecaudatus*) in northeastern Venezuela. *Condor* **70(2)**: 181-182.
McNicholl, M.K. (1988). Ecological and human influences on Canadian populations of grassland birds. Pp. 1-25 in: Goriup (1988b).
McOrist, S. & Scott, P.C. (1989). Parasitic enteritis in Superb Lyrebirds (*Menura novaehollandiae*). *J. Wildl. Diseases* **25(3)**: 420-421.
McWhirter, D.W. (1988). Sight records of four bird species from the Philippines. *Jap. J. Orn.* **37(2)**: 83-84. In English with Japanese summary.
Mead, C.J. (1970). Winter quarters of British Swallows. *Bird Study* **17**: 229-240.
Mead, C.J. (1972). A change in the winter quarters of British swallows (*Hirundo rustica*). Pp. 667-668 in: Voous (1972). (Abstract).
Mead, C.J. (1979a). Colony fidelity and interchange in the Sand Martin. *Bird Study* **26**: 99-106.
Mead, C.J. (1979b). Mortality and causes of death in British Sand Martins. *Bird Study* **26**: 107-112.
Mead, C.J. (1994). San Martin *Riparia riparia*. Pp. 368-369 in: Tucker & Heath (1994).
Mead, C.J. & Harrison, J.D. (1979a). Sand Martin movements within Britain and Ireland. *Bird Study* **26**: 73-86.
Mead, C.J. & Harrison, J.D. (1979b). Overseas movements of British and Irish Sand Martins. *Bird Study* **26**: 87-98.
Meadows, B.S. & Symens, P. (1996). The first Woodlark *Lullula arborea* in Saudi Arabia. *Sandgrouse* **18(1)**: 66-67.
Medland, R.D. (1985). South Africa Cliff Swallow *Hirundo spilodera* in Malawi. *Nyala* **11(1)**: 26-27.
Medland, R.D. (1988). Mascarene Martin, *Phedina borbonica*, near Chiromo. *Nyala* **12(1/2)**: 73.
Medland, R.D. (1989a). Movement of Pearl-breasted Swallow. *Vocifer* **12**: 10-11.
Medland, R.D. (1989b). The White-throated Swallow in Malawi. *Nyala* **14(2)**: 125-127.
Medland, R.D. (1989c). White-throated Swallow *Hirundo albigularis* in Malawi II. *Vocifer* **9**: 6-8.
Medland, R.D. (1992a). Movement of Pearl-breasted Swallow. *Nyala* **16(1)**: 27.
Medland, R.D. (1992b). Juvenile Wiretailed Swallows in Malawi: mensural and moult data and observations on use of parental nest-roost. *Safring News* **21(1)**: 11-13.
Medland, R.D. (1992c). Yellow-throated Longclaw's frog-in-the-throat. *Nyala* **16(1)**: 27.
Medland, R.D. (1995). Further extension of range of Fischer's Finchlark. *Nyala* **18**: 48-49.
Medland, R.D. & Karcher, F. (1990). Range extension of Rosy-breasted Longclaw. *Nyala* **14**: 123-124.
Medvin, M.B. & Beecher, M.D. (1986). Parent-offspring recognition in the Barn Swallow (*Hirundo rustica*). *Anim. Behav.* **34**: 1627-1639.
Medvin, M.B., Beecher, M.D. & Andelman, S.J. (1987). Extra adults at the nest in Barn Swallows. *Condor* **89(1)**: 179-182.
Medvin, M.B., Stoddard, P.K. & Beecher, M.D. (1992). Signals for parent-offspring recognition: strong sib-sib call similarity in Cliff Swallows but not Barn Swallows. *Ethology* **90**: 17-28.
Medvin, M.B., Stoddard, P.K. & Beecher, M.D. (1993). Signals for parent-offspring recognition: a comparative analysis of the begging calls of Cliff Swallows and Barn Swallows. *Anim. Behav.* **45**: 841-850.
Medway, D.G. (1976). Extant types of New Zealand birds from Cook's voyages. Part 1. Historical, and the Type Paintings. *Notornis* **23(1)**: 44-60.
Medway, Lord (1973). A ringing study of migratory Barn Swallows in west Malaysia. *Ibis* **115(1)**: 60-86.
Medway, Lord & Wells, D.R. (1976). *The Birds of the Malay Peninsula*. Vol. 5. Conclusions and Survey of Every Species. Witherby & Penerbit University Malaya, London & Kuala Lumpur.
Mee, A., Ohlson, J., Stewart, I., Wilson, M., Örn, P. & Díaz, J. (2002). The Cerros del Sira revisited: birds of submontane and montane forest. *Cotinga* **18**: 46-57.
Meehan, T.D. & George, T.L. (2003). Short-term effects of moderate- to high-severity wildfire on a disturbance-dependent flycatcher in northwest California. *Auk* **120(4)**: 1102-1113. In English with Spanish summary.
Meek, S.B. & Barclay, R.M.R. (1996). Settlement patterns and nest-site selection of Cliff Swallows. *Hirundo pyrrhonota*: males prefer to clump but females settle randomly. *Can. J. Zool.* **74(8)**: 1394-1401.
Mees, G.F. (1962). Larks, *Mirafra javanica*, of tropical western Australia. *J. Roy. Soc. West. Aust.* **45**: 44–50.
Mees, G.F. (1965). The avifauna of Misool. *Nova Guinea, Zool.* **31**: 139-203.
Mees, G.F. (1968). Enige voor de avifauna van Suriname Nieuw Vogelsoorten. *Gerfaut* **58**: 101-107.
Mees, G.F. (1982). *Birds from the Lowlands of Southern New Guinea (Merauke and Koembe)*. Zoologische Verhandelingen **191**. Rijksmuseum van Natuurlijke Historie, Leiden. 188 pp.
Mees, G.F. (1985). Nomenclature and systematics of birds from Suriname. *Proc. K. Ned. Akad. Wet. (Ser. C Biol. Med. Sci.)* **88**: 75-91.
Mees, G.F. (1996). *Geographical Variation in Birds of Java*. Publications of the Nuttall Ornithological Club **26**, Cambridge, Massachusetts. 119 pp.
Mees, G.F. (2000). *Birds of the Rupununi South Savannah, Guyana*. Published privately, Busselton, Western Australia.
Meeus, H. (1982). [Population census of breeding pairs of the Woodlark *Lullula arborea* in the Turnhout Kempen]. *Wielewaal* **48(1)**: 43-47.
Meinertzhagen, R. (1930). *Nicholl's Birds of Egypt*. Hugh Rees Ltd, London.
Meinertzhagen, R. (1951). A review of the Alaudidae. *Proc. Zool. Soc. London* **121(1)**: 81–132.
Meinertzhagen, R. (1954a). *Birds of Arabia*. Oliver & Boyd, Edinburgh and London.
Meinertzhagen, R. (1954b). Possible occurrence of the American Horned Lark *Eremophila alpestris alpestris* in Britain. *Bull. Brit. Orn. Club* **74**: 103.
Meise, W. (1949). Über einen Gattungsbastard und eine Zwillingsart der Tyrannen nebst Bemerkungen über Zugweite und Flügelform. Pp. 61-83 in: Mayr, E. & Schüz, E. eds. (1949). *Ornithologie als Biologische Wissenschaft*. Winter, Heidelberg.
Meise, W. (1954). Notes on flat-bills of the genus *Platyrinchus* (Tyrannidae). *Auk* **71**: 285-292.
Mello, M.C. & Piratelli, A.J. (1997). Biologia e ecologia do Uirapuru-laranja (*Pipra fasciicauda*, Aves, Pipridae). [Biology and ecology of the Band-tailed Manakin (*Pipra fasciicauda*, Aves, Pipridae)]. Page 199 in: Marini (1997). (Abstract). In Portuguese.
Mellor, J.W. (1967). Notes on swallows and martins. *South Austr. Orn.* **10**: 204-208.
Melville, D.S. (1996). Richard's Pipit eating bread. *Hong Kong Bird Rep.* **1996**: 251-252.
Mena, P. & Jahn, O. (2002). Sapayoa. *Sapayoa aenigma*. Pp. 322-323 in: Granizo (2002).
Mendelsohn, J. (1984a). The Mountain Pipit in the Drakensberg. *Bokmakierie* **36(2)**: 40-44.
Mendelsohn, J. (1984b). Identification of Mountain Pipits. *Albatross* **276**: 7.
Mendelsohn, J., Robson, N. & Horner, R. (1988). Birds of the Bangazi Plain, northern Zululand. *Bokmakierie* **40(3)**: 81-84.
Mendes de Azevedo, S., do Nascimento, J.L.X. & do Nascimento, I.S. (2000). Novos registros de ocorrência de *Antilophia bokermanni* Coelho & Silva, 1999 na Chapada do Araripe, Brasil. *Ararajuba* **8(2)**: 133-134.
Mendoça, E.C. & Gonzaga, L.P. (2000). Nidificação de *Iodopleura pipra* (Cotingidae) em Angra dos Reis, Rio de Janeiro. Pp. 172-173 in: Straube *et al.* (2000). (Abstract).
Mengel, R.M. (1965). *The Birds of Kentucky*. Ornithological Monographs **3**. American Ornithologists' Union, Washington, D.C.
Mengelkoch, J.M., Niem, G.J. & Regal, R.R. (2004). Diet of the nestling Tree Swallow. *Condor* **106(2)**: 422-429.
Menzel, H. (1984). *Die Mehlschwalbe*. Ziemsen, Wittenberg Lutherstadt.
Merino, S., Martínez, J., Møller, A.P., Barbosa, A., de Lope, F. & Rodríguez-Caabeiro, F. (2001). Physiological and hematological consequences of a novel parasite on the Red-rumped Swallow *Hirundo daurica*. *Int. J. Parasitol.* **31**: 1187-1193.
Merino, S., Møller, A.P. & de Lope, F. (2000). Seasonal changes in cell-mediated immunocompetence and mass gain in nestling Barn Swallows: a parasite-mediated effect? *Oikos* **90**: 327-332.
Merizalde, C. (1975). Reproducción de cinco especies de aves del occidente del Ecuador. *Rev. Univ. Catol.* **3(8)**: 167-183.
Merton, D.V. (1970). Kermadec Islands expedition reports: a general account of birdlife. *Notornis* **17(3)**: 147-199.
van der Merwe, F. (1986). Banded Sand Martins in the southwestern Cape. *Promerops* **175**: 9.
Meschini, E. & Frugis, S. (1993). *Atlante degli Ucelli Nidificanti in Italia*. Ricerche di Biologia della Selvaggina **20**(Supplement). 344 pp.
Meservey, W.R. & Kraus, G.F. (1976). Absence of "individual distance" in three swallow species. *Auk* **93**: 177-178.
Messlinger, U. (1999). [Effects of landscape conservation measures on the Woodlark population of Lower Franconian dry grass areas]. *Schrift. Bayerisch. Landes. Umweltsch.* **150**: 203-217.
Meury, R. (1989a). [Population density and home-range of the Tree Pipit *Anthus trivialis* in the lower Reuss Valley, in a landscape with a patchy habitat distribution]. *Orn. Beob.* **86(2)**: 105-135. In German with English summary.
Meury, R. (1989b). [Breeding biology and site fidelity in the Tree Pipit *Anthus trivialis* in a landscape with a patchy habitat distribution in the Swiss lowlands]. *Orn. Beob.* **86(3)**: 219-233. In German with English summary.
Meury, R. (1990). Breeding biology and site fidelity in the Tree Pipit *Anthus trivialis* in a patchily distributed habitat in the Swiss lowlands. *J. Field Orn.* **61(2)**: 260.
Meury, R. (1991). [Feeding ecology of the Tree Pipit *Anthus trivialis* in farmland of the Swiss lowlands]. *Orn. Beob.* **88(1)**: 57-72. In German with English summary.

Mey, E. (1988). Herbstdaten zur mongolischen Avifauna. *Mitt. Zool. Mus. Berlin* **64**(Suppl.): *Ann. Orn.* **12**: 79-128.
Meyer, D. (1982). Das Vorkommen von Haubenlerche (*Galerida cristata*) und Hausrotschwanz (*Phoenicurus ochruros*) in Elmshorn. *Corax* **9(1)**: 47-50.
Meyer, O. (1934). Bruten von *Hirundo tahitica frontalis*. *Beitr. Fortpflanzungsbiol. Vögel* **10**: 141-143.
Meyer de Schauensee, R. (1945). Notes on Colombian flycatchers, manakins and cotingas. *Proc. Acad. Nat. Sci. Philadelphia* **97**: 41-57.
Meyer de Schauensee, R. (1948). *The Birds of the Republic of Colombia*. Part 3. Caldasia **5**. 226 pp.
Meyer de Schauensee, R. (1966). *The Species of Birds of South America and their Distribution*. Livingston Publishing Company, Narbeth, Pennsylvania.
Meyer de Schauensee, R. (1982). *A Guide to the Birds of South America*. Livingston Publishing Company for the Academy of Natural Sciences of Philadelphia (reprinted with addenda by ICBP Pan-American Section), Wynnewood, Pennsylvania.
Meyer de Schauensee, R. (1984). *The Birds of China*. Smithsonian Institution Press, Washington D.C.
Meyer de Schauensee, R. & Phelps, W.H. (1978). *A Guide to the Birds of Venezuela*. Princeton University Press, Princeton, New Jersey.
Mezquida, E.T. (2002). Nidificación de ocho especies de tyrannidae en la Reserva de Ñacuñán, Mendoza, Argentina. [Nesting of eight species of tyrannidae in the Reserve of Ñacuñán, Mendoza, Argentina]. *Hornero* **17(1)**: 31-40. In Spanish with English summary.
Mezquida, E.T. (2004). Nest site selection and nesting success of five species of passerines in a South American open *Prosopis* woodland. *J. Orn.* **145(1)**: 16-22.
Mezquida, E.T. & Marone, L. (2000). Breeding biology of Gray-crowned Tyrannulet in the Monte Desert, Argentina. *Condor* **102(1)**: 205-210.
Mezquida, E.T. & Marone, L. (2002). Microhabitat structure and avian nest predation risk in an open Argentinean woodland: an experimental study. *Acta Oecol.* **23(5)**: 313-320.
Michael, E.D. (1970). Frequency of feeding nestling Purple Martins. *Amer. Midl. Nat.* **84**: 284-286.
Michael, J.H. (1992). Intertidal nest of Northern Rough-winged Swallow. *Wash. Birds* **2**: 23-24.
Michaud, T. & Leonard, M. (2000). The role of development, parental behavior, and nestmate competition in fledging of nestling Tree Swallows. *Auk* **117(4)**: 996-1002.
Michelat, D. (1998). Hivernage de l'Alouette haussecol *Eremophila alpestris* en France continentale. [Wintering of Shore Lark in inland France]. *Ornithos* **5(2)**: 88-89.
Michelsen, S. (1982). *Rock Wrens, Mount Cook National Park: Habitat Requirements and Feeding Behaviour*. BSc thesis, Otago University, Dunedin, New Zealand.
Michelsen-Heath, S. (1989). *The Breeding Biology of the Rock Wren,* Xenicus gilviventris, *in the Murchison Mountains, Fiordland National Park, South Island, New Zealand*. MSc thesis, Otago University, Dunedin, New Zealand.
Michie, R.H. (1959a). Welcome Swallows nesting in Northland - a new bird in New Zealand. *Notornis* **8(3)**: 61-62.
Michie, R.H. (1959b). Further notes on Welcome Swallows in Northland. *Notornis* **8(6)**: 157-158.
Mickleburgh, S. & Fisher, M. (2003). Vital decision for two of Brazil's most threatened birds. *Oryx* **37(4)**: 339.
Mihaly, E. (1980). Die Eiermasse der ungarischen Kurzzehenlerche (*Calandrella brachydactyla hungarica* Horvath). *Aquila* **86**: 91-92.
Mild, K. (1990). *Bird Songs of Israel and the Middle East* (two cassettes and booklet). Privately published, Stockholm.
Miles, M.L. (1967). An addition to the avifauna of the United States: *Myiarchus stolidus sagrae*. *Auk* **84**: 279.
Millener, P.R. (1988). Contributions to New Zealand's late Quaternary avifauna. Part 1. *Pachyplichas*, a new genus of wren (Aves: Acanthisittidae), with two new species. *J. Roy. Soc. New Zealand* **18**: 383-406.
Millener, P.R. (1989). The only flightless passerine; the Stephens Island Wren (*Traversia lyalli*: Acanthisittidae). *Notornis* **36(4)**: 280-284.
Millener, P.R. & Worthy, T.H. (1991). Contributions to New Zealand's late Quaternary avifauna. Part 2. *Dendroscansor decurvirostris*, a new genus and species of wren (Aves: Acanthisittidae). *J. Roy. Soc. New Zealand* **21(2)**: 179-200.
Miller, A.H. (1947). The tropical avifauna of the upper Magdalena valley, Colombia. *Auk* **64(3)**: 351-381.
Miller, A.H. (1955a). Breeding cycles in a constant equatorial environment in Colombia, South America. Pp. 495-503 in: Thomson, (1955).
Miller, A.H. (1955b). The avifauna of the Sierra del Carmen of Coahuila, Mexico. *Condor* **57(3)**: 154–178.
Miller, A.H. (1963). Seasonal activity and ecology of the avifauna of an American equatorial cloud forest. *Univ. Calif. Publ. Zool.* **66(1)**: 1-78.
Miller, A.H., Friedmann, H., Griscom, L. & Moore, R.T. (1957). *Distributional Checklist of the Birds of Mexico*. Part 2. Pacific Coast Avifauna **33**. Cooper Ornithological Society, Berkeley, California.
Miller, C.M. (1995). *100 Birds of Belize*. American Bird Conservancy, Gallon Jug, Belize.
Miller, J.H. & Green, M.T. (1987). Distribution, status, and origin of Water Pipits breeding in California. *Condor* **89(4)**: 788-797.
Miller, M. (1991). Notes on the display and vocalisation of an immature Superb Lyrebird. *Austr. Bird Watcher* **14(2)**: 68.
Miller, W.D. (1908). A review of the manakins of the genus *Chiroxiphia*. *Bull. Amer. Mus. Nat. Hist.* **24**: 331-343.
Mills, D.G.H. & Preston, N.A. (1982). Identification of Blyth's Pipit. *British Birds* **75(8)**: 381.
Mills, M. & Cohen, C. (2004). Birding Cameroon, part 2. Southern Cameroon: forests, low to lofty. *Bull. African Bird Club* **11(1)**: 51-58.
Milon, P., Petter, J.J. & Randrianasolo, G. (1973). *Faune de Madagascar*. Vol. XXXV. Oiseaux. ORSTOM & CNRS, Tananarive & Paris.
Milsom, T.P., Langton, S.D., Parkin, W.K., Allen, D.S., Bishop, J.D. & Hart, J.D. (2001). Coastal grazing marshes as a breeding habitat for Skylarks *Alauda arvensis*. Pp. 41-51 in: Donald & Vickery (2001).
Milstein, P. le S. (1966). Short-tailed Pipit. *Witwatersrand Bird Club News* **56**: 6.
Milstein, P. le S. (2000). Comparison of Bushveld Pipit and Short-tailed Pipit. *BirdLife South Afr. Newsl.* **2(1)**: 29.
Milton, S.J. & Dean, W.R.J. (1999). The selective use of green aromatic plants in Karoo bird nests. *Ostrich* **70(3/4)**: 243-245.
Milwright, R.D.P. (1990). Sex differences in breeding colony fidelity of House Martins *Delichon urbica*. *Ringing & Migration* **11**: 101-103.
Miserendino, R.S. (1998). Las aves del Izozog y zonas aledañas, Prov. Cordillera, Dpto. Santa Cruz. Pp. 73-82 in: Sagot & Guerrero (1998).
Mishra, C. (2000). Aseasonal flocking in the Horned Lark *Eremophila alpestris* in India. *Forktail* **16**: 171-172.
Miskell, J.E. & Ash, J.S. (1985). Gillett's Lark *Mirafra gilletti* new to Kenya. *Scopus* **9(1-2)**: 53-54.
Mitchell, J.S. & Robertson, R.J. (1993). Tree Swallows cannot be classified as determinate or indeterminate layers. *Condor* **95(3)**: 546-553.
Mitchell, J.S. & Robertson, R.J. (1996). Extra nest site occupancy by Tree Swallows: do floaters avoid nest sites near settled pairs? *Wilson Bull.* **108**: 797-802.
Mitchell, M.H. (1957). *Observations on Birds of Southeastern Brazil*. University of Toronto Press, Toronto.
Mitra, A. (1980). Birds getting scarce. *Newsl. Birdwatchers* **20(3)**: 10-11.
Mlingwa, C.O.F. (1991). Further records of the Sokoke Pipit *Anthus sokokensis* from Tanzania. *Scopus* **15**: 57-58.
Mlingwa, C.O.F. (1993). Vikindu Forest Reserve, Tanzania: a first ornithological survey including a record of the Sokoke Pipit *Anthus sokokensis*. *Scopus* **17**: 8-13.
Mlingwa, C.O.F. (1996). A note on the rediscovery of the Sokoke Pipit *Anthus sokokensis* in the Pugu Hills, Tanzania. *Bird Conserv. Int.* **6**: 293-294.
Mlingwa, C.O.F., Huxham, M.R. & Burgess, N.D. (1993). The avifauna of Kazimzumbe Forest Reserve, Tanzania: initial findings. *Scopus* **16**: 81-88.
Mlodinow, S.G. & O'Brien, M. (1996). *America's 100 Most Wanted Birds*. Falcon, Helena, Montana.
Mobley, J.A. (2002). *Molecular Phylogenetics and the Evolution of Nest Building in Kingbirds and their Allies (Aves: Tyrannidae)*. PhD dissertation, University of California, Berkeley, California.
Mobley, J.A. & Prum, R.O. (1995). Phylogenetic relationships of the Cinnamon Tyrant, *Neopipo cinnamomea*, to the tyrant flycatchers (Tyrannidae). *Condor* **97(3)**: 650-662.
Módena, E.S., Lino, C.M. & Marques, E.J. (2000). Utilização de caixas de madeira como locais para nidificação de aves em áreas urbanas. Pp. 256-257 in: Straube *et al.* (2000). (Abstract).
Moeed, A. (1975). Food of skylarks and pipits, finches, and feral pigeons near Christchurch. *Notornis* **22(2)**: 135-142.
Moeed, A. & Fitzgerald, B.M. (1982). Foods of insectivorous birds in forests of the Orongorongo Valley, Wellington, New Zealand. *New Zealand J. Zool.* **9(3)**: 391-402.
Moermond, T.C. (1985). Neotropical avian frugivores: patterns of behavior, morphology, and nutrition, with consequences for fruit selection. Pp. 865-897 in: Buckley *et al.* (1985).
Moermond, T.C. & Denslow, J.S. (1985). Neotropical avian frugivores: patterns of behavior, morphology, and nutrition, with consequences for fruit selection. Pp. 865-897 in: Buckley *et al.* (1985).
Mohamued, A., Hundessa, T. & Hillman, J.C. (1992). Bird conservation in Ethiopia. Pp. 435-441 in: Bennun (1992).
Mohan, D. (1997). Birds of New Forest, Dehra Dun, India. *Forktail* **12**: 19-30.
Mohapatra, K.K. & Prakash, R. (1990). Occurrence of Long-clawed Skylark *Alauda gulgula dharmakumarsinhji* in central India. *J. Bombay Nat. Hist. Soc.* **87(1)**: 146.
Mohr, L.V., Efe, M.A., Bugoni, L., Scherer, A. & Scherer, S.B. (2000). Novos registros de aves para o Rio Grande do Sul, em parques urbanos de Porto Alegre e Viamão. Pp. 323-324 in: Straube *et al.* (2000). (Abstract).
Moiseev, A.P. (1980). [About nesting biology of Black Lark in central and northern Kazakhstan]. Pp. 120-126 in: Kovshar, A.F. (1980). ed. *Biologiya ptits Naurzumskogo Gosudarstvennogo Zapovednika*. Forest Ministry of the Kazakh SSR, Alma-Ata, Kazakhstan. In Russian.
Moksnes, A. & Roskaft, E. (1989). Adaptations of Meadow Pipits to parasitism by the Common Cuckoo. *Behav. Ecol. Sociobiol.* **24(1)**: 25-30.
Møller, A.P. (1978). Population size and changes of Crested Larks *Galerida cristata* in north Jutland, with remarks on population regulation. *Dan. Orn. Foren. Tidssk.* **72(4)**: 189-196.
Møller, A.P. (1985). [Annual cycle and breeding biology of the Crested Lark (*Galerida cristata*) in Aalborg]. *Flora og Fauna* **91(2)**: 11-15.
Møller, A.P. (1986). Mating systems among European passerines: a review. *Ibis* **128(2)**: 234-250.
Møller, A.P. (1994a). *Sexual Selection and the Barn Swallow*. Oxford University Press, Oxford.
Møller, A.P. (1994b). Parasite infestation and parental care in the Barn Swallow *Hirundo rustica*: a test of the resource-provisioning model of parasite-mediated sexual selection. *Ethology* **97**: 215-225.
Møller, A.P. (1994c). Sexual selection in the Barn Swallow (*Hirundo rustica*). IV. Patterns of fluctuating asymmetry and selection against asymmetry. *Evolution* **48**: 658-670.
Møller, A.P. (1994d). Symmetrical male sexual ornaments, paternal care, and offspring quality. *Behav. Ecol.* **5**: 188-194.
Møller, A.P. (1994e). Repeatability of female choice in a monogamous swallow. *Anim. Behav.* **47**: 643-648.
Møller, A.P. (1994f). Phenotype-dependent arrival time and its consequences in a migratory bird. *Behav. Ecol. Sociobiol.* **35**: 115-122.
Møller, A.P. (1994g). Male ornament size as a reliable cue to enhanced offspring viability in the Barn Swallow. *Proc. Natl. Acad. Sci. USA* **91**: 6929-6932.
Møller, A.P. (1995). Sexual selection in the Barn Swallow (*Hirundo rustica*). V. Geographic variation in ornament size. *J. Evol. Biol.* **8**: 3-19.
Møller, A.P. (1996a). Development of fluctuating asymmetry in tail feathers of the Barn Swallow *Hirundo rustica*. *J. Evol. Biol.* **9**: 677-694.
Møller, A.P. (1996b). The cost of secondary sexual characters and the evolution of cost-reducing traits. *Ibis* **138(1)**: 112-119.
Møller, A.P. (2001a). The effect of dairy farming on Barn Swallows *Hirundo rustica* abundance, distribution and reproduction. *J. Appl. Ecol.* **38**: 378-389.
Møller, A.P. (2001b). Heritability of arrival date in a migratory bird. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **268**: 203-206.
Møller, A.P. & Barbosa, A. (2001). Flight, fitness and sexual selection. *Behav. Ecol.* **12**: 511-512.
Møller, A.P. & de Lope, F. (1994). Differential costs of a secondary sexual character: an experimental test of the handicap principle. *Evolution* **48**: 1676-1683.
Møller, A.P. & de Lope, F. (1999). Senescence in a short-lived migratory bird: age-dependent morphology, migration, reproduction and parasitism. *J. Anim. Ecol.* **68**: 163-171.
Møller, A.P. & Tegelström, H. (1997). Extra-pair paternity and tail ornamentation in the Barn Swallow *Hirundo rustica*. *Behav. Ecol. Sociobiol.* **41**: 353-360.
Møller, A.P., Barbosa, A., Cuervo, J.J., de Lope, F., Merino, S. & Saino, N. (1998). Sexual selection and tail streamers in the Barn Swallow. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **265**: 409-414.
Møller, A.P., de Lope, F. & Caballero, J.M.L. (1995). Foraging costs of a tail ornament: experimental evidence from two populations of Barn Swallows *Hirundo rustica* with different degrees of sexual size dimorphism. *Behav. Ecol. Sociobiol.* **37**: 289-295.
Møller, A.P., de Lope, F., Moreno, J., González, G. & Pérez, J.J. (1994). Ectoparasites and host energetics: House Martin bugs and House Martin nestlings. *Oecologia* **98**: 263-268.
Møller, A.P., de Lope, F. & Saino, N. (1995). Sexual selection in the Barn Swallow *Hirundo rustica*. VI. Aerodynamic adaptations. *J. Evol. Biol.* **8**: 671-687.
Møller, A.P., Magnhagen, C., Ulfstrand, A. & Ulfstrand, S. (1995). Phenotypic quality and molt in the Barn Swallow, *Hirundo rustica*. *Behav. Ecol.* **6**: 242-249.
Møller, A.P., Merino, S., Brown, C.R. & Robertson, R.J. (2001). Immune defense and host sociality: a comparative study of swallows and martins. *Amer. Naturalist* **158(2)**: 136-145.
Møller, A.P., Saino, N., Taramino, G., Galeotti, P. & Ferrario, S. (1998). Paternity and multiple signaling: effects of a secondary sexual character and song on paternity in the Barn Swallow. *Amer. Naturalist* **151**: 236-242.
Molli, A.F. (1985). Nido de Doradito Tucumano. *Nuestras Aves* **8**: 12.
Mollison, B.C. & Green, R.H. (1962). Mist-netting Tree Martins on charcoal patches. *Emu* **61**: 277-280.
Monk, J.F. ed. (1992). *Avian Systematics and Taxonomy*. Bulletin of the British Ornithologists' Club. Centenary Supplement **112A**.
Monroe, B.L. (1968). *A Distributional Survey of the Birds of Honduras*. Ornithological Monographs **7**. American Ornithologists' Union, Washington, D.C. 458 pp.
Monson, G. & Phillips, A.R. (1981). *Annotated Checklist of the Birds of Arizona*. 2nd edition. University of Arizona Press, Tucson, Arizona.
Moojen, J., de Carvalho, J.C. & de Souza, H. (1941). Observações sobre o conteúdo gastrico das aves brasileiras. *Mem. Inst. Oswaldo Cruz* **36**: 405-444.
Moon, G. (1980). *The Birds Around Us. New Zealand Birds, their Habits and Habitats*. Heinemann, Auckland, New Zealand.
Moon, G. (1992). *The Reed Field Guide to New Zealand Birds*. Reed, Birkenhead.
Moon, G. (1994). *New Zealand Birds*. Reed Books, Auckland, New Zealand.
Moon, G. (2001). *New Zealand. Land of Birds*. New Holland, Auckland.
Moon, G. & Lockley, R. (1982). *New Zealand's Birds*. Heinemann, Auckland, New Zealand.
Moore, C.C. (1989). Lesser Short-toed Lark in Portugal. *Dutch Birding* **11(1)**: 28-29.
Moore, H.J. & Boswell, C. (1956). *Field Observations on the Birds of Iraq*. Part II. Publications of the Iraq Natural History Museum **10**. Bagdad.
Moore, O.R., Stutchbury, B.J.M. & Quinn, J.S. (1999). Extrapair mating system of an asynchronously breeding tropical songbird: the Mangrove Swallow. *Auk* **116(4)**: 1039-1046.
Moore, R.D. (1979). Spike-heeled Lark *Chersomanes albofasciata* at Amboseli: a new bird for Kenya. *Scopus* **3(4)**: 103.
Moore, R.T. (1944). Nesting of the Brown-capped Leptopogon in Mexico. *Condor* **46(1)**: 6-8.
Morcombe, M. (2000). *Field Guide to Australian Birds*. Steve Parish Publishing Ltd, Archerfield, Australia.
Moreau, R.E. (1939a). Parental care by some African swallows and swifts. *Bull. Brit. Orn. Club* **59**: 145-149.
Moreau, R.E. (1939b). Numerical data on African birds' behaviour at the nest. *Hirundo s. smithii* Leach, the Wire-tailed Swallow. *Proc. Zool. Soc. London* **109**: 109-125.
Moreau, R.E. (1940a). Numerical data on African birds' behaviour at the nest. II. *Psalidoprocne holomelaena massaica* Neum., the Rough-wing Bank Martin. *Ibis* **Ser. 14, no. 4**: 234-248.
Moreau, R.E. (1940b). Distributional notes on East African birds. *Ibis* **Ser. 14, no. 4**: 454-463.
Moreau, R.E. (1947). Relations between number in brood, feeding-rates and nestling period in nine species of birds in Tanganyika Territory. *J. Anim. Ecol.* **16**: 205-209.
Moreau, R.E. (1949). The African Mountain Wagtail *Motacilla clara* at the nest. Pp. 183-191 in: Mayr, E. & Schüz, E. eds. (1949). *Ornithologie als Biologische Wissenschaft*. Carl Winter, Heidelberg, Germany.
Moreau, R.E. (1966). *The Bird Faunas of Africa and its Islands*. Academic Press, New York & London.
Moreau, R.E. & Moreau, W.M. (1939). Observations on Sand Martins at the nest. *British Birds* **33**: 95-97.
Moreau, R.E. & Moreau, W.M. (1940). Incubation and fledging periods of African birds. *Auk* **57**: 313-325.
Morel, G.J. (1968). *Contribution à la Synécologie des Oiseaux du Sahel Sénégalais*. Mémoires ORSTOM **29(1)**. Éditions de l'ORSTOM, Paris. 179 pp.
Morel, G.J. (1981). Réponse a la pluie de *Mirafra javanica*. *Malimbus* **3(2)**: 57-58.
Morel, G.J. & Morel, M.Y. (1984). *Eremopterix nigriceps albifrons* et *Eremopterix leucotis melanocephala* (Alaudidés) au Sénégal. Pp. 309-322 in: Ledger (1984).
Morel, G.J. & Morel, M.Y. (1990). *Les Oiseaux de Sénégambie*. Éditions de l'ORSTOM, Paris.
Morel, G.J. & Morel, M.Y. (1992). Habitat use by Palearctic migrant passerine birds in West Africa. *Ibis* **134**(Suppl.): 83-88.
Morel, G.J. & Ndao, B. (1978). Trois nouvelles espèces sahariennes pour le Sénégal. *Oiseau et RFO* **48(3)**: 281-282.
Moreno, E. (1986). Clave osteológica para la identificación de los Passeriformes ibéricos. II. Hirundinidae, Prunellidae, Sittidae, Certhiidae, Troglodytidae, Cinclidae, Laniidae, Oriolidae, Corvidae, Sturnidae, Motacillidae. *Ardeola* **33(1&2)**: 69-129. In Spanish with English summary.

Moreno, E. & Møller, A.P. (1996). Morphological aspects of avian tail movements: a functional approach in hirundines. *Auk* **113(3)**: 647-654.
Morgan, J.G. & Feltner, L.M. (1985). A neotropical bird flies north: the Greenish *Elaenia*. *Amer. Birds* **39**: 242-244.
Morgan, J.H. & Palfery, J. (1986). Some notes on the Black-crowned Finch Lark. *Sandgrouse* **8**: 58-73.
Morgan, R.A. (1979). Sand Martin nest record cards. *Bird Study* **26**: 129-132.
Moritz, D. (1989). Das heutige Vorkommen der Heidelerche *Lullula arborea* auf Helgoland. *Vogelwelt* **110(5)**: 185-193.
Morlan, J. (1981). Status and identification of forms of White Wagtail in western North America. *Cont. Birdl.* **2(2)**: 37-50.
Morlan, J. & Erickson, R.A. (1983). A Eurasian Skylark at Point Reyes, California, with notes on skylark identification and systematics. *Western Birds* **14(3)**: 113-126.
Morlion, M.L. (1980). The wing and tail pterylosis in *Menura superba*. Page 1380 in: Nohring, R. ed. (1980). *Acta XVII Congressus Internationalis Ornithologici, Berlin 1978*. Verlag D.O.G., Berlin. (Abstract).
Morlion, M.L. (1985). Pterylosis of the wing and tail in the Noisy Scrub-bird, *Atrichornis clamosus*, and Superb Lyrebird, *Menura novaehollandiae* (Passeriformes: Atrichornithidae and Menuridae). *Records Austr. Mus.* **37(3-4)**: 143-156.
Moroney, D. (1972). Plumage changes in the Superb Lyrebird. *Emu* **72(1)**: 17-21.
Morrill, S.B. & Robertson, R.J. (1990). High occurrence of extra-pair copulation in the Tree Swallow (*Tachycineta bicolor*). *Behav. Ecol. Sociobiol.* **26**: 291-296.
Morris, P. & Hawkins, A.F.A. (1998). *Birds of Madagascar. A Photographic Guide*. Pica Press, Nr. Robertsbridge, UK.
Morris, R. & Smith, H. (1988). *Wild South. Saving New Zealand's Endangered Birds*. TVNZ & Century Hutchinson, Auckland, New Zealand.
Morris, R.P. (1992). Bar-tailed Desert Larks *Ammomanes cincturus* in the Baynunah area, Abu Dhabi: the first live records for the U.A.E. *Emirates Bird Rep.* **16**: 3-4.
Morrison, A. (1939). The birds of the department of Huancavelica, Peru. *Ibis* **Ser. 14, no. 3**: 453-486.
Morrison, K. (1987). Welcome Swallows breeding near Te Anau. *Notornis* **34(3)**: 192.
Morrison, K. & Morrison, J.V. (1985). Unusual riverbed birds in the Eglinton Valley, Fiordland. *Notornis* **32(3)**: 244.
Morton, E.S. (1977). Intratropical migration in the Yellow-green Vireo and Piratic Flycatcher. *Auk* **94**: 97-106.
Morton, E.S. (1987). Variation in mate guarding intensity by male Purple Martins. *Behaviour* **101(1-3)**: 211-224.
Morton, E.S. (1988). Dawnsong of the Purple Martin. *Atlantic Naturalist* **38**: 38-48.
Morton, E.S. & Derrickson, K.C. (1990). The biological significance of age-specific return schedules in breeding Purple Martins. *Condor* **92(4)**: 1040-1050.
Morton, E.S. & Patterson, R.M. (1983). Kin association, spacing, and composition of a post-breeding roost of Purple Martins. *J. Field Orn.* **54(1)**: 36-41.
Morton, E.S., Forman, L. & Braun, M. (1990). Extrapair fertilizations and the evolution of colonial breeding in Purple Martins. *Auk* **107(2)**: 275-283.
Morton, R. (1995). Sex, lies and DNA: DNA fingerprinting techniques unravel the truth about Purple Martin sexual behavior. *Birder's World* **9(5)**: 28-31.
Mosimann-Kampe, P. (2000). Erstnachweis des Waldpiepers *Anthus hodgsoni* in der Schweiz. *Orn. Beob.* **97(3)**: 252-254.
Moss, W.W. (1972). Some ecological relationships of Purple Martins and their acarine ectoparasites. *J. Med. Entomol.* **9**: 599.
Moss, W.W. & Camin, J.H. (1970). Nest parasitism, productivity, and clutch size in Purple Martins. *Science* **168**: 1000-1003.
Mouchard, A. (1998). Historia natural de una cachirla. *Nuestras Aves* **15(38)**: 3.
Mountfort, G. (1954). The larks of Andalucía. *Ibis* **96**: 111-115.
Mousley, H. (1916). The breeding of the Prairie Horned Lark at Hatley, Stanstead Co., Quebec. *Auk* **33**: 261-286.
Mousley, H. (1931). A study of the home life of the Alder Flycatcher (*Empidonax traillii traillii*). *Auk* **48**: 547-552.
Moyer, D.C. (1983). A record of the Pearl-breasted Swallow *Hirundo dimidiata* from Lake Sundu in southwestern Tanzania. *Scopus* **7(2)**: 51-52.
Moyer, D.C. & Sikombe, S.W. (1992). Notes on birds from southwest Tanzania including an addition to the East African avifauna. *Scopus* **16**: 55-56.
Moyer, D.C. & Stjernstedt, R. (1986). A new bird for East Africa and extensions of range of some species for southwest Tanzania. *Scopus* **10**: 99-102.
Moynihan, M. (1960). Some adaptations which help to promote gregariousness. Pp. 523-541 in: Bergman *et al.* (1960).
Moynihan, M. (1979). *Geographic Variation in Social Behavior and in Adaptations to Competition among Andean Birds*. Publications of the Nuttall Ornithological Club **18**. Cambridge, Massachusetts.
Mrlíkova, Z. & Mrlík, V. (1992). Agonistic behaviour of Bank Swallows, *Riparia riparia*, during breeding season. *Folia Zoologica* **41**: 311-321.
Muchai, M. (1998). *Some Aspects of the Conservation Biology of Sharpe's Longclaw* (Macronyx sharpei, *Jackson 1904*) *- a Kenyan Grassland Endemic Bird*. MSc thesis, Moi University, Eldoret, Kenya.
Muchai, M. (2001). Effects of grassland management practices on the reproductive success of South African high-altitude grassland species. Proceedings of the 10th Pan-African Ornithological Congress, Kampala, Uganda, 3-8 September 2000. *Ostrich* **15**(Suppl.): 31.
Muchai, M., Bennun, L. & Lens, L. (1998). The ecology of Sharpe's Longclaw *Macronyx sharpei* - a Kenyan grassland endemic bird. Proceedings of the XXII International Ornithological Congress, Durban. *Ostrich* **69(3&4)**: 299.
Muchai, M., Bennun, L. & Lens, L. (2001). Notes on the behaviour and ecology of Sharpe's Longclaw *Macronyx sharpei*, a threatened Kenyan grassland endemic. *Scopus* **22**: 23-28.
Muchai, M., Bennun, L., Lens, L., Rayment, M. & Pisano, G. (2002). Land-use and the conservation of Sharpe's Longclaw *Macronyx sharpei* in central Kenya. *Bird Conserv. Int.* **12(2)**: 107-121.
Muchai, M., Lens, L. & Bennun, L. (2002). Habitat selection by Sharpe's Longclaw *Macronyx sharpei*, a near-threatened Kenyan grassland endemic. *Biol. Conserv.* **105(3)**: 271-277.
Muchai, S.M. (2002). *Going through the Motions: the Impacts of Frequent Fires and Grazing Pressure on Reproduction by Montane Grassland Birds*. PhD thesis, University of Cape Town, Cape Town.
Muchane, M., Lens, L. & Bennun, L. (1996). Some aspects of conservation biology of Sharpe's Longclaw *Macronyx sharpei*. Page 74 in: Ntiamoa-Baidu, Y. ed. (1996). *Ninth Pan-African Ornithological Congress, Accra, Ghana 1-8 December 1996*. (Abstract).
Mukherjee, A.K. (1995). *Birds of Arid and Semi-arid Tracts*. Zoological Survey of India Occasional Paper **142**. Calcutta. 318 pp.
Mulai, V.K. (1999). Nesting Ethiopian Swallows at Lewa Downs. *Kenya Birds* **7**: 56.
Muldal, A., Gibbs, H.L. & Robertson, R.J. (1985). Preferred nest spacing of an obligate cavity-nesting bird, the Tree Swallow. *Condor* **87(3)**: 356-363.
Muller, H.E.J. (1989). Schnelle Legefolge bei der Haubenlerche (*Galerida cristata*)? Oder: wie oft legen Haubenlerchen in fremde Nester? (Aves, Passeriformes: Alaudidae). [A rapid laying sequence in the Crested Lark (*Galerida cristata*)? Or: how often do Crested Larks lay in nests other than their own? (Aves, Passeriformes: Alaudidae)]. *Zool. Abh. Staatl. Mus. Tierk. Dresden* **44(2)**: 133-136. In German with English summary.
Müller, H.E.J. (1983). Nestbau des Brachpiepers (*Anthus campestris*) unter Beteiligung des Männchens. *Beitr. Vogelkd.* **29(4)**: 245-246.
Mullié, W.C. & Keith, J.O. (1991). Notes on the breeding biology, food and weight of the Singing Bush-lark *Mirafra javanica* in northern Senegal. *Malimbus* **13(1)**: 24-39.
Mullié, W.C. & Keith, J.O. (1993). Locusticide impact on birds in northern Senegal. *K. Mus. Midden-Afr. Tervuren Belg. Ann. Zool. Wet.* **268**: 617-620.
Mumford, R.E. (1964). *The Breeding Biology of the Acadian Flycatcher*. Miscellaneous Publications of the Museum of Zoology of the University of Michigan **125**. 50 pp.
Mumford, R.E. & Keller, C.E. (1984). *The Birds of Indiana*. Indiana University Press, Bloomington, Indiana.
Munn, C.A. (1985). Permanent canopy and understory flocks in Amazonia: species composition and population density. Pp. 683-712 in: Buckley *et al.* (1985).
Munro, M. (1969). Welcome Swallows in Whangarei Country, 1962/68. *Notornis* **16(3)**: 198-201.
Munro, M. (1973). Increase in Welcome Swallows near Whangarei, 1968-71. *Notornis* **20(1)**: 74-76.
Munteanu, D. & Szabó, L. (2001). Breeding by Horned Larks in southern Carpathians, Romania. *British Birds* **94(1)**: 42-43.
Muriuki, J.N., De Klerk, H.M., Williams, P.H., Bennun, L.A., Crowe, T.M., van den Berge, E. (1997). Using patterns of distribution and diversity of Kenyan birds to select and prioritize areas for conservation. *Biodiversity and Conservation* **6(2)**: 191-210.
Murphy, M.T. (1983a). Clutch size in the Eastern Kingbird: factors affecting nestling survival. *Auk* **100(2)**: 326-334.
Murphy, M.T. (1983b). Ecological aspects of the reproductive biology of Eastern Kingbirds: geographic comparisons. *Ecology* **64**: 914-928.
Murphy, M.T. (1983c). Nest success and nesting habits of Eastern Kingbirds and other flycatchers. *Condor* **85(2)**: 208-219.
Murphy, M.T. (1986a). Temporal components of reproductive variability in Eastern Kingbirds (*Tyrannus tyrannus*). *Ecology* **67**: 1483-1492.
Murphy, M.T. (1986b). Body size and condition, timing of breeding, and aspects of egg production in Eastern Kingbirds. *Auk* **103(3)**: 465-476.
Murphy, M.T. (1986c). Brood parasitism of Eastern Kingbirds by Brown-headed Cowbirds. *Auk* **103(3)**: 626-628.
Murphy, M.T. (1989). Life history variability in North American breeding tyrant flycatchers: phylogeny, size or ecology? *Oikos* **55**: 3–14.
Murphy, M.T. (1994). Breeding patterns of Eastern Phoebes in Kansas: adaptive strategies or physiological constraint? *Auk* **111(3)**: 617-633.
Murphy, M.T. (1996). Eastern Kingbird (*Tyrannus tyrannus*). No. **253** in: Poole, A.F. & Gill, F.B. eds. (1996). *The Birds of North America*. Vol. 7. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Murphy, M.T. (2000a). Is reproduction by Tree Swallows cost free? *Auk* **117(4)**: 902-912.
Murphy, M.T. (2000b). Source-sink dynamics of a declining Eastern Kingbird population and the value of sink habitats. *Conserv. Biol.* **15(3)**: 737-748. In English with Spanish summary.
Murphy, M.T., Cummings, C.L. & Palmer, M.S. (1997). Comparative analysis of habitat selection, nest site and nest success by Cedar Waxwings (*Bombycilla cedrorum*) and Eastern Kingbirds (*Tyrannus tyrannus*). *Amer. Midl. Nat.* **138**: 344-356.
Murphy, W.L. (1995). *A Birder's Guide to Trinidad and Tobago*. Peregrine Enterprises, Parkersburg, West Virginia.
Murphy, W.L. & Hayes, F.E. (2001). First records of Caribbean Martin (*Progne dominicensis*) for Trinidad, with comments on its supposed migration to South America. *Pitirre* **14(2)**: 61-62.
Murr, F. (1923). Die Felsenschwalbe in den Berchtesgadener Alpen. *Verh. Orn. Ges. Bayern* **15**: 331-346.
Murray, A., Murray, L.M. & Hicks, R.K. (1987). The Fairy Martin *Hirundo ariel* in Papua New Guinea: three new sight records and a brief review. *Muruk* **2(2)**: 64-65.
Murray, L.D., Best, L.B., Jacobsen, T.J. & Braster, M.L. (2003). Potential effects on grassland birds of converting marginal cropland to switchgrass biomass production. *Biomass & Bioenergy* **25**: 167-175.
Muselet, D. (1979). Observation de l'Alouette calandrelle (*Calandrella brachydactyla*). *Nat. Orleanais* **28**: 41-43.
Muselet, D. (1981). Nidification de l'Alouette calandrelle (*Calandrella brachydactyla*) dans le Loiret. *Oiseau et RFO* **51(1)**: 63.
Muselet, D. (1983). L'Alouette calandrelle (*Calandrella brachydactyla*) dans le Loiret. *Oiseau et RFO* **53(2)**: 182.
Musila, F., Bennun, L.A. & Karanja, W. (2001). The Sokoke Pipit *Anthus sokokensis* in Arabuko-Sokoke Forest, Kenya: population estimates and response to habitat disturbances. Proceedings of the Tenth Pan-African Ornithological Congress, Kampala, Uganda, 3-8 September 2000. *Ostrich* **15**(Suppl.): 198. (Abstract).
Mussa, J. & Tala, C. (1996). Observación de Golondrina Negra (*Progne modesta*) en la provincia de Antofagasta. *Bol. Chileno Orn.* **3**: 39-40.
Myburgh, N. & Steyn, P. (1989). Notes on a Red Lark's nest. *Birding in SA* **41(4)**: 114-115.
Myklebust, M. (2000). [The Woodlark in Telemark]. *Vår Fuglefauna* **23(4)**: 162.
Myres, M.T. (1957). Clutch size and laying dates in Cliff Swallow colonies. *Condor* **59(5)**: 311-316.
Nadler, T. (1974). Die Kurzzehenlerche - ein Brutvogel Ungarns. *Falke* **21**: 12-17.
Nadler, T. (1991). Der Goliath der Lerchen. Riesensumpflerche - ein Brutvogel Tibets. *Falke* **38**: 106-111.
Naka, L.N. (2004). Structure and organization of canopy bird assemblages in central Amazonia. *Auk* **121(1)**: 88-102.
Naka, L.N., Mazar Barnett, J., Kirwan, G.M., Tobias, J.A. & de Azevedo, M.A.G. (2000). New and noteworthy bird records from Santa Catarina State, Brazil. *Bull. Brit. Orn. Club* **120(4)**: 237-250.
Naka, L.N., Mazar Barnett, J., Kirwan, G.M., Tobias, J.A. & Buzzetti, D. (2001). Records of bird species previously considered uncommon in Santa Catarina State, Brazil. *Cotinga* **16**: 68-70.
Nakama, A. (1984). Breeding distribution and nest sites of the Red-rumped Swallow, *Hirundo daurica*, in the Kanto District and adjacent prefectures. *Strix* **3**: 55-65.
Nakamura, S. (1982). Social structure of the Japanese Wagtail *Motacilla grandis* 1. Social behaviour and spatial structure. *J. Yamashina Inst. Orn.* **14**: 325-343.
Nakamura, S. (1985). Clutch size and breeding success of the Japanese Wagtail *Motacilla grandis*, with a special reference to its habitat and mating system. *J. Yamashina Inst. Orn.* **17**: 84-104.
Nakamura, S., Hashimoto, H. & Sootome, O. (1984). Breeding ecology of *Motacilla alba* and *M. grandis* and their interspecific relationship. *J. Yamashina Inst. Orn.* **16**: 114-135.
Nankinov, D. (2001). [The habitat of the Lesser Short-toed Lark *Calandrella rufescens* of the Balkan Peninsula]. *Orn. Mitt.* **53(8)**: 260-263.
Narosky, S. & Di Giacomo, A.G. (1993). *Las Aves de la Provincia de Buenos Aires: Distribución y Estatus*. Asociación Ornitológica del Plata, Vázquez Mazzini Editores & Literature of Latin America, Buenos Aires.
Narosky, S. & Salvador, S.A. (1998). *Nidificación de las Aves Argentinas: Tyrannidae*. Asociación Ornitológica del Plata, Buenos Aires.
Narosky, T. & Yzurieta, D. (1987). *Guía para la Identificación de las Aves de Argentina y Uruguay*. Vásquez Editores, Buenos Aires.
Narosky, S. & Yzurieta, D. (1993). *Birds of Argentina and Uruguay - A Field Guide*. Vázquez Mazzini Editores, Buenos Aires.
Narosky, S., Di Giacomo, A.G. & López, B. (1990). Notas sobre aves del sur de Buenos Aires. *Hornero* **13(2)**: 173-178.
do Nascimento, J.L.X., do Nascimento, I.L.S. & de Azevedo, S.M. (2000). Aves da Chapada do Araripe (Brasil): biologia e conservação. *Ararajuba* **8(2)**: 115-125.
Nasirwa, O. & Njoroge, P. (1997a). *Papyrus-endemic Birds in the Fringing Swamps of Lake Victoria, Western Kenya*. Research Report **28**. Centre of Biodiversity, National Museums of Kenya, Ornithology, Nairobi.
Nasirwa, O. & Njoroge, P. (1997b). What's happening to the Blue Swallow *Hirundo atrocaerulea* sites in Busia and Suba districts, Kenya? *Bull. East Afr. Nat. Hist. Soc.* **27(1)**: 4-6.
Nation, B., Nation, H. & Hooper, A. (1997). Birds new to Qatar. *Sandgrouse* **19(1)**: 56-62.
Natorp, O. (1925). Starker Durchzug von *Anthus cervinus* (Pall.) bei Myslowitz, Ost-Oberschlesien. [Migration of *Anthus cervinus* (Pall.) through Poland]. *Orn. Monatsber.* **33(3)**: 65-68.
Naumann, J.P. (1905). *Naturgeschichte der Vögel Mitteleuropas*. Vol. 3. Gera-Untermhaus.
Naumburg, E.M.B. (1930). *The Birds of Matto Grosso, Brazil*. American Museum of Natural History, New York.
Naumburg, E.M.B. (1939). Studies of birds from eastern Brazil and Paraguay, based on a collection made by Emil Kaempfer. *Bull. Amer. Mus. Nat. Hist.* **76**: 231-276.
de Naurois, R. (1974). Découverte de la reproduction d'*Eremalauda dunni* dans le Zemmour (Mauritanie septentrionale). *Alauda* **42**: 111-116.
de Naurois, R. (1987). Contribution a l'écologie de trois Alaudidae de l'Archipel du Cap Vert: *Ammomanes cinctura*, *Eremopterix nigriceps* et *Spizocorys rasae* [*razae*]. *Bol. Mus. Municipal Funchal* **39**: 122-140.
de Naurois, R. (1989). Le Sirli de l'archipel du Cap Vert, *Alaemon alaudipes boavistae* Hartert 1917. *Bol. Mus. Municipal Funchal* **41**: 41-53.
Navas, J.R. (1965). El área geográfica de *Phytotoma rara* (Aves, Phytotomidae). *Neotrópica* **11(34)**: 38-40.
Navas, J.R. (1994). Aves nuevas o poco comunes de la Patagonia. *Neotrópica* **40(103-104)**: 93-94.
Navas, J.R. (2002). La distribución geográfica de *Pseudocolopteryx acutipennis* (Tyrannidae) en la Argentina. *Hornero* **17(1)**: 45-48.
Navas, J.R. & Bó, N.A. (1988). Aves nuevas o poco conocidas de Misiones, Argentina. III. *Rev. Mus. Arg. Cienc. Nat. Bernardino Rivadavia* **15(2)**: 11-37.
Navas, J.R. & Bó, N.A. (1991). The geographical distribution of the southern subspecies of the Tufted Tit-Tyrant *Anairetes parulus* in Argentina. *Neotrópica (La Plata)* **37**: 145-149.
Navas, J.R. & Bó, N.A. (1993a). Aves nuevas o poco conocidas de Misiones, Argentina. V (addenda). *Rev. Mus. Arg. Cienc. Nat. Bernardino Rivadavia* **16(4)**: 37-50.
Navas, J.R. & Bó, N.A. (1993b). Distribución de *Phytotoma rutila* en el noroeste argentino (Aves, Phytotomidae). *Neotrópica* **39(101-102)**: 76.
Navas, J.R. & Bó, N.A. (2000). Aportes al conocimiento de la distribución de la cría y el peso de aves de la provincias de Mendoza y San Juan, República Argentina. Primera parte. (Aves: Phytotomidae, Mimidae, Troglodytidae, Motacillidae, Emberizidae, y Fringillidae). *Hornero* **15(2)**: 123-127.
Navas, J.R. & Bó, N.A. (2001). Aportes al conocimiento de la distribución, la cría y el peso de aves de las provincias de Mendoza Y San Juan, República Argentina. Segunda Parte. (Aves: Falconidae, Scolopacidae, Thinocoridae, Columbidae, Psittacidae, Strigidae, Caprimulgidae, Apodidae, Furnariidae, Rhinocryptidae y Tyrannidae). *Hornero* **16**: 31-37.
Nazarenko, A.A. (1978). [On species validity of *Anthus rubescens* Tunstall (Aves, Motacillidae)]. *Zoologischeskii Zhurnal* **57**: 1743-1745. In Russian.

Nazarov, Y.N. (1981). [Biology of Pechora Pipit *Anthus gustavi menzbieri* Shulpin in Primorye]. Pp. 67-73 in: Litvinenko, N.M. ed. (1981). *Redkie Ptitsy Dal'nego Vostoka. [Rare Birds of the Far East]*. Vladivostok. In Russian with English summary.

Ndagn'ang'a, P.K., Mulwa, R. & Gichuki, P. (2003). A survey of the highland grassland endemics in Mau Narok/ Molo Important Bird Area, Kenya. *Bull. African Bird Club* **10(1)**: 64-67. In English with French summary.

Ndagn'ang'a, P.K., du Plessis, M.A., Ryan, P.G. & Bennun, L.A. (2002). Grassland decline in Kinangop Plateau, Kenya: implications for conservation of Sharpe's Longclaw (*Macronyx sharpei*). *Biol. Conserv.* **107**: 341-350.

Nechaev, V.A. & Kurenkov, V.D. (1983). [The Green-headed Wagtail in Sakhalin Island]. *Ornitologiya* **18**: 173-176. In Russian.

Negret, A.J. (2001). *Aves en Colombia Amenazadas de Extinción*. Editorial Universidad del Cauca, Popayán, Colombia.

Nellar, M.M. (1993). *Aves de la Provincia de San Luis. Lista y Distribución*. Museo Privado de Ciencias Naturales e Investigaciones Ornitológicas "Guillermo E. Hudson", San Luis, Argentina.

Nelson, B. (1973). *Azraq: Desert Oasis*. Allen Lane, London.

Nelson, D. (1995). Pacific-slope Flycatcher *Empidonax difficilis*. Page 101 in: Burridge, B. ed. (1995). *Sonoma County Breeding Bird Atlas. Detailed Maps and Accounts for our Local Nesting Birds*. Madrone Audubon Society, Santa Rosa, California.

Nelson, E.W. (1904). A revision of the North American mainland species of *Myiarchus*. *Proc. Biol. Soc. Washington* **17**: 21-50.

Nelson, J.B. (1968). *Galapagos. Islands of Birds*. Longmans, Green & Co., London.

Nelson, K.J. & Martin, K. (1999). Thermal aspects of nest-site location for Vesper Sparrows and Horned Larks in British Columbia. *Stud. Avian Biol.* **19**: 137-143.

Neto, S.D. & Ramos, S. (2001). Ocorrência da Maria-corruíra (*Euscarthmus rufomarginatus*) no Norte de Minas Gerais, Brasil. [Occurrence of the Rufous-sided Pygmy-tyrant (*Euscarthmus rufomarginatus*) in northern Minas Gerais State, Brazil]. *Tangara* **1(2)**: 90-94. In Portuguese with English summary.

Neufeldt, L. (1961). The breeding biology of the Forest Wagtail *Motacilla indica* (Gmelin). *J. Bombay Nat. Hist. Soc.* **58**: 559-579.

Neumann, O. (1929). Neue Formen vom Bailundu-Land, Benguella. *Orn. Monatsber.* **37(6)**: 176-178.

Neunteufel, A. (1951). Observaciones sobre *Dromococcyx pavoninus* Pelzeln y el parasitismo de los cucúlidos. *Hornero* **9**: 288-290.

Nevill, A. (1984a). Fairy and Tree Martins in Otago. *Notornis* **31(2)**: 173-175.

Nevill, H. (1984b). The wagtail in Transkei Tribal Birdlore. *Bokmakierie* **36**: 110-111.

Nevill, H. (1987). The wagtail with a wimple. *Albatross* **289**: 3.

Newby, J.E. (1980). The birds of the Ouadi Rimé - Ouadi Achim Faunal Reserve: a contribution to the study of the Chadian avifauna. Part 2. *Malimbus* **2(1)**: 29-50.

Newman, D.L. (1958). A nesting of the Acadian Flycatcher. *Wilson Bull.* **70**: 130–144.

Newman, J.R., Novakova, E. & McClave, J.T. (1985). The influence of industrial air emissions on the nesting ecology of the House Martin *Delichon urbica* in Czechoslovakia. *Biol. Conserv.* **31**: 229-248.

Newman, K. (1970). Large Striped Pipit. *Witwatersrand Bird Club News* **71**: 6.

Newman, K. (1991). Further observations on the Shortclawed Lark. *Witwatersrand Bird Club News* **154**: 16-17.

Newman, K. (1996). *Newman's Birds of Southern Africa*. Southern Book Publishers, Halfway House, South Africa.

Newman, K., Johnston-Stewart, N. & Medland, B. (1992). *Birds of Malawi. A Supplement to Newman's Birds of Southern Africa*. Southern Book Publishers, Halfway House, South Africa.

Newton, I., Meek, E.R. & Little, B. (1978). Breeding ecology of the merlin in Northumberland. *British Birds* **71**: 376-398.

Newton, S.F. & Newton, A.V. (1997). The effect of rainfall and habitat on abundance and diversity of birds in a fenced protected area in the central Saudi Arabian desert. *J. Arid Environm.* **35**: 715-735.

Nhlane, M.E.D. (1990). Breeding biology of the African Pied Wagtail *Motacilla aguimp* in Blantyre, Malawi. *Ostrich* **61(1&2)**: 1-4.

Nhlane, M.E.D. (1992). The feeding behaviour of the African Pied Wagtail *Motacilla aguimp* on a sewage farm in Blantyre City. Pp. 397-402 in: Bennun (1992).

Nice, M.M. (1924). Extension of range of the Robin and Arkansas Kingbird in Oklahoma. *Auk* **41**: 565-568.

Nice, M.M. (1931). Notes on the twilight songs of the Scissor-tailed and Crested Flycatchers. *Auk* **48(1)**: 123-125.

Nice, M.M. & Collias, N.E. (1961). A nesting of the Least Flycatcher. *Auk* **78**: 145-149.

Nicéforo, M.H. (1947). Notas sobre aves de Colombia II. *Caldasia* **4**: 317-377.

Nicéforo, M.H. & Olivares, A. (1976). Additions to the Colombian avifauna. Part 6. Tyrannidae to Bombycillidae. *Lozania* **21**: 1-16.

Nicholl, M. (1980). Grey Wagtail breeding biology. *Tay Ringing Group Report* **1978-1979**: 40-44.

Nickell, W.P. (1949). A large nest of the Rough-winged Swallow. *Wilson Bull.* **61**: 188-189.

Nicolau-Guillaumet, P. (1965). L'Hirondelle rousseline (*Hirundo daurica rufula* Temm.) a niché en France continentale. *Vie Milieu* **16**: 1159-1174.

Nicolau-Guillaumet, P. (1999a). Cochevis theklae *Galerida theklae*. Pp. 176-177 in: Rocamora & Yeatman-Berthelot (1999).

Nicolau-Guillaumet, P. (1999b). Hirondelle rousseline *Hirundo daurica*. Pp. 180-181 in: Rocamora & Yeatman-Berthelot (1999).

Niederfriniger, O. (1973). Crag Martins nesting on buildings. *British Birds* **66**: 121-123.

Nielsen, L. (1959). Albert Lyrebird in the Blackall Ranges. *Emu* **59**: 249.

Nielsen, L. (1960). Bird notes from Queensland. *Austr. Bird Watcher* **1**: 109-112.

Nieminen, M., Rinne, J. & Vickholm, J. (1993). Kalliopääsky ja lämpimät yläkielekkeet. *Linnut* **28(1)**: 28-31.

Niethammer, G. (1955a). Zur Kennzeichnung von *Galerida cristata* und *G. theklae*. *J. Orn.* **96(4)**: 411-417.

Niethammer, G. (1955b). Zur Vogelwelt des Ennedi-Gebirges (Französisch-Äquatorial-Afrika). *Bonn Zool. Beitr.* **6**: 29-80.

Niethammer, G. (1956). Zur Vogelwelt Boliviens (Teil II: Passeres). *Bonn. Zool. Beitr.* **1-3**: 84-150.

Niethammer, G. (1963a). Book review: Heim de Balsac, H., und Noel Mayaud (1962): *Les Oiseaux du Nord-Ouest de l'Afrique*. *J. Orn.* **104(2)**: 258-260.

Niethammer, G. (1963b). Zur Vogelwelt des Hoggar-Gebirges (Zentrale Sahara). *Bonn. Zool. Beitr.* **14**: 129-150.

Niethammer, G. (1969). Am Nest der Namiblerche, *Ammomanes grayi*. *J. Orn.* **110**: 503-504.

Nievergelt, F., Berger, C. & Gremaud, J. (1999). Zweiter Nachweis des Waldpiepers *Anthus hodgsoni* in der Schweiz. [Second record of an Olive-backed Pipit *Anthus hodgsoni* in Switzerland]. *Orn. Beob.* **96(3)**: 153-156.

Nikander, P.J. (1994). Wie unterscheide ich die Heidelerche *Lullula arborea* von der Feldlerche *Alauda arvensis*? *Orn. Mitt.* **46(8)**: 206-207.

Nikolaus, G. (1987). *Distribution Atlas of Sudan's Birds with Notes on Habitat and Status*. Bonner Zoologische Monographien **25**. Zoologisches Forschunginstitut und Museum Alexander Koenig, Bonn.

Niles, D.M. (1972a). Determining age and sex of Purple Martins. *Bird-Banding* **43(2)**: 137-138.

Niles, D.M. (1972b). Molt cycles of Purple Martins (*Progne subis*). *Condor* **74(1)**: 61-71.

Niles, D.M. (1972c). *Adaptive Variation in Body Size and Skeletal Proportions of Horned Larks of the Southwestern United States*. PhD thesis, University of Kansas, Lawrence, Kansas.

Niles, D.M. (1973). Adaptive variation in body size and skeletal proportions of Horned Larks of the southwest United States. *Evolution* **27**: 405-426.

Nilsson, R.J., Kennedy, E.S. & West, J.A. (1994). The birdlife of South East Island (Rangatira), Chatham Islands, New Zealand. *Notornis* **41**(Suppl.): 109-125.

Nishigai, M. & Hirata, T. (1980). [*Oenanthe pleschanka* and *Motacilla alba ocularis* observed on Hekura I., Ishikawa Pref.]. *Tori* **29(2/3)**: 97-98. In Japanese with English summary.

Noble, G.K. (1916). The resident birds of Guadeloupe. *Bull. Mus. Comp. Zool., Harvard* **60(10)**: 359-396.

Nolte, K.R. & Fulbright, T.E. (1996). Nesting ecology of Scissor-tailed Flycatchers in south Texas. *Wilson Bull.* **108**: 302-316.

Norberg, R.A. (1991). The Flappet Lark *Mirafra rufocinnamomea* doubles its wingbeat rate to 24Hz in wing-clap display flight: a sexually selected feat. *J. Exper. Biol.* **159**: 515-523.

Norberg, R.A. (1994). Swallow tail streamer is a mechanical device for self-deflection of tail leading edge, enhancing aerodynamic efficiency and flight maneuverability. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **257**: 227-233.

Nores, M. (1986). Nuevos registros para aves de Argentina. [New records for Argentine birds]. *Hornero* **12(4)**: 304-307. In Spanish with English summary.

Nores, M. & Yzurieta, D. (1979). Una nueva especie y dos nuevas subespecies de aves (Passeriformes). *Misc. Acad. Nac. Cienc. Córdoba* **61**: 4-8.

Nores, M. & Yzurieta, D. (1980). *Aves de Ambientes Acuáticos de Córdoba y Centro de Argentina*. Secretaría de Estado de Agricultura y Ganadería (Dirección de Caza, Pesca y Actividades Acuáticas), Córdoba, Argentina.

Nores, M. & Yzurieta, D. (1984). Registro de aves en el sur de Bolivia. *Doñana Acta Vertebrata* **11(2)**: 327-337.

Nores, M. & Yzurieta, D. (1991). Lista y distribución de las aves de Santiago del Estero, Argentina. *Bol. Acad. Nac. Cienc. Córdoba* **59**: 157-196.

Nores, M., Salvador, S.A. & Yzurieta, D. (2000). Registros de aves de selva en Catamarca, Argentina. [Forest bird records in Catamarca, Argentina]. *Hornero* **15(2)**: 111-115. In Spanish with English summary.

Nores, M., Yzurieta, D. & Miatello, R. (1983). *Lista y Distribución de las Aves de Córdoba, Argentina*. Boletín de la Academia Nacional de Ciencias **56(1-2)**. 114 pp.

Norman, D.M. (1970). Grey Wagtails at Prawle. *Devon Birds* **23**: 10-15.

Norris, B.N. (1968). Welcome Swallows nesting in Christchurch. *Notornis* **15(3)**: 176.

Norris, L.L. & Morgenson, R. (1982). Nesting of Water Pipits in Sequoia and Kings Canyon National Parks. *Western Birds* **13(1-4)**: 39-40.

Norton, A.H. (1916). Notes on some Maine birds. *Auk* **33**: 376-383.

Norton, W.J.E. (1958). Notes on birds in the Elburz Mountains of North Persia. *Ibis* **100(2)**: 179-189.

Nörup, S. (1963). Danske Piberes Ynglebiologi. 1. Markpiberen (*Anthus c. campestris* (L.)). [Breeding biology of Danish pipits. 1. Tawny Pipit (*Anthus c. campestris* (L.))]. *Dan. Orn. Foren. Tidsvk.* **57(2)**: 110-117. In Danish with English summary.

Norvell, J.R. & Creighton, P.D. (1990). Foraging of Horned Larks and Water Pipits in alpine communities. *J. Field Orn.* **61(4)**: 434-440.

Novaes, F.C. (1978a). *Ornitologia do Território do Amapá*. Part II. Publicações Avulsas do Museu Paraense Emílio Goeldi (Zool.) **29**. 75 pp.

Novaes, F.C. (1978b). Sobre algumas aves pouco conhecidas da Amazonia brasileira. *Bol. Mus. Paraense Emílio Goeldi (Zool.)* **90**: 1-15.

Novaes, F.C. (1992). Bird observations in the State of Piaui, Brazil. *Goeldiana Zool.* **17**: 1-5.

Nowakowski, J.J. (2000). Spatial distribution of a Tree Pipit *Anthus trivialis* population from Lagiewnicki Forest (Lódz-Central Poland). *Avocetta* **24(2)**: 125-128.

Núñez, H. (1995). Ataque de *Agriornis livida* (Tyrannidae) a *Passer domesticus* (Ploceidae). *Bol. Chileno Orn.* **2**: 28.

Nussbaumer, M.A. (1992). Die Messbarkeit kleiner Vogelskelette am Beispiel der Feldlerche *Alauda arvensis* nebst Angaben zum Geschlechtsdimorphismus am Skelett. *Orn. Beob.* **89(4)**: 245-251.

Nuttall, R.J. (1992). Some observations of Fawncoloured Lark *Mirafra africanoides* behaviour. *Mirafra* **9(3-4)**: 63-64.

Nuttall, R.J. (1993). Vocal imitation of a Sabota Lark *Mirafra sabota*, with comments on some other species. *Mirafra* **10(2)**: 28-33.

Nuttall, R.J. (1996). Sightings of interest: Free State region. *Mirafra* **13(1)**: 20-24.

Nuttall, R.J. (1997). Sightings of interest: Free State and northern Cape regions. *Mirafra* **14(3&4)**: 13-18.

Nuttall, R.J. (2000). Vocal mimicry in individual Thick-billed Lark *Galerida magnirostris* and Yellow-bellied Eremomela *Eremomela icteropygialis*. *Mirafra* **17(4)**: 56-57.

Nyandoro, R. (1987). Comments on territorial behaviour and weights of Wire-tailed Swallows. *Honeyguide* **33**: 62-63.

O'Daniel, D.L. (1997). Observations at a nest of the Madagascar Wagtail *Motacilla flaviventris*. *Ostrich* **68(2)**: 19-22.

O'Donoghue, J.G. (1931). Note on the Victorian Lyrebird *Menura victoriae*. *Victorian Naturalist* **28**: 149-157.

O'Neill, J.P. & Parker, T.A. (1981). New subspecies of *Pipreola riefferii* and *Chlorospingus ophthalmicus* from Peru. *Bull. Brit. Orn. Club* **101(2)**: 294-299.

Oakleaf, B., Luce, B., Ritter, S. & Cerovski, A. (1992). *Wyoming Bird and Mammal Atlas*. Wyoming Game Fish Department, Lander, Wyoming.

Oates, H. (1991). A swallow tale. *Natal Midl. Bird Club Newsl.* **4**: 4-5.

Oatley, T.B. (1988). Waggi tales. *Bokmakierie* **40**: 120-121.

Oatley, T.B. (2000). Migrant European Swallows *Hirundo rustica* in southern Africa: a southern perspective. *Ostrich* **71(1&2)**: 205-209.

Oatley, T.B. (2002a). Striped Swallows. *Africa. Birds & Birding* **7(1)**: 20-22.

Oatley, T.B. (2002b). Cape Wagtail. *Africa. Birds & Birding* **7(2)**: 22-23.

Oatley, T.B. (2003). White-throated Swallow. *Africa. Birds & Birding* **8(5)**: 22-23.

Oberholser, H.C. (1974). *Birdlife of Texas*. 2 Vols. University of Texas Press, Austin, Texas.

Odderskaer, P., Prang, A., Elmegaard, N. & Andersen, P.N. (1997). *Skylark Reproduction in Pesticide Treated and Untreated Fields. Comparative Studies of Skylark* Alauda arvensis *Breeding Performance in Sprayed and Unsprayed Spring Barley Fields*. Pesticides Research **32**. Danish Environmental Protection Agency, Copenhagen. 72 pp.

Odderskaer, P., Prang, A., Poulsen, J.G., Andersen, P.N. & Elmegaard, N. (1997). Skylark (*Alauda arvensis*) utilisation of micro-habitats in spring barley fields. *Agric. Ecosyst. & Environm.* **62(1)**: 21-29.

Ödeen, A. & Alström, P. (2001). Evolution of secondary sexual traits in wagtails (genus *Motacilla*). In: Ödeen, A. (2001). *Effects of Post-glacial Range Expansions and Population Bottlenecks on Species Richness*. PhD thesis, Uppsala University, Uppsala.

Ogilvie-Grant, W.R. (1894). On the birds of the Philippine Islands - Part II. The highlands of North Luzon, 5000 feet. *Ibis* **Ser. 6, no. 6**: 501-522.

Ogle, D. (1986). The status and seasonality of birds in Nakhon Sawan Province, Thailand. *Nat. Hist. Bull. Siam Soc.* **34**: 115-143.

Ohlendorf, H.M. (1971). *Comparative Relationships Among Selected Flycatchers in Trans-Pecos, Texas*. PhD dissertation, Texas A&M University, College Station, Texas.

Ohlendorf, H.M. (1974). Competitive relationships among kingbirds (*Tyrannus*) in trans-Pecos Texas. *Wilson Bull.* **86**: 357-373.

Ohsako, Y. (1989). Sex allocation in parental care and sex-biased feeding in the Japanese Wagtail *Motacilla grandis*. *Jap. J. Orn.* **37(4)**: 198. (Abstract).

Ohsako, Y. (1996). [Summer distribution of *Motacilla* spp. and breeding of *M. alba lugens* in the Ono Basin, Fukui, (Japan)]. *Strix* **14**: 107-112. In Japanese with English summary.

Ohsako, Y. & Yamagishi, S. (1989). Pair relationships and female-female aggression in the occasionally bigamous Japanese Wagtail *Motacilla grandis*. *Jap. J. Orn.* **37(3)**: 89-101. In English with Japanese summary.

Ojeda, V. & Trejo, A. (2002). Primeros registros de nidificación en cavidades para tres especies de aves del bosque andino patagónico. [First cavity-nesting records for three Patagonian forest birds]. *Hornero* **17(2)**: 85-89. In Spanish with English summary.

Olafsson, E. (1983). [The Shore Lark *Eremophila alpestris* recorded in Iceland]. *Bliki* **1**: 40-41.

Olendorf, R. & Robinson, S.K. (2000). Effectiveness of nest defence in the Acadian Flycatcher *Empidonax virescens*. *Ibis* **142(3)**: 365-371.

Olioso, G. (1996). Le Pipit à gorge rousse *Anthus cervinus* en France. *Ornithos* **3(2)**: 63-67.

Olioso, G. & Cheylan, G. (1999). Alouette calandrelle *Calandrella brachydactyla*. Pp. 418-419 in: Rocamora & Yeatman-Berthelot (1999).

Olioso, G., Bence, P., Boutin, J., Cheylan, G., Dhermain, F. & Bergier, P. (1983). Les passereaux nicheurs des coussous de La Crau. *Biologie-Écologie Méditerranéenne* **10(1-2)**: 107-118.

Olivares, A. (1963). Notas sobre aves de los Andes orientales en Boyacá. *Bol. Soc. Venez. Cienc. Nat.* **25**: 91-125.

Olivares, A. (1964). Adiciones a las aves de la Comisaría del Vaupes (Colombia). *Caldasia* **9**: 150-184.

Olivares, A. (1971). Aves de la ladera oriental de los Andes orientales, Alto Río Cusiana, Boyacá, Colombia. *Caldasia* **11**: 203-226.

Oliver, D.W. (1975). A cause of decline in farmyard House Martin colonies. *Scottish Birds* **8**: 325-327.

Oliver, W.R.B. (1955). *New Zealand Birds*. 2nd edition. Reed, Wellington.

Olmos, F. & Pacheco, J.F. (2002). Redescoberta de *Pipra vilasboasi*, espécie desaparecida há 45 anos. *Atualidades Orn.* **107**: 3.

Olmos, F. & Pacheco, J.F. (2003). Rediscovery of Golden-crowned Manakin *Lepidothrix vilasboasi*. *Cotinga* **20**: 48-50.

Olrog, C.C. (1958). Notas ornitológicas sobre la colección del Instituto Miguel Lillo Tucumán. III. *Acta Zool. Lilloana* **15**: 5-19.

Olrog, C.C. (1963). *Lista y Distribución de las Aves Argentinas*. Universidad Nacional de Tucumán, Tucumán, Argentina.

Olrog, C.C. (1972). Causal ornithogeography of South America. Pp. 562-573 in: Voous (1972).

Olrog, C.C. (1979a). Notas ornitológicas del noroeste argentino (Aves, Passeriformes). *Neotrópica* **25(74)**: 125-126.

Olrog, C.C. (1979b). *Nueva Lista de la Avifauna Argentina*. Opera Lilloana **27**, Tucumán, Argentina.

Olrog, C.C. (1984). *Las Aves Argentinas*. Administración de Parques Nacionales, Buenos Aires.

O'Neill, J.P. & Parker, T.A. (1976). New subspecies for *Schizoeca fuliginosa* and *Uromyias agraphia* from Peru. *Bull. Brit. Orn. Club* **96(4)**: 136-141.

Olsen, K.M. (1991). Identification of Meadow and Red-throated Pipits. *British Birds* **84**: 513-514.

Olsen, K.M. (1999). Field identification of Tree and Olive-backed Pipit. *Alula* **5(2)**: 42-48.

Olson, D.H. & McDowell, M.K. (1983). A comparison of White-bearded Manakin (*Manacus manacus*) populations and lek systems in Suriname and Trinidad. *Auk* **100(3)**: 739-742.

Olson, S.L. (1970). Specializations of some carotenoid-bearing feathers. *Condor* **72(4)**: 424-430.

Olson, S.L. (1981). Natural history of vertebrates on the Brazilian islands of the mid South Atlantic. *Natl. Geogr. Soc. Res. Rep.* **13**: 481-492.
Olson, S.L. (1985). The fossil record of birds. Pp. 79-256 in: Farner, D.S., King, J.R. & Parkes, K.C. eds. (1985). *Avian Biology*. Vol. 8. Academic Press Inc., Orlando, Florida.
Olson, S.L. (1993). Contributions to avian biogeography from the archipelago and lowlands of Bocas del Toro, Panama. *Auk* **110**: 100-108.
Olson, S.L. (1997). Avian biogeography in the islands of the Pacific coast of western Panama. Pp. 69-82 in: Dickerman (1997).
Olson, S.L. & Hilgartner, W.B. (1982). Fossil and subfossil birds from the Bahamas. *Smithsonian Contrib. Paleobiol.* **48**: 22-60.
Oniki, Y. (1986). Nesting of the Blue and White Swallow *Notiochelidon cyanoleuca*. *Avicult. Mag.* **92(4)**: 186-189.
Oniki, Y. & Willis, E.O. (1980). A nest of the Ringed Gnatpipit *Corythopis torquata*. *Wilson Bull.* **92(1)**: 126-127.
Oniki, Y. & Willis, E.O. (1982). Breeding records of birds from Manaus, Brazil. Formicariidae to Pipridae. *Rev. Bras. Biol.* **42(3)**: 563-569.
Oniki, Y. & Willis, E.O. (1983a). A study of breeding birds of the Belém area, Brazil. Part IV. Formicariidae to Pipridae. *Ciên. Cult.* **35**: 1325-1328.
Oniki, Y. & Willis, E.O. (1983b). A study of breeding birds of the Belém area, Brazil. Part VI. Tyrannidae. *Ciênc. Cult.* **35**: 1880-1885.
Oniki, Y. & Willis, E.O. (2002). Descobertas ornitológicas através da Transamazônica e nordeste brasileiro. *Atualidades Orn.* **109**: 12.
Oo-u-kijo (1936). *Riparia paludicola brevicaudata* in Taiwan, Formosa. *Bot. Zool. Tokyo* **4**: 2065-2075.
Orban, Z. (1999). Desert type nest building behaviour of a Crested Lark (*Galerida cristata*) population nesting on flat roofs in Hungary. *Tuzok* **4(3)**: 63-72.
Ordano, M. (1998a). Primera descripción del nido del Pitajo Canela (*Ochthoeca oenanthoides*). *Nuestras Aves* **38**: 10-11.
Ordano, M. (1998b). Presencia de la Calandrita (*Stigmatura budytoides*) en Formosa, Argentina. *Nuestras Aves* **38**: 13.
Orejuela, J.E. (1985). Tropical forest birds of Colombia: a survey of problems and a plan for their conservation. Pp. 95-114 in: Diamond & Lovejoy (1985).
Orejuela, J.E., Cantillo, G. & Alberico, M. (1982). Observaciones del comportamiento reproductivo del saltarín *Allocotopterus deliciosus* (familia Pipridae, Aves) en Nariño, Colombia. *Cespedesia* **3(41&42)**(Suppl.): 69-79.
Orejuela, J.E., Raitt, R.J. & Álvarez, H. (1980). Differential use by North American migrants of three types of Colombian forests. Pp. 253–264 in Keast & Morton (1980).
Oren, D.C. (1982). A avifauna do arquipélago de Fernando de Noronha. *Bol. Mus. Paraense Emílio Goeldi* **118**: 1-22.
Oren, D.C. & Novaes, F.C. (1985). A new subspecies of White Bellbird *Procnias alba* (Hermann) from southeastern Amazonia. *Bull. Brit. Orn. Club* **105(1)**: 23-25.
Oren, D.C. & Parker, T.A. (1997). Avifauna of the Tapajós National Park and vicinity, Amazonian Brazil. Pp. 493-525 in: Remsen (1997).
Orians, G.H. (1978). On the status of *Xolmis dominicana*. *Auk* **95(2)**: 411.
Ormerod, S.J. (1989). The influence of weather on the body mass of migrating Swallows *Hirundo rustica* in south Wales. *Ringing & Migration* **10**: 65-74.
Ormerod, S.J. (1991). Pre-migratory and migratory movements of Swallows *Hirundo rustica* in Britain and Ireland. *Bird Study* **38**: 170-178.
Ormerod, S.J. & Tyler, S.J. (1987a). Aspects of the breeding ecology of Welsh Grey Wagtails *Motacilla cinerea*. *Bird Study* **34**: 43-51.
Ormerod, S.J. & Tyler, S.J. (1987b). Dippers and Grey Wagtails as indicators of stream acidity in upland Wales. Pp. 191-208 in: Diamond, A.W. & Filion, F.L. eds. (1987). *The Value of Birds*. ICBP Technical Publication **6**. ICBP, Cambridge.
Ormerod, S.J. & Tyler, S.J. (1991). The influence of stream acidification and riparian land-use on the feeding ecology of Grey Wagtails *Motacilla cinerea* in Wales. *Ibis* **133(1)**: 53-61.
Ormerod, S.J. & Tyler, S.J. (1992). Patterns of contamination by organochlorines and mercury in the eggs of two river passerines in Britain and Ireland with reference to individual PCB congeners. *Environ. Pollut.* **76(3)**: 233-243.
Ormerod, S.J. & Tyler, S.J. (1993). Birds as indicators of changes in water quality. Pp. 179-216 in: Greenwood, J.J.D. & Furness, R.J. eds. (1993). *Birds as Monitors of Environmental Change*. Chapman Hall, London.
Orr, Y. (1970). Temperature measurements at the nest of the Desert Lark (*Ammomanes deserti deserti*). *Condor* **72(4)**: 476-478.
Orta, J. & Romero, J.L. (1990). Noves dades sobre la distribució de l'Oreneta cua-rogenca *Hirundo daurica* a Catalunya. [New data on the distribution of the Red-rumped Swallow *Hirundo daurica* in Catalonia (NE Spain)]. *Butll. Grup Català d'Anellament* **7**: 27-31. In Catalan with English summary.
Ortega, C. (1998). *Cowbirds and Other Brood Parasites*. University of Arizona Press, Tucson, Arizona.
Ortiz, F.I. & Carrión, J.M. (1991). *Introducción a las Aves del Ecuador*. FECODES, Quito.
Ortiz von Halle, B. (1990). Additions to the avifauna of Colombia new species for Gorgona Island Pacific Ocean. *Caldasia* **16(77)**: 209-214.
Ortiz-Pulido, R. (1997). Actividades frugívoras de *Tyrannus forficatus* en un mosaico de vegetación durante la migración. *Orn. Neotropical* **8**: 237-239.
Osborne, P.E. & Tiggar, B.J. (1990). The status and distribution of birds in Lesotho. Unpublished report for the Nature Conservation Bureau Ltd, Newbury, Berkshire, UK.
Osburn, W. (1858). Notes on the birds of Jamaica. (Reprinted in *Gosse Bird Club Broadsheet* **39**: 5-7, 1982).
Osburn, W. (1869). Notes on the mountain birds of Jamaica. *Zoologist* **208**: 6709-6722, 6833-6841.
Oschadleus, D. (1996). Why do wagtails wag their tails? *Laniarius* **62**: 22.
Osiek, E.R. & Hustings, F. (1994). *Rode Lijst van Bedreigde en Kwetsbare Vogelsoorten in Nederland*. [*Red List of Threatened and Vulnerable Bird Species in The Netherlands*]. Technisch Rapport **12**. Vogelbescherming Nederland, Zeist, Netherlands. In Dutch with English summary.
Ossiannilsson, F. (1978). [White Wagtail, *Motacilla alba*, feeding fledgling Redstarts, *Phoenicurus phoenicurus*]. *Vår Fågelvärld* **37**: 137. In Swedish with English summary.
Ottema, O. (2002). Crimson Fruitcrow *Haematoderus militaris* feeding on *Cecropia sciadophylla*. *Cotinga* **18**: 103-104.
Otvos, I.S. & Stark, R.W. (1985). Arthropod food of some forest-inhabiting birds. *Can. Entomol.* **117**: 971-990.
Ouellet, H.R. ed. (1988). *Acta XIX Congressus Internationalis Ornithologici, Ottawa, 1986*. Vols. 1-2. University of Ottawa Press, Ottawa.
Ouellet, H.R. (1990). Notes on the iris colour in females of two manakins (*Pipridae*, Aves). *Bull. Brit. Orn. Club* **110(3)**: 140-141.
Pacheco, A. & Laverde, O. (2002). Comportamiento reproductivo del Saltarín Coludo (*Chiroxiphia lanceolata*) en un bosque secundario de Ibagué. *Bol. Soc. Antioqueña Orn.* **13(24-25)**: 62-72.
Pacheco, A. & Laverde, O. (2003). Selección de percha y sistema lek del Saltarín Coludo *Chirosiphia lanceolata*: Pipridae (Waterhouse 1830) en un bosque secundario del municipio de Ibagué. *Aleteo* **8**: 1-10.
Pacheco, C. (2002a). Arriero Coliblanco. *Agriornis andicola*. Pp. 173-174 in: Granizo (2002).
Pacheco, C. (2002b). Saltarín Cabeciamarillo. *Chloropipo flavicapilla*. Page 179 in: Granizo (2002).
Pacheco, C. (2002c). Tirano Tody Pechicanelo. *Hemitriccus cinnamomeipectus*. Page 304 in: Granizo (2002).
Pacheco, C. (2002d). Atila Ocráceo. *Attila torridus*. Pp. 308-309 in: Granizo (2002).
Pacheco, J.F. (1995). New distributional records for some birds from *várzea* forest at Mamirauá Reserve, western Brazilian Amazonia. *Ararajuba* **3**: 83-87.
Pacheco, J.F. & Bauer, C. (2001). As aves do Espírito Santo do Príncipe Maximiliano de Wied. *Atualidades Orn.* **99**: 6.
Pacheco, J.F. & da Fonseca, P.S.M. (2000). A admirável redescoberta de *Calyptura cristata* por Ricardo Parrini no contexto das preciosidades aladas da Mata Atlântica. *Atualidades Orn.* **93**: 6-7.
Pacheco, J.F. & da Fonseca, P.S.M. (2001). The remarkable rediscovery of the Kinglet Calyptura *Calyptura cristata*. *Cotinga* **16**: 48-51.
Pacheco, J.F. & Gonzaga, L.P. (1994). Tyrant-flycatchers as austral migrants at the state of Rio de Janeiro, Brazil. *Not. Faun.* **63**: 1-4.
Pacheco, J.F. & Laps, R.R. (2001). Notas sobre primeiros registros de seis espécies de Suboscines de Santa Catarina a partir de coleçoes seriadas, incluindo uma ocorrência não divulgada. [Notes on first records of six species of Suboscines for Santa Catarina state based on serial study skins, including one overlooked occurrence]. *Tangara* **1(4)**: 169-171. In Portuguese with English summary.
Pacheco, J.F. & Parrini, R. (1995). O "rei-dos-tangarás" (*Chiroxiphia caudata* x *Antilophia galeata*) no sul de Minas Gerais. *Atualidades Orn.* **66**: 10.
Pacheco, J.F. & Parrini, R. (1997). O limite norte de distribução do Tinguaçu-castanho (*Attila phoenicurus*) na Mata Atlântica. *Atualidades Orn.* **75**: 4.
Pacheco, J.F. & Simon, J.E. (1995). Variações no padrão de nidificação de *Fluvicola nengeta* Linnaeus, 1766 (Aves, Tyrannidae). *Rev. Bras. Biol.* **55**: 609-615.
Pacheco, J.F. & Whitney, B.M. (1995). Range extensions for some birds in northeastern Brazil. *Bull. Brit. Orn. Club* **115(3)**: 157-163.
Pacheco, J.F., Parrini, R., Whitney, B.M., da Fonseca, P.S.M. & Bauer, C. (1996). Novos registros de aves para o estado do Rio de Janeiro: Vale do Paraíba Norte. *Atualidades Orn.* **73**: 6.
Paetzold, R. (1990). Der Baumpieper - *Anthus trivialis*. *Neue Brehm. Büch.* **601**: 130.
Pajuelo, L., de Lope, F. & da Silva, E. (1992). Biología de la reproducción del Avión Común (*Delichon urbica*) en Badajoz, España. *Ardeola* **39**: 15-23.
Pakenham, R.H.W. (1979). *The Birds of Zanzibar and Pemba. An Annotated Check-list*. BOU Check-list **2**. British Ornithologists' Union, London.
Palmer, M.J., Phillips, B.F. & Smith, G.T. (1991). Applications of nonlinear models with random coefficients to growth data. *Biometrics* **47**: 623-635.
Palmer, P.C. (1988). Cave Swallow range continues to expand. *Amer. Birds* **42**: 174-176.
Palmer, R.S. (1949). *Maine Birds*. Bulletin of the Museum of Comparative Zoology **102**. 656 pp.
Palmgren, J., Rauste, V. & Salonen, V. (1978). Ruostepääsky *Hirundo daurica* Lemlandin Lagskärillä. *Lintumies* **13(4)**: 144-145.
Palmgren, P. (1960). The distribution of the Finnish bird fauna. Pp. 586-591 in: Bergman *et al.* (1960).
Paludan, K. (1959). *On the Birds of Afghanistan*. Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening **122**, Copenhagen. 333 pp.
Pang Bingzhang (1985). [Wintering habits of the Skylark *Alauda arvensis*]. *Chinese J. Zool.* **20(4)**: 40-42. In Chinese.
Pardo, R. & Gogorza y González, J. (1997). *Aves de las Islas Filipinas*. Librerías París-Valencia S.L., Valencia, Spain.
Pareigis, V.V. (1989). [The Crested Lark in Klaipeda]. *Acta Orn. Lituanica* **1**: 134.
Park, P. (1981a). A colour-banding study of Welcome Swallows breeding in southern Tasmania. *Corella* **5**: 37-41.
Park, P. (1981b). Results from a nesting study of Welcome Swallows in southern Tasmania. *Corella* **5**: 85-90.
Parker, T.A. (1981). Distribution and biology of the White-cheeked Cotinga *Zaratornis stresemanni*, a high Andean frugivore. *Bull. Brit. Orn. Club* **101(1)**: 256-265.
Parker, T.A. (1982a). Behavioral and distributional notes on some unusual birds of a lower montane cloud forest in Peru. *Bull. Brit. Orn. Club* **102(2)**: 63-70.
Parker, T.A. (1982b). Observations of some unusual rainforest and marsh birds in southeastern Peru. *Wilson Bull.* **94(4)**: 477-493.
Parker, T.A. (1984). Notes on the behavior of *Ramphotrigon* flycatchers. *Auk* **101(1)**: 186-188.
Parker, T.A. (1992a). Preliminary list of the birds of Cabeceras de Bilsa. Pp. 69-75 in: Parker & Carr (1992).
Parker, T.A. (1992b). Preliminary list of the birds of Manta Real. Pp. 96-102 in: Parker & Carr (1992).
Parker, T.A. (1992c). Birds of six forests in western Ecuador. Pp. 108-119 in: Parker & Carr (1992).
Parker, T.A. (1993a). Birds of the Columbia River Forest Reserve. Pp. 71-78 in: Parker, T.A., Holst, B.K., Emmons, L.H. & Meyer, J.R. eds. (1993). *A Biological Assessment of the Columbia River Forest Reserve, Toledo District, Belize*. Rapid Assessment Program Working Papers **3**. Conservation International, Washington, D.C.
Parker, T.A. (1993b). Bird species recorded at eight sites in the Bolivian Chaco. Pp. 82-91 in: Parker, T.A., Gentry, A.H., Foster, R.B., Emmons, L.H. & Remsen, J.V. (1993). *The Lowland Dry Forests of Santa Cruz, Bolivia: a Global Conservation Priority*. Rapid Assessment Program Working Papers **4**. Conservation International & Fundación Amigos de la Naturaleza, Washington, D.C.
Parker, T.A. (1997). Bird species recorded at three sites on the northern and western slopes of the Cordillera del Cóndor. Pp. 168-179 in: Schulenberg, T.S. & Awbrey, K. eds. (1997). *The Cordillera del Cóndor Region of Ecuador and Peru: a Biological Assessment*. Rapid Assessment Program Working Papers **7**. Conservation International, Washington, D.C.
Parker, T.A. & Carr, J.L. eds. (1992). *Status of Forest Remnants in the Cordillera de la Costa and Adjacent Areas of Southwestern Ecuador*. Rapid Assessment Program Working Papers **2**. Conservation International, Washington, D.C.
Parker, T.A. & Goerck, J.M. (1997). The importance of national parks and biological reserves to bird conservation in the Atlantic Forest region of Brazil. Pp. 527-541 in: Remsen (1997).
Parker, T.A. & Hoke, P. (2002). Lista preliminar de especies de aves registradas durante la Expedición RAP a la Zona de Pando, Bolivia, 1992. Pp. 113-124 in: Montambault, J.R. ed. (2002). *Informes de las Evaluaciones Biológicas Pampas del Heath, Perú, Alto Madidi, Bolivia y Pando, Bolivia*. Rapid Assessment Program Bulletin of Biological Assessment **24**. Conservation International, Washington, D.C.
Parker, T.A. & O'Neill, J.P. (1980). Notes on little known birds of the upper Urubamba Valley, southern Peru. *Auk* **97(1)**: 167-176.
Parker, T.A. & Parker, S.A. (1982). Behavioural and distributional notes on some unusual birds of a lower montane cloud forest in Peru. *Bull. Brit. Orn. Club* **102**: 63-70.
Parker, T.A. & Remsen, J.V. (1987). Fifty-two Amazonian bird species new to Bolivia. *Bull. Brit. Orn. Club* **107(3)**: 94-107.
Parker, T.A. & Rowlett, R.A. (1984). Some noteworthy records of birds from Bolivia. *Bull. Brit. Orn. Club* **104(3)**: 110-113.
Parker, T.A. & Willis, E.O. (1997). Notes on three tiny grassland flycatchers with comments on the disappearance of South American fire-diversified savannas. Pp. 549-556 in: Remsen (1997).
Parker, T.A. & Wust, W. (1994). Birds of the Cerros del Távara (300-900m). Pp. 83-90 in: Foster *et al.* (1994).
Parker, T.A., Castillo, A., Gell-Mann, M. & Rocha, O. (1991). Records of new and unusual birds from northern Bolivia. *Bull. Brit. Orn. Club* **111(3)**: 120-138.
Parker, T.A., Donahue, P.K. & Schulenberg, T.S. (1994). Birds of the Tambopata Reserve (Explorer's Inn Reserve). Pp. 106-124 in: Foster *et al.* (1994).
Parker, T.A., Foster, R.B., Emmons, L.H., Freed, P., Forsyth, A.B., Hoffman, B. & Gill, B.D. (1993). *A Biological Assessment of the Kanuku Mountain Region of Southwestern Guyana*. Rapid Assessment Program Working Papers **5**. Conservation International, Washington, D.C.
Parker, T.A., Kratter, A.W. & Wust, W. (1994). Birds of the Colpa de Guacamayos, Madre de Dios. Pp. 91-105 in: Foster *et al.* (1994).
Parker, T.A., Parker, S.A. & Plenge, M.A. (1982). *An Annotated Checklist of Peruvian Birds*. Buteo Books, Vermillion, South Dakota.
Parker, T.A., Remsen, J.V. & Heindel, J.A. (1980). Seven bird species new to Bolivia. *Bull. Brit. Orn. Club* **100(2)**: 160-162.
Parker, T.A., Schulenberg, T.S., Graves, G.R. & Braun, M.J. (1985). The avifauna of the Huancabamba region, northern Peru. Pp. 169-197 in: Buckley *et al.* (1985).
Parker, T.A., Schulenberg, T.S., Kessler, M. & Wust, W.H. (1995). Natural history and conservation of the endemic avifauna in north-west Peru. *Bird Conserv. Int.* **5(2/3)**: 201-231.
Parker, T.A., Schulengerg, T.S. & Wust, W. (1994). Birds of the lower Río Heath, including Pampas del Heath, Bolivia/Perú. Pp. 125-139 in: Foster *et al.* (1994).
Parker, T.A., Stotz, D.F. & Fitzpatrick, J.W. (1996). Ecological and distributional databases. Pp. 113-436 in: Stotz, D.F., Fitzpatrick, J.W., Parker, T.A. & Moskovits, D.K. (1996). *Neotropical Birds, Ecology and Conservation*. University of Chicago Press, Chicago & London.
Parker, T.A., Stotz, D.F. & Fitzpatrick, J.W. (1997). Notes on avian bamboo specialists in southwestern Amazonian Brazil. Pp. 543-547 in: Remsen (1997).
Parker, V. (1990). The mystery pipits. *Albatross* **304**: 17-18.
Parker, V. (1994). *Swaziland Bird Atlas 1985-1991*. Websters, Mbabane, Swaziland.
Parker, V. (1999). *The Atlas of the Birds of Sul do Save, Southern Mozambique*. Avian Demography Unit & Endangered Wildlife Trust, Cape Town & Johannesburg.
Parker, V. & de Boer, W.F. (2000). *Birds of the Maputo Special Reserve, Mozambique*. Bright Continent Guide **2**. Avian Demography Unit & Endangered Wildlife Trust, Cape Town & Johannesburg.
Parkes, K.C. (1963). Notes on some birds from Cuba and Isle of Pines. *Ann. Carnegie Mus.* **36**: 129-132.
Parkes, K.C. (1973). Distribution and generic placement of the Plain Tyrannulet *Inezia inornata*. *Condor* **75(2)**: 249-250.
Parkes, K.C. (1976). Geographic variation in the Common Tody-flycatcher (*Todirostrum cinereum*), with special reference to Middle America. *Nemouria* **18**: 1-9.
Parkes, K.C. (1982). Parallel geographic variation in three *Myiarchus* flycatchers in the Yucatán Peninsula and adjacent areas (Aves: Tyrannidae). *Ann. Carnegie Mus.* **51**: 1-16.
Parkes, K.C. (1987). Letter. Was the "Chinese" White-eyed River-martin an Oriental Pratincole? *Forktail* **3**: 68-69.
Parkes, K.C. (1988). Ageing and moult of Oriental Skylark. *British Birds* **81**: 654.
Parkes, K.C. (1993a). Systematics and nomenclature of the Andean Swallow "*Petrochelidon*" *andecola*. *Auk* **110(4)**: 947-950.
Parkes, K.C. (1993b). The name of the Ecuadorean subspecies of the Chestnut-collared Swallow *Hirundo rufocollaris*. *Bull. Brit. Orn. Club* **113(2)**: 119-120.

Parkes, K.C. & Panza, R.K. (1993). A new Amazonian subspecies of the Ruddy-tailed Flycatcher *Myiobus (Terenotriccus) erythrurus*. *Bull. Brit. Orn. Club* **113(1)**: 21-23.
Parkes, K.C. & Phillips, A.R. (1967). A new subspecies of the Yucatán Flycatcher *Myiarchus yucatanensis*. *Condor* **69(1)**: 78-81.
Parkes, K.C. & Phillips, A.R. (1999). A new subspecies of the Northern Beardless Tyrannulet *Camptostoma imberbe*. *Bull. Brit. Orn. Club* **119(1)**: 59-62.
Parmalee, P.W. & Klippel, W.E. (1982). Evidence of a boreal avifauna in middle Tennessee during the late Pleistocene. *Auk* **99**: 365-368.
Parmelee, D.F. & Rasmussen, P.C. (1994). Status of birds in Ushuaia Bay, Argentine Tierra del Fuego, in spring and summer. *Occas. Pap. Mus. Nat. Hist. Univ. Kansas* **168**: 1-24.
Parr, M. (2002). Golden-crowned Manakin mystery resolved. *Bird Calls* **6(2)**: 14.
Parrini, R., Raposo, M.A., Pacheco, J.F., Carvalhães, A.M.P., Melo-Júnior, T., Fonseca, P.S.M. & Minns, J.C. (1999). Birds of Chapada Diamantina, Bahia, Brazil. *Cotinga* **11**: 86–95.
Parslow, J.L.F. (1967). Change in status among birds in Britain and Ireland. Part 6. *British Birds* **60(12)**: 506-507.
Parsons, T.J., Olson, S.L. & Braun, M.J. (1993). Unidirectional spread of secondary sexual plumage traits across an avian hybrid zone. *Science* **260**: 1643-1646.
Parsons, T.J., Olson, S.L. & Braun, M.J. (1994). Hybrid zones and sexual selection: response. *Science* **265(5168)**: 122-123.
Pässler, R. (1922). In der Umgebung Coronels (Chile) beobachten Vögel. Beschreibung der Nester und Eier der Brütvögel. *J. Orn.* **70**: 430-482..
Pasteur, G. (1956). Notes sur la biologie de la reproduction du Cochevis de thekla. *Oiseau et RFO* **28(1)**: 73-76.
Pasteur, G. (1958). Premières observations sur le traquet, le bruant et l'ammomane du poste d'Aouïnet-Torkoz (bas Dra). *Bull. Soc. Sci. Nat. Phys. Maroc* **36**: 165-184.
Paterson, A. (1972). *Birds of the Bahamas*. Durell Publications & Stephen Greene Press Brattleboro, Vermont.
Paterson, M.L. (1959). South African Ornithological Society Richard's Pipit *Anthus novaeseelandiae* in southern Rhodesia. *Ostrich* **3**(Suppl.): 435-439.
Patten, D.E. (1982). Pied Wagtail driving other passerines from bird table. *British Birds* **75**: 34.
Patten, G.H. (1986). Exciting records. *Witwatersrand Bird Club News* **132**: 13.
Patterson, M.P. & Best, L.B. (1996). Bird abundance and nesting success in Iowa CRP fields: the importance of vegetation structure and composition. *Amer. Midl. Nat.* **135**: 153-167.
Patterson, R.M. (1981). Latitudinal variation in length of Barn Swallow tails in North America. *North Amer. Bird Bander* **6**: 151-154.
Pätzold, R. (1963). *Die Feldlerche (*Alauda arvensis *L.)*. Neue Brehm-Bücherei **323**. A. Ziemsen Verlag, Wittenberg Lutherstadt, Germany. 104 pp.
Pätzold, R. (1971). *Heidelerche und Haubenlerche*. Westarp-Wiss., Magdeburg, Germany.
Pätzold, R. (1979). Aufzeichnungen am Brutplatz der Balkanohrenlerche. *Falke* **26(4)**: 118-125.
Pätzold, R. (1981). Aufzucht, Mauser und Verhalten bei handaufgezogenen Balkanohrenlerchen. *Falke* **28(4)**: 114-123.
Pätzold, R. (1983). *Die Feldlerche*. Westarp-Wiss., Magdeburg, Germany.
Pätzold, R. (1984). *Der Wasserpieper*. Wittenberg Lutherstadt, Germany.
Pätzold, R. (1986). *Heidelerche und Haubenlerche*. Lullula arborea *und* Galerida cristata. Neue Brehm-Bücherei **440**. A. Ziemsen Verlag, Wittenberg Lutherstadt, Germany. 183 pp.
Pätzold, R. (1987). *Die Ohrenlerche* Eremophila alpestris. Neue Brehm-Bücherei **586**. A. Ziemsen Verlag, Wittenberg Lutherstadt, Germany. 144 pp.
Pätzold, R. (1991). Die Balkan-Ohrenlerche in Ponar/Westbalkan. Brutbiologische Angaben und bemerkenswerte Variationen dieser Daten. *Falke* **38(9)**: 292-302.
Pätzold, R. (1993). Die Steinlerche, *Ammomanes deserti algeriensis*, im Bergland von Tamerza. *Falke* **40(10)**: 336-342.
Pätzold, R. (1994). *Die Lerchen der Welt. Alaudidae*. Neue Brehm-Bücherei **617**. A. Ziemsen Verlag, Wittenberg Lutherstadt, Germany. 233 pp.
Pätzold, R. (2003). *Kompendium der Lerchen Alaudidae*. Jan Schimkat Medienpublizistik, Dresden, Germany.
Paulsen, B.E. (1978). Engelsk gulerle, *Motacilla flava flavissima*. [Yellow Wagtail, *Motacilla flava flavissima*, breeding in southern Norway]. *Vår Fuglefauna* **1(2)**: 81-87. In Norwegian with English summary.
Paulsen, B.E. (1993a). [Breeding biology of the Yellow Wagtail *Motacilla flava flavissima* in SW Norway]. *Fauna Norvegica (Ser. C, Cinclus)* **16(1)**: 31-35. In Norwegian with English summary.
Paulsen, B.E. (1993b). [Breeding distribution of the Yellow Wagtails *Motacilla flava flava* and *M. f. flavissima* in SW-Norway]. *Fauna Norvegica (Ser. C, Cinclus)* **16(1)**: 25-30. In Norweigan with English summary.
Pavel, V., Bureš, S., Weidinger, K. & Kovarik, P. (2000). Distraction displays in Meadow Pipit (*Anthus pratensis*) females in central and northern Europe. *Ethology* **106(11)**: 1007-1019.
Pavlova, A., Zink, R.M., Drovetski, S.V., Red'kin, Y. & Rohwer, S. (2003). Phylogeographic patterns in *Motacilla flava* and *Motacilla citreola*: species limits and population history. *Auk* **120(3)**: 744-758.
Pavlova, N.R. (1962). Characteristics of reproduction and the diet of the Sand Martin in the Oka Reserve. *Ornitologiya* **4**: 122-131.
Paxton, E.H., Sogge, M.K., McCarthey, T.D. & Keim, P. (2002). Nestling sex ratio in the Southwestern Willow Flycatcher. *Condor* **104(4)**: 877-881. In English with Spanish summary.
Payne, R.B. (1973). Wingflap dialects in the Flappet Lark *Mirafra rufocinnamomea*. *Ibis* **115**: 270-274.
Payne, R.B. (1978). Local dialects in the wingflaps of Flappet Larks *Mirafra rufocinnamomea*. *Ibis* **120(2)**: 204-207.
Payne, R.B. (1981). Persistence of local wingflap dialects in Flappet Larks *Mirafra rufocinnamomea*. *Ibis* **123(4)**: 507-511.
Payne, R.B. (1984). *Sexual Selection, Lek and Arena Behavior, and Sexual Size Dimorphism in Birds*. Ornithological Monographs **33**. American Ornithologists' Union, Washington, D.C.
Paynter, R.A. (1954). Interrelationships between clutch-size, brood-size, prefledging survival and weight in Kent Island Tree Swallows. *Bird-Banding* **25**: 35-58, 102-110, 136-148.
Paynter, R.A. (1955). *The Ornithogeography of the Yucatán Peninsula*. Peabody Museum of Natural History Yale University Bulletin **9**, New Haven, Connecticut. 345 pp.
Paynter, R.A. ed. (1957). *Biological Investigations in the Selva Lacandona, Chiapas, Mexico*. Bulletin of the Museum of Comparative Zoology **116(4)**, Cambridge, Massachusetts. 108 pp.
Paynter, R.A. (1995). *Nearctic Passerine Migrants in South America*. Publications of the Nuttall Ornithological Club **25**, Cambridge, Massachusetts. 126 pp.
Paynter, R.A. & Álvarez del Toro, M. (1957). Blue-and-white Swallow in Mexico. *Condor* **59(4)**: 268.
Paz, U. (1987). *The Birds of Israel*. Christopher Helm, Bromley, UK.
Pearce-Higgins, J.W. & Grant, M.C. (2002). The effects of grazing-related variation in habitat on the distribution of moorland Skylarks *Alauda arvensis* and Meadow Pipits *Anthus pratensis*. *Aspects Appl. Biol.* **67**: 155-163.
Pearman, M. (1994a). Neotropical Notebook. Colombia. *Cotinga* **1**: 26-27.
Pearman, M. (1994b). Neotropical Notebook. Brazil. *Cotinga* **2**: 30.
Pearman, M. & Abadie, E.L (1995). Mesopotamia grasslands and wetlands survey, 1991-1993: conservation of threatened birds and habitat in north-east Argentina. Unpublished report.
Pearson, D.L. (1971a). Vertical stratification of birds in a tropical dry forest. *Condor* **73(1)**: 40-55.
Pearson, D.J. (1971b). Weights of some Palearctic migrants in southern Uganda. *Ibis* **113(2)**: 173-184.
Pearson, D.J. (1983). East African Bird Report 1981: species report. *Scopus* **5(5)**: 129-153.
Pearson, D.J. (1990). East African Bird Report 1988: species report. *Scopus* **12(5)**: 105-126.
Pearson, D.J. & Backhurst, G.C. (1973). The head plumage of Eastern Yellow-headed Yellow Wagtails wintering in Nairobi, Kenya. *Ibis* **115(4)**: 589-591.
Pearson, D.J. & Lack, P.C. (1992). Migration patterns and habitat use by passerine and near-passerine migrant birds in eastern Africa. *Ibis* **134**(Suppl.): 89-98.
Pearson, D.J., Rodwell, S. & Turner, D. (1992). Friedmann's Lark resurfaces in Tsavo. *Kenya Birds* **1(2)**: 43-44.
Pearson, D.L. (1975). Range extensions and new records for bird species in Ecuador, Peru and Bolivia. *Condor* **77(1)**: 96-99.
Pearson, D.L. (1980). Bird migration in Amazonian Ecuador, Peru, and Bolivia. Pp. 273-283 in: Keast & Morton (1980).
Pearson, D.L. & Beletsky, L. (2000). *The Ecotravellers' Wildlife Guide to Ecuador and its Galápagos Islands*. Academic Press, London & San Diego.
Pearson, D.L. & Beletsky, L. (2001). *The Ecotravellers' Wildlife Guide to Perú*. Academic Press, London & San Diego.
Pearson, T.G. (1936). *Birds of America*. Garden City Publications, Garden City, New York.
Peck, G.K. & James, R.D. (1987). *Breeding Birds of Ontario: Nidiology and Distribution*. Vol. 2. Passerines. Royal Ontario Museum, Toronto.
Peck, G.K. & James, R.D. (1997). Breeding birds of Ontario: nidiology and distribution. Vol. 2. Passerines. (First revision - Part A: flycatchers to gnatcatchers). *Ontario Birds* **15(3)**: 95-107.
Pedersen, T. (2000). *Democratic Republic of Congo: a Bird Checklist*. Published privately.
Pedersen, T. & Herroelen, P. (1998). Striped Pipit *Anthus lineiventris* - a new species for the eastern D.R.C. *Afropavo* **3**: 2.
Pedroli, J.C. & Graf-Jaccottet, M. (1978). La croissance des jeunes Pipits farlouses *Anthus pratensis* au nid. [Growth of nestling Meadow Pipits *Anthus pratensis*]. *Alauda* **46(2)**: 171-176. In French with German and English summary.
Peer, B.D. & Sealy, S.G. (2000). Responses of Scissor-tailed Flycatchers (*Tyrannus forficatus*) to experimental cowbird parasitism. *Bird Behaviour* **13(2)**: 63-67.
Peer, K., Robertson, R.J. & Kempenaers, B. (2000). Reproductive anatomy and indices of quality in male Tree Swallows: the potential reproductive role of floaters. *Auk* **117(1)**: 74 81.
Pelzeln, A. von (1868-1871). *Zur Ornithologie Brasiliens: Resultate von Johann Natterers Reisen in den Jahren 1817 bis 1835*. A. Pichler's Witwe & Sohn, Vienna.
Penard, F.P. & Penard, A.P. (1910). *De Vogels van Guyana*. Vol. 2. Paramaribo, Guiana.
Penry, E.H. (1979). White-headed Saw-wing (*Psalidoprocne albiceps*) in Chingola. *Bull. Zambian Orn. Soc.* **11(1)**: 34.
Penry, E.H. (1986). The distribution and status of the South African Cliff Swallow (*Hirundo spilodera*) in Botswana. *Babbler* **12**: 9-13.
Penry, H. (1994). *Bird Atlas of Botswana*. University of Natal Press, Pietermaritzburg, South Africa.
Peña, M. & Weber, W.H. (2000). Reencuentro del Saltarín Cabecidorado (*Chloropipo flavicapilla*) en Antioquia. *Bol. Soc. Antioqueña Orn.* **11(20-21)**: 46-48.
de la Peña, M.R. (1979). *Enciclopedia de las Aves Argentinas*. VI. Colmegna, Santa Fe, Argentina.
de la Peña, M.R. (1980). Nidos de aves de Santa Fe. 4. *Hornero* **12(1)**: 72-74.
de la Peña, M.R. (1987). *Nidos y Huevos de Aves Argentinas*. Published privately, Santa Fe, Argentina.
de la Peña, M.R. (1988). *Guía de Aves Argentinas*. Vol. 5. Passeriformes. Dendrocolaptidae, Furnariidae, Formicariidae, Tyrannidae. Literature of Latin America, Buenos Aires.
de la Peña, M.R. (1989). *Guía de Aves Argentinas*. Vol. 6. Passeriformes. Rhinocryptidae, Cotingidae, Pipridae, Phytotomidae, Hirundinidae, Motacillidae, Cinclidae, Troglodytidae, Mimidae, Muscicapidae, Emberizidae, Parulidae, Vireonidae, Icteridae, Fringillidae, Ploceidae, Corvidae. Literature of Latin America, Buenos Aires.
de la Peña, M.R. (1995). *Ciclo Reproductivo de las Aves Argentinas*. Part 1. Centro de Publicaciones de la Universidad Nacional del Litoral, Santa Fe.
de la Peña, M.R. (1996). *Ciclo Reproductivo de las Aves Argentinas*. Part 2. Literature of Latin America, Buenos Aires.
de la Peña, M.R. (1997). *Lista y Distribución de las Aves de Santa Fe y Entre Ríos*. Monografía Especial **15**. Literature of Latin America, Buenos Aires.
de la Peña, M.R. (1999). *Nidos y Huevos de Aves Argentinas*. Fundación Hábitat y Desarrollo, Buenos Aires.
de la Peña, M.R. (2001a). Nidificación de algunas especies de aves en el este de la provincia de Catamarca, Argentina. *Hornero* **16(1)**: 17-21.
de la Peña, M.R. (2001b). Nidificación de aves en el noroeste argentino. *Nuestras Aves* **42**: 16-17.
de la Peña, M.R. & Rumboll, M. (1998). *Birds of Southern South America and Antarctica*. Harper-Collins, London.
Pepler, D. & Martin, R. (1997). Greater Striped Swallows feeding in the intertidal zone. *Promerops* **231**: 8.
Peredo, R. & Miranda, L. (2001). Nuevos registros para la avifauna del estuario de Río Lluta (Arcio, región de Tarapacá). *Bol. Chileno Orn.* **8**: 2-9.
Peres, C.A. & Whittaker, A. (1991). Annotated checklist of the bird species of the upper Rio Urucu, Amazonas, Brazil. *Bull. Brit. Orn. Club* **111(3)**: 156-171.
Pereyra, J.A. (1937). *Contribución al Estudio y Observaciones Ornitológicas de la Zona Norte de la Gobernación de La Pampa*. Memorias del Jardín Zoológico de La Plata **7**. 129 pp.
Pereyra, J.A. (1938). *Aves de la Zona Ribereña Nordeste de la Provincia de Buenos Aires*. Memorias del Jardín Zoológico de La Plata **9(2)**. 304 pp.
Pereyra, J.A. (1969). Avifauna argentina. Familia Hirundinidae: golondrinas. *Hornero* **11**: 1-19.
Pereyra, M.E. & Morton, M.L. (2001). Nestling growth and thermoregulatory development in subalpine Dusky Flycatchers. *Auk* **118(1)**: 116-136.
Pérez, C. & Petracci, P. (1997). Nidificación del Tuquito Gris (*Empidonomus aurantiatrocristatus*) en la provincia de Río Negro, Argentina. *Nuestras Aves* **36**: 6.
Pérez, E.S. & Villeda, M.L.C. (2000). Bird species found in Laguna del Tigre National Park, Petén, Guatemala during the RAP survey. Pp. 208-214 in: Bestelmeyer, B.T. & Alonso, L.E. eds. *A biological assessment of Laguna del Tigre National Park, Petén, Guatemala*. Conservation International, Washington, D.C.
Pérez, V. & Pérez, J.A.L. (1998). Andean Cock-of-the-rock *Rupicola peruviana* nest under a bridge. *Cotinga* **9**: 81-82.
Pérez del Val, J. (1996). *Las Aves de Bioko, Guinea Ecuatorial. Guía de Campo*. Edilesa, León, Spain.
Pérez-Tris, J. & Asensio, B. (1997). Migración e invernada de la Lavandera Boyera (*Motacilla flava*) en la Península Ibérica. [Migration and wintering of the Yellow Wagtail (*Motacilla flava*) in the Iberian Peninsula]. *Ardeola* **44(1)**: 71-78. In Spanish with English summary.
Peris, S.J. (1990). Peso y biometría de algunas aves del Chaco Húmedo (Presidente Hayes, Paraguay). *Orn. Neotropical* **1**: 31-32.
Peris, S.J. & Llanes, A. (1998). Breeding observations of Cave Swallows (*Hirundo fulva*) at two Cuban sites. *Orn. Neotropical* **9(2)**: 209-212.
Perlman, Y. (2001). Blyth's Pipit *Anthus godlewskii*: a new species for Thailand. *Forktail* **17**: 115-116.
van Perlo, B. (1995). *Birds of Eastern Africa*. Harper Collins Publishers, London.
Perray, D.J. (1978). Pied Wagtails persistently attacking dipper. *British Birds* **71**: 539.
Perrins, C.M., Lebreton, J.D. & Hirons, G.J.M. eds. (1991). *Bird Population Studies, Relevance to Conservation and Management*. Oxford University Press, Oxford.
Perry, A., Kessler, M. & Helme, N. (1997). Birds of the central Río Tuichi Valley, with emphasis on dry forest, Parque Nacional Madidi, Dpto. La Paz, Bolivia. Pp. 557-576 in: Remsen (1997).
Perry, E.F. & Andersen, D.E. (2003). Advantages of clustered nesting for Least Flycatchers in north-central Minnesota. *Condor* **105(4)**: 756-770. In English with Spanish summary.
Persson, C. (1973). The migration of Sand Martins *Riparia riparia* from Denmark and southern Scania. *Dan. Orn. Foren. Tidssk.* **67**: 25-34.
Persson, C. (1977). The early stages of the postnuptial moult in the White Wagtail *Motacilla alba*. *Ornis Scand.* **8**: 97-99.
Persson, C. (1987a). Sand Martin (*Riparia riparia*) populations in south-west Scania, Sweden, 1964-1984. *J. Zool., London* **1**: 619-637.
Persson, C. (1987b). Age structure, sex ratios and survival rates in a south Sand Martin *Riparia riparia* population, 1964 to 1984. *J. Zool., London* **1**: 639-670.
Persson, C. (1987c). Population processes in south-west Scanian Sand Martins (*Riparia riparia*). *J. Zool., London* **1**: 671-691.
Pescott, T. (1978). Tree Martins as cave nesters. *Austr. Bird Watcher* **7**: 273-276.
Pesente, M. (1991). Nidificazione della Calandrella, *Calandrella brachydactyla*, in coltivi della media pianura veronese. *Riv. Ital. Orn.* **61(1-2)**: 37-42.
Peter, J.M. (1997). Skylark *Alauda arvensis* imitates parrots. *Austr. Bird Watcher* **17(3)**: 156-157.
Peterjohn, B.G. (1989). *The Birds of Ohio*. Indiana University Press, Bloomington, Indiana.
Peterjohn, B.G., Sauer, J.R. & Robbins, C.S. (1995). Population trends from the North American Breeding Bird Survey. Pp. 3-39 in: Martin & Finch (1995).
Peters, W. (1999). Bird of the month. Red-capped Lark *Calandrella cinerea*. *Zambian Orn. Soc. Newsl.* **29(8)**: 7.
Petersen, A.J. (1955). The breeding cycle in the Bank Swallow. *Wilson Bull.* **67(4)**: 235-286.
Petersen, K.L. & Best, L.B. (1987). Effects of prescribed burning on nongame birds in a sagebrush community. *Wildl. Soc. Bull.* **15**: 317-329.
Petersen, P.C. & Mueller, A.J. (1979). Longevity and colony loyalty in Bank Swallows. *Bird-Banding* **50**: 69-70.
Petersen, W.R., Nikula, B.J. & Holt, D.W. (1986). First record of Brown-chested Martin for North America. *Amer. Birds* **40(2)**: 192-193.
Peterson, J.M.C. (1988a). Olive-sided Flycatcher, *Contopus borealis*. Pp. 244–245 in: Andrle, R.F. & Carroll, J.R. eds. (1988). *The Atlas of Breeding Birds in New York State*. Cornell University Press, Ithaca, New York.
Peterson, J.M.C. (1988b). Yellow-bellied Flycatcher, *Empidonax flaviventris*. Pp. 248–249 in: Andrle, R.F. & Carroll, J.R. eds. (1988). *The Atlas of Breeding Birds in New York State*. Cornell University Press, Ithaca, New York.
Peterson, J.M.C. & Fichtel, C. (1992). Olive-sided Flycatcher, *Contopus borealis*. Pp. 353–367 in: Schneider, K.J. & Pence, D.M. eds. (1992). *Migratory Nongame Birds of Management Concern in the Northeast*. US Fish & Wildlife Service, Newton Corner, Massachusetts.
Peterson, R.A. (1995). *The South Dakota Breeding Bird Atlas*. South Dakota Ornithologist Union, Aberdeen, South Dakota.
Peterson, R.T. (1947). *A Field Guide to the Birds (East)*. Houghton Mifflin Company, Boston, Massachusetts.

Peterson, R.T. & Chalif, E.L. (1973). *A Field Guide to Mexican Birds*. Houghton Mifflin Company, Boston & New York.
Petit, D.R., Lynch, J.F., Hutto, R.L., Blake, J.G. & Waide, R.B. (1993). Management and conservation of migratory landbirds overwintering in the Neotropics. Pp. 70–92 in: *Status and Management of Neotropical Migratory Birds: 1992 September 21–25; Estes Park, CO*. USDA Forest Service General Technical Report **RM-229**. Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.
Pétursson, G. (1989). American Pipits in Iceland. *British Birds* **82**: 225.
Petyt, C. (2003). The vanishing Rock Wren. *Forest & Bird* **310**: 22-25.
Pfeifer, R., Stadler, J. & Brandl, R. (2001). Die Schwanzlänge bei Stelzen *Motacilla*: Beziehungen zu Körpergröße, Lebensraum und Verhalten. [Tail length of wagtails (Genus *Motacilla*): correlates with body size, habitat type and behaviour]. *Orn. Anz.* **40(2&3)**: 173-181. In German with English summary.
Pfister, A.R. (1980). *Postfire Avian Ecology in Yellowstone National Park*. MSc thesis, Washington State University, Pullman, Washington.
Pfister, O. (2001). Birds recorded during visits to Ladakh, India, from 1994 to 1997. *Forktail* **17**: 81-90.
Phelps, W.H. & Phelps, W.H. Jr. (1948). Notas sobre aves venezolanas. *Bol. Soc. Venez. Cienc. Nat.* **11**: 189-210.
Phelps, W.H. & Phelps, W.H. Jr. (1950). *Lista de las Aves de Venezuela con su Distribución*. Parte 2. Passeriformes. Boletín de la Sociedad Venezolana de Ciencias Naturales **12(75)**. 427 pp.
Phelps, W.H. & Phelps, W.H. Jr. (1953). Eight new subspecies of birds from the Perijá Mountains, Venezuela. *Proc. Biol. Soc. Washington* **66**: 1-12.
Phelps, W.H. & Phelps, W.H. Jr. (1955). Seven new birds from Cerro de la Neblina, Territorio Amazonas, Venezuela. *Proc. Biol. Soc. Washington* **68**: 113-124.
Phelps, W.H. & Phelps, W.H. Jr. (1963). *Lista de las Aves de Venezuela con su Distribución*. Parte 2. Passeriformes. 2nd edition. Boletín de la Sociedad Venezolana de Ciencias Naturales **24(104/105)**. 479 pp.
Phillips, A.R. (1936). A nest of the Olive-sided Flycatcher. *Condor* **39(2)**: 92.
Phillips, A.R. (1948). Geographic variation in *Empidonax traillii*. *Auk* **65**: 507-514.
Phillips, A.R. (1960). La acrecencia de errores acerca de la ornitología de Mexico, con notas sobre *Myiarchus*. *An. Inst. Biol.* **30**: 355-357.
Phillips, A.R. (1966). Further systematic notes on Mexican birds. *Bull. Brit. Orn. Club* **86**: 103-112.
Phillips, A.R. (1986). *The Known Birds of North and Middle America. Distributions and Variation, Migrations, Changes, Hybrids, Etc*. Part 1. Hirundinidae to Mimidae; Certhiidae. Denver Museum of Natural History, Denver, Colorado.
Phillips, A.R. (1994a). A tentative key to the species of kingbirds, with distributional notes. *J. Field Orn.* **65**: 295-306.
Phillips, A.R. (1994b). *The Known Birds of North and Middle America* versus the current AOU list. *Auk* **111**: 770–773.
Phillips, A.R. & Lanyon, W.E. (1970). Additional notes on the flycatchers of eastern North America. *Bird-Banding* **41**: 190-197.
Phillips, A.R., Marshall, J. & Monson, G. (1964). *The Birds of Arizona*. University of Arizona Press, Tucson, Arizona.
Phillips, T. (2003). Great Crested Flycatcher. *Birdscope* **17(2)**: 4.
Phillips, W.W.A. (1950). Nests and eggs of Ceylon birds. *Ceylon J. Sci. (Biol. Sci.)* **24(1)**: 63-83.
Phillips, W.W.A. (1978). *Annotated Checklist of the Birds of Ceylon*. Revised edition. Wildlife & Nature Protection Society of Ceylon & Ceylon Bird Club, Colombo.
Pichorim, M., Bornschein, M.R. & Reinert, B.L. (1996). Aspectos da biologia reprodutiva de *Knipolegus nigerrimus* (Tyrannidae). [Aspects of the reproductive biology of the Velvety Black-tyrant (*Knipolegus nigerrimus*) (Tyrannidae)]. *Ararajuba* **4(1)**: 29-31. In Portuguese with English summary.
Pichorim, M., Uejima, A.M.K. & Gatto, C.A.F.R. (2000). Avifauna de um remanescente florestal do sudoeste do Estado do Paraná. Pp. 212-213 in: Straube *et al.* (2000). (Abstract).
Pickwell, G. (1931). *The Prairie Horned Lark*. Transactions of the Academy of Science of St. Louis **27**. 153 pp.
Pickwell, G. (1947). The American Pipit in its arctic-alpine home. *Auk* **64(1)**: 1-14.
Piechocki, R., Stubbe, M., Uhlenhaut, K. & Sunjaa, D. (1982). *Beitrage zur Avifauna der Mongolei. Teil 4. Passeriformes. Ergebnisse der Mongolisch-Deutschen Biologischen Expeditionen seit 1962, Nr. 124*. Mitteilungen aus dem Zoologischen Museum in Berlin **58**(Supplement). 53 pp.
Pierce, A.J. (1998). Disturbance of Plain Martin *Riparia paludicola* nests by Grey-headed Sparrow *Passer griseus swainsonii*. *Scopus* **20**: 51-52.
Pierce, M.A. & Mead, C.J. (1978). Haematozoa of British birds 4: blood parasites of birds from Wales. *J. Nat. Hist.* **12**: 361-363.
Pierce, M.A., Backhurst, G.C. & Backhurst, D.E.G. (1977). Haematozoa of East African birds III. Three years' observations on the blood parasites of birds from Ngulia. *East Afr. Wildl. J.* **15**: 71-79.
Pierce, R.J. (1994). A relict population of Rifleman in Northland. *Notornis* **41(4)**: 234.
Piertney, S.B., Shorey, L. & Hoglund, J. (2002). Characterization of microsatellite DNA markers in the White-bearded Manakin (*Manacus manacus*). *Mol. Ecol. Notes* **2(4)**: 504-505.
Pilastro, A. & Magnani, A. (1997). Weather conditions and fat accumulation dynamics in pre-migratory roosting Barn Swallows *Hirundo rustica*. *J. Avian Biol.* **28**: 338-344.
Pilastro, A. & Spina, F. (1999). Fat accumulation in pre-migratory roosting Barn Swallows in Europe. Pp. 219-228 in: Adams & Slotow (1999).
Pilastro, A., Spina, F. & Micheloni, P. (1998). Geographical variation in pre-migratory condition of Swallows *Hirundo rustica* in Italy. *Ringing & Migration* **19**: 67-74.
Pilcher, C.W.T., Gregory, G., Tye, A. & Ahmed, M.S. (1990). Additions to the country list produced by the Kuwait Avifaunal Survey, 1985-7. *Sandgrouse* **12**: 31-36.
Pinchon, R. (1963). *Les Oiseaux Faune des Antilles Françaises*. Museum d'Historie Naturelle, Fort-de-France, Martinique.
Pinchon, R.A. (1976). *Faune des Antilles Françaises. Les Oiseaux*. Fort-de-France, Martinique. 264 pp.
Pinel, H.W. (1980). Reproductive efficiency and site attachment of Tree Swallows and Mountain Bluebirds. *Blue Jay* **38**: 177-183.
Pinheiro, C.E.G. (2003). Does Mullerian mimicry work in nature? Experiments with butterflies and birds (Tyrannidae). *Biotropica* **35(3)**: 356-364.
Pinkowski, B. (1981). High density of avian cavity-nesters in Aspen. *Southwest. Nat.* **25**: 560-562.
Pinto, A.A. da Rosa & Lamm, D.W. (1958). Contribution to the study of the ornithology of Sul do Save, Mozambique. *Mem. Mus. Dr Álvaro de Castro* **4**: 107-167.
Pinto, O.M. de Oliveira (1940). Aves de Pernambuco. *Arq. Zool. São Paulo* **1**: 219-282.
Pinto, O.M. de Oliveira (1944). Sôbre as aves do distrito de Monte Alegre, Municipio de Amparo (São Paulo, Brasil). *Pap. Avuls. Dept. Zool. São Paulo* **6**: 117-150.
Pinto, O.M. de Oliveira (1948). Miscelânea ornitológica. *Bol. Mus. Paraense Emílio Goeldi* **10**: 301-311.
Pinto, O.M. de Oliveira (1953). Sobre a coleção Carlos Estevão de peles, ninhos e ovos das aves de Belém (Pará). *Pap. Avuls. Dept. Zool. São Paulo* **11**: 113-224.
Pinto, O.M. de Oliveira & Camargo, E.A. (1954). Resultados ornitológicos de uma expedição ao território de Acre pelo Departamento de Zoologia. *Pap. Avuls. Dept. Zool. São Paulo* **11**: 371-418.
Pinto, O.M. de Oliveira & Camargo, E.A. (1961). Resultados ornitologicos de quatro recentes expedições do Departamento de Zoologia ao nordeste do Brasil, com a descrição de seis novas subespecies. *Arq. Zool. São Paulo* **11(9)**: 193-284.
Piper, S.E. (1980). A ringing study of Long-tailed Wagtails in the Palmiet Nature Reserve. *Safring News* **9**: 10-13.
Piper, S.E. (1989). Breeding biology of the Long-tailed Wagtail *Motacilla clara*. *Ostrich* **14**(Suppl.): 7-15.
Piper, S.E. (1994). Estimates of minimum survival rates for territorial, adult Long-tailed Wagtails *Motacilla clara*. *J. Orn.* **135(3)**: 500.
Piper, S.E. (2001). Elucidating population structure in the Long-tailed Wagtail *Motacilla clara*: the use of the space-time diagram. *Ardea* **89(1)**: 113-121.
Piper, S.E. & Oatley, T.B. (1998). Two-tier survival patterns: territory holders vs. the rest. *Ostrich* **69(1&2)**: 22.
Piper, S.E. & Schultz, D.M. (1988). Monitoring territory, survival and breeding in the Long-tailed Wagtail. *Safring News* **17(2)**: 65-76.
Piper, S.E. & Schultz, D.M. (1989). Type, dimensionality and size of Long-tailed Wagtail territories. *Ostrich* **14**(Suppl.): 123-131.
Piratelli, A. & Mello, M.C. (2001). Biologia do Uirapuru-laranja (*Pipra fasciicauda*) no estado de Mato Grosso do Sul, Brasil. *Tangara* **1(4)**: 157-167.
Piratelli, A., Alves, V. & Lima, M. (2002). Birds of forest fragments inside sugar cane plantations in southeastern Brazil. Page 239 in: Anon. (2002a). (Abstract).
Pitches, A. (1997). Around the Orient. Thailand. Chinese dredging threat to Mekong River. *Bull. Oriental Bird Club* **35**: 59.
Pitman, C.R.S. (1931). The breeding habits and eggs of *Hirundo senegalensis senegalensis* (Linn.). *Ool. Rec.* **11**: 14-16.
Pitman, C.R.S. (1966). On movements, and a roost, of the African Pied Wagtail *Motacilla aguimp vidua* Sundevall. *Bull. Brit. Orn. Club* **86(5)**: 95.
Pittaway, R. (1994). Subspecies of the Horned Lark. *Ontario Birds* **12(3)**: 109-115.
Pittie, A. (1997). A review of birding notes from Andhra Pradesh, Karnataka, Kerala, Maharashtra and Tamil Nadu - 1997. *Mayura* **14**: 1-22.
Pizo, M.A. (1996). Interspecific aggression in the holenesting Long-tailed Tyrant, *Colonia colonus* (Aves, Tyrannidae). *Ciênc. Cult.* **48(4)**: 278-281.
Pizo, M.A. (2003). Observations on a nest of Russet-winged Spadebill *Platyrinchus leucoryphus* in the Brazilian Atlantic Forest. *Cotinga* **20**: 57-58. In English with Portuguese summary.
Pizo, M.A. & Aleixo, A. (1998). Lek behavior of the Gray-hooded Flycatcher. *Condor* **100(4)**: 726-731.
Pizo, M.A., Silva, W.R., Galetti, M. & Laps, R. (2002). Frugivory in cotingas of the Atlantic forest of southeast Brazil. *Ararajuba* **10(2)**: 177-185.
Pizzey, G. & Doyle, R. (1980). *A Field Guide to the Birds of Australia*. Collins, Sydney.
Pizzey, G. & Knight, F. (1997). *A Field Guide to the Birds of Australia*. Collins, Sydney.
Platania, S.P. & Clark, M.K. (1981). Rough-winged Swallow nesting in coastal North Carolina. *Chat* **45(4)**: 100-102.
Plenge, M.A. (1979). *Type Specimens of Birds in the Museo de Historia Natural "Javier Prado", Lima, Peru*. Occasional Papers of the Museum of Zoology of Louisiana State University. **53**.
du Plessis, G.J. (1990). Birds of the Orange Free State alpine belt. *Mirafra* **7(3)**: 77-83.
Plowes, D.C.H. (1944). A brief survey of the birds of Bloemhof District. *Ostrich* **15**: 81-103.
Plucinski, A. (1987a). Ohrenlerchen (*Eremophila alpestris*) im nordlichen Harzvorland. *Orn. Mitt.* **39(1)**: 14-15.
Plucinski, A. (1987b). Am Brutplatz der Ohrenlerche (*Eremophila alpestris*). *Orn. Mitt.* **39(3)**: 65-66.
Pollard, C.J.W. (1998). Dune Lark drinking water? *Lanioturdus* **31(3)**: 2-3.
Pollard, C.J.W. (2001). More on the White-throated Swallow in north-western Zimbabwe. *Honeyguide* **47(2)**: 186.
Pons, J.M. (1989). Contribution to the demographic study of four species of passerines (*Hirundo rustica, Delichon urbica, Parus major, Parus caeruleus*) in France. *Oiseau et RFO* **59**: 1-25.
duPont, J.E. (1971). *Philippine Birds*. Monograph Series **2**. Delaware Museum of Natural History, Greenville, Delaware.
Poole, A.F. & Gill, F.B. eds. (1994). *The Birds of North America*. Vol. 3. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Poole, A.F. & Gill, F.B. eds. (1995). *The Birds of North America*. Vol. 5. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Poole, A.F. & Gill, F.B. eds. (1997). *The Birds of North America*. Vol. 8. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Poole, A.F. & Gill, F.B. eds. (1999). *The Birds of North America*. Vol. 12. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Poole, A.F. & Gill, F.B. eds. (2000a). *The Birds of North America*. Vol. 13. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Poole, A.F. & Gill, F.B. eds. (2000b). *The Birds of North America*. Vol. 14. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Poole, A.F. & Gill, F.B. eds. (2002). *The birds of North America*. Vol. 16. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Poot, M., Engelen, F. & Siebes, M. (1986). [Roosts of Grey Wagtails *Motacilla cinerea*]. *Limosa* **59(2)**: 93-94. In Dutch with English summary.
Popenko, V.M. (1979). [Peculiarities of larks (Aves, Alaudidae) distribution in main biotopes of the Left Bank Steppe of the Ukraine]. *Vestnik Zoologii* **1979(2)**: 40-43. In Russian.
Pople, R.G., Burfield, I.J., Clay, R.P., Cope, D.R., Kennedy, C.P., López, B., Reyes, J., Warren, B. & Yagual, E. (1997). *Bird Surveys and Conservation Status of Three Sites in Western Ecuador. Final Report of Project Ortalis '96*. CSB Conservation Publications, Cambridge.
Portenko, L.A. (1973). *Birds of the Chukchi Peninsula and Wrangel Island*. Vol. 2. Nauka Publishers, St. Petersburg. (Translated into English by Smithsonian Institution Libraries & The National Science Foundation 1989).
Porter, I. (1986). Blinkwater. *Albatross* **288**: 7.
Porter, R. (1983). Autumn migration of passerines and near passerines at the Bosphorus, Turkey. *Sandgrouse* **5**: 45-74.
Porter, R.F., Christensen, S. & Schiermacker-Hansen, P. (1996). *Field Guide to the Birds of the Middle East*. T. & A.D. Poyser, London.
Portier, B., Lungren, C. & Ouéda, G.H. (2002). Birding in Burkina Faso, more than just birdwatching. *Dutch Birding* **24(3)**: 127-141.
Poulsen, B.O. (1992). Range extensions of Orange-cheeked Parrot and White-browed Purpletuft in Amazonian Venezuela. *Bull. Brit. Orn. Club* **112(4)**: 276-277.
Poulsen, B.O. (1994). Movements of single birds and mixed-species flocks between isolated fragments of cloud forest in Ecuador. *Stud. Neotrop. Fauna Environm.* **29(3)**: 149-160.
Poulsen, J.G. (1993). *Comparative Ecology of Skylarks* (Alauda arvensis *L.) on Arable Land*. MSc thesis, University of Aarhus, Aarhus, Denmark.
Poulsen, J.G. (1996a). Behaviour and parental care of Skylark *Alauda arvensis* chicks. *Ibis* **138(3)**: 525-531.
Poulsen, J.G. (1996b). Orientation of Skylark in field. *British Birds* **89(5)**: 235-236.
Poulsen, J.G. & Aebischer, N.J. (1996). Quantitative comparison of two methods of assessing diet of nestling Skylarks (*Alauda arvensis*). *Auk* **112(4)**: 1070-1073.
Poulsen, J.G., Sotherton, N.W. & Aebischer, N.J. (1998). Comparative nesting and feeding ecology of Skylarks *Alauda arvensis* on arable farmland in southern England with special reference to set-aside. *J. Appl. Ecol.* **35(1)**: 131-147.
Powell, G.V.N. & Bjork, R.D. (2004). Habitat linkages and the conservation of tropical biodiversity as indicated by seasonal migrations of Three-wattled Bellbirds. *Conserv. Biol.* **18(2)**: 500-509.
Powell, G.V.N., Rappole, J.H. & Sader, S.A. (1992). Neotropical migrant landbird use of lowland Atlantic habitats in Costa Rica: a test for remote sensing for identification of habitat. Pp. 287–298 in: Hagan & Johnston (1992).
Powys, V. (1995). Regional variation in the territorial songs of Superb Lyrebirds in the Central Tablelands of New South Wales. *Emu* **95(4)**: 280-289.
Pozza, D.D. (2002). Registros de avifauna ameaçada de extinção no nordeste do estado de São Paulo. *Ararajuba* **10(2)**: 241-243.
Pranaitis, A. (1990). Citrine Wagtails (*Motacilla citreola*) breed in Lithuania. *Acta Orn. Lituanica* **2**: 140-142. In English with Lithuanian summary.
Pratt, A. (1933). *The Lore of the Lyrebird*. Robertson & Mullens, Melbourne.
Pratt, H.D., Bruner, P.L. & Berrett, D.G. (1987). *A Field Guide to the Birds of Hawaii and the Tropical Pacific*. Princeton University Press, Princeton, New Jersey.
Pregill, G.K., Crombie, R.I., Steadman, D.W., Gordon, L.K., Davis, F.W. & Hilgartner, W.B. (1991). Living and late holocene fossil vertebrates, and the vegetation of the Cockpit country, Jamaica. *Atoll Res. Bull.* **353**: 119.
Preiswerk, G., Knaus, P. & Maumary, L. (2001). Oiseaux rares et observations inhabituelles en Suisse en 2000. [Rare and unusual bird observations in Switzerland in 2000]. *Nos Oiseaux* **48(4)**: 257-276. In French with English summary.
Prenn, F. (1937). Beobachtungen zur Lebensweise der Felsenschwalbe *Riparia rupestris* (Scop.). *J. Orn.* **85**: 577-586.
Prescott, D.R.C. (1987). Yellow-bellied Flycatcher. Pp. 254–255 in: Cadman, M.D., Eagles, P.F.J. & Helleiner, F.M. eds. (1987). *Atlas of the Breeding Birds of Ontario*. University of Waterloo Press, Waterloo, Ontario.
Prescott, D.R.C. (1997). *Status of the Sprague's Pipit* (Anthus spragueii) *in Alberta*. Alberta Environmental Protection & Wildlife Status Report **10**. Wildlife Management Division, Edmonton, Canada.
Prescott, D.R.C. & Davis, S.K. (1998). Status report on the Sprague's Pipit *Anthus spragueii* in Canada, July 1998. Unpublished report for the Committee on the Status of Endangered Wildlife in Canada.
Price, J., Droege, S. & Price, A. (1995). *The Summer Atlas of North American Birds*. Academic Press, London.
Priest, C.D. (1935). *Birds of Southern Rhodesia*. Vol. 3. Clowes & Son, London.
Prigogine, A. (1980). The altitudinal distribution of the avifauna in the Itombwe Forest (Zaire). Pp. 169-184 in: Johnson, D.N. (1980).
Prigogine, A. (1982). The status of *Anthus latistriatus* Jackson and the description of a new subspecies of *Anthus cinnamomeus* from Itombwe. *Gerfaut* **71**: 537-573.
Prigogine, A. (1985). Recently recognized bird species in the Afrotropical region - a critical review. Pp. 91-114 in: Schuchmann ed. (1985). *Proceedings of the International Symposium of African Vertebrates*. Forschungsinstitut und Museum Alexander Koenig, Bonn.
Prince, P.A. & Croxall, J.P. (1983). Birds of South Georgia: new records and re-evaluations of status. *Bull. Brit. Antarct. Surv.* **59**: 15-27.
Prince, P.A. & Poncet, S. (1996). South Georgia bird distribution. Section 2: map 2.1-2.33 in: Trathan, P.N., Daunt, F.H.J. & Murphy, E.J. eds. (1996). *South Georgia: an Ecological Atlas*. British Antarctic Survey, Cambridge, UK.

Pringle, V.L. (1948). Unusual nesting sites. *Ostrich* **19**: 157.
Pringle, V.L. (1989). Nest oddity. *Birding in SA* **41**: 120.
Prinzinger, R. & Siedle, K. (1986). Experimental proof of torpidity in young House Martins, *Delichon urbica*. *J. Orn.* **127**: 95-96.
Prinzinger, R. & Siedle, K. (1988a). Ontogeny of metabolism, thermoregulation and torpor in the House Martin (*Delichon urbica urbica* (L.)) and its ecological significance. *Oecologia* **761**: 307-312.
Prinzinger, R. & Siedle, K. (1988b). Ontogeny of thermoregulation in the House Martin (*Delichon urbica*). Pp. 1981-1991 in: Ouellet (1988).
Prinzinger, R., Hund, K. & Hochsieder, G. (1979). Brut- und Bebrütungstemperatur am Beispiel von Star und Mehlschwalbe: Zwei Bebrütungsparameter mit inverser Tagesperiodik. *Vogelwelt* **100**: 181-188.
Prodon, R. (1982). Sur la nidification, le régime alimentaire et les vocalisations de l'Hirondelle rousseline (*Hirundo daurica rufula* Temm.) en France. *Alauda* **50(3)**: 176-192.
Prozesky, O.P.M. (1963). Ornithological results of the Transvaal Museum Namibia Expedition, May 1959, and the subsequent trip to Sandwich Harbour during January 1960. *Ostrich* **34**: 78-91.
Prum, R.O. (1985). Observations on the White-fronted Manakin (*Pipra serena*) in Suriname. *Auk* **102(2)**: 384-387.
Prum, R.O. (1986). The displays of the White-throated Manakin *Corapipo gutturalis* in Suriname. *Ibis* **128(1)**: 91-102.
Prum, R.O. (1988). Historical relationships among avian forest areas of endemism in the Neotropics. Pp. 2562-2572 in: Ouellet (1988).
Prum, R.O. (1990a). Phylogenetic analysis of the evolution of display behavior of the Neotropical manakins (Aves: Pipridae). *Ethology* **84**: 202-231.
Prum, R.O. (1990b). A test of the monophyly of the manakins (Pipridae) and of the cotingas (Cotingidae) based on morphology. *Occas. Pap. Mus. Zool. Univ. Mich.* **723**: 1-44.
Prum, R.O. (1992). *Syringeal Morphology, Phylogeny, and Evolution of the Neotropical Manakins (Aves: Pipridae)*. American Museum Novitates **3043**. 65 pp.
Prum, R.O. (1994a). Phylogenetic analysis of the evolution of alternative social behavior in the manakins (Aves: Pipridae). *Evolution* **48(5)**: 1657-1675.
Prum, R.O. (1994b). Species status of the White-fronted Manakin, *Lepidothrix serena* (Pipridae), with comments on conservation biology. *Condor* **96(3)**: 692-702.
Prum, R.O. (1997). Phylogenetic tests of alternative intersexual selection mechanisms: trait macroevolution in a polygynous clade (Aves: Pipridae). *Amer. Naturalist* **149(4)**: 668-692.
Prum, R.O. (1998). Sexual selection and the evolution of mechanical sound production in manakins (Aves: Pipridae). *Anim. Behav.* **55(4)**: 977-994.
Prum, R.O. (2000). Phylogeny, sexual selection and behavioral evolution of the manakins (Pipridae) and cotingas (Cotingidae). Pp. 105-127 in: Alves *et al.* (2000).
Prum, R.O. (2001). A new genus for the Andean Green Pihas (Cotingidae). *Ibis* **143(2)**: 307-309.
Prum, R.O. & Johnson, A.E. (1987). Display behavior, foraging ecology, and systematics of the Golden-winged Manakin (*Masius chrysopterus*). *Wilson Bull.* **99(4)**: 521-539.
Prum, R.O. & Lanyon, W.E. (1989). Monophyly and phylogeny of the *Schiffornis* group (Tyrannoidea). *Condor* **91(2)**: 444-461.
Prum, R.O., Kaplan, J.D. & Pierson, J.E. (1996). Display behavior and natural history of the Yellow-crowned Manakin (*Heterocercus flavivertex*: Pipridae). *Condor* **98(4)**: 722-735.
Prum, R.O., Rice, N.H., Mobley, J.A. & Dimmick, W.W. (2000). A preliminary phylogenetic hypothesis for the cotingas (Cotingidae) based on mitochondrial DNA. *Auk* **117(1)**: 236-241.
Pulgarín, P.C. (2002). Notas sobre el nido, el comportamiento y la dieta de los pichones del Cabezón Canelo (*Pachyramphus cinnamomeus*). *Bol. Soc. Antioqueña Orn.* **13(24-25)**: 41-45.
Pulido, V. (1991). *El Libro Rojo de la Fauna Silvestre del Perú*. INIAA, WWF & US Fish & Wildlife Service, Lima.
Purandare, K. (2002). Brown Crake *Amaurornis akool* Sykes feeding on the eggs of the Large Pied Wagtail *Motacilla maderaspatensis* Gmelin. *J. Bombay Nat. Hist. Soc.* **99(1)**: 119.
Purchon, R.D. (1948). The nesting activities of the swallow. *Proc. Zool. Soc. London* **118**: 146-170.
Pycraft, W.P. (1905). Some points in the anatomy of *Acanthidositta chloris*, with some remarks on the systematic position of the genera *Acanthidositta* and *Xenicus*. *Ibis* **Ser. 8, no. 47**: 603-621.
Pycraft, W.P. (1906). Contributions to the osteology of birds. Part VIII. The "tracheophone" passeres: with remarks on the families allied thereto. *Proc. Zool. Soc. London* **1906**: 133-159.
Pye, T. & Bonner, W.N. (1980). Feral brown rats, *Rattus norvegicus*, in South Georgia (South Atlantic Ocean). *J. Zool.* **192**: 237-255.
Pyle, P. (1997a). *Identification Guide to North American Birds*. Part 1. Columbidae to Ploceidae. Slate Creek Press, Bolinas, California.
Pyle, P. (1997b). A further examination of wing and tail formulae in *Empidonax* and *Contopus* flycatchers. Pp. 147-154 in: Dickerman (1997).
Pyle, P. (1997c). Molt limits in North American passerines. *North Amer. Bird Bander* **22**: 49-89.
Pyle, P., Howell, S.N.G., Yunick, R.P. & DeSante, D.F. (1987). *Identification Guide to North American Passerines*. Slate Creek Press, Bolinas, California.
Quatro, J. (2001). Galo-da-serra-equatoriano *Rupicola aequatorialis*. *Atualidades Orn.* **103**: 11.
Quelch, J.J. (1892). Position of the caruncle and method of song of the bell-bird. *Timehri (New Ser.)* **6**: 164-166.
Quickelberge, C.D. (1967). The racial taxonomy of south-east African populations of the Long-billed Lark. *Ann. Cape Prov. Mus. (Nat. Hist.)* **6**: 39-46.
Quickelberge, C.D. (1970a). Variational patterns and races of the Clapper Lark *Mirafra apiata* (Vieillot). *Ann. Cape Prov. Mus. (Nat. Hist.)* **8(3)**: 25-37.
Quickelberge, C.D. (1970b). Taxonomic notes on the Thick-billed Lark *Calandrella magnirostris* (Stephens). *Durban Mus. Novit.* **8(18)**: 353-362.
Quickelberge, C.D. (1972a). The role played by birds in the lives of southern Nguni tribesmen. *Ostrich* **8**(Suppl.): 487-495.
Quickelberge, C.D. (1972b). Results of two ornithological expeditions to Lesotho. *Durban Mus. Novit.* **9(16)**: 251-278.
Quinney, T.E. (1983). Tree Swallows cross a polygyny threshold. *Auk* **100**: 750-754.
Quinney, T.E. (1986). Male and female parental care in Tree Swallows. *Wilson Bull.* **98**: 147-150.
Quinney, T.E. & Ankney, C.D. (1985). Prey size selection by Tree Swallows. *Auk* **102**: 245-250.
Quinney, T.E., Hussell, D.J.T. & Ankney, C.D. (1986). Sources of variation in growth of Tree Swallows. *Auk* **103**: 389-400.
Quiroga, C., Olivera, M. & Martínez, O. (1998). Registros ornitológicos destacables de 1996-1997 en el Valle de La Paz, Prov. Murillo, Dpto. La Paz. Pp. 113-117 in: Sagot & Guerrero (1998). (Panel discussion).
Rabacci, R. (1981). La Rondine Rossica in Italia. *Picus* **7**: 44-47.
Rabor, D.S. (1977). *Philippine Birds & Mammals*. University of the Philippines Press, Quezon City.
Radermacher, W. (1970). Langjährige Beobachtungen an der Rauchschwalbe (*Hirundo rustica*). *Charadrius* **6**: 7-23.
Radermacher, W. (1989). Weitere Beobachtungen an der Rauchschwalben (*Hirundo rustica*). *Charadrius* **25**: 179-188.
Raffaele, H.A. (1989). *A Guide to the Birds of Puerto Rico and the Virgin Islands*. Princeton University Press, Princeton & London.
Raffaele, H.A., Wiley, J., Garrido, O., Keith, A. & Raffaele, J. (1998). *A Guide to the Birds of the West Indies*. Princeton University, Princeton, New Jersey.
Raffaele, H.A., Wiley, J., Garrido, O., Keith, A. & Raffaele, J. (2003). *Birds of the West Indies*. Christopher Helm, London.
Ragger, M. (2000). Siedlungsdichte und Habitatnutzung der Heidelerche (*Lullula arborea*) an der Thermenlinie (Niederösterreich). [Breeding density and habitat use of the Woodlark (*Lullula arborea*) on the Thermenlinie (Lower Austria)]. *Egretta* **43(2)**: 89-111.
Raikow, R.J. (1978). The appendicular myology and its taxonomic significance in the passerine suborder Menurae. *Amer. Zool.* **18(3)**: 377. (Abstract).
Raikow, R.J. (1984). Hindlimb myology and phylogenetic position of the New Zealand wrens. *Amer. Zool.* **24(3)**: 83A. (Abstract).
Raikow, R.J. (1985). Systematic and functional aspects of the locomotor system of the scrub-birds, *Atrichornis*, and lyrebirds, *Menura* (Passeriformes: Atrichornithidae and Menuridae). *Records Austr. Mus.* **37(3-4)**: 211-228.
Raikow, R.J. (1987). *Hindlimb Myology and Evolution of the Old World Suboscine Passerine Birds (Acanthisittidae, Pittidae, Philepittidae, Eurylaimidae)*. Ornithological Monographs **41**. American Ornithologists' Union, Washington, D.C. 81 pp.
Raja, N.A., Davidson, P., Bean, N., Drijvers, R., Showler, D.A. & Barker, C. (1999). The birds of Palas, North-west Frontier Province, Pakistan. *Forktail* **15**: 77-85.
Ralph, C.P. & Chaplin, S.J. (1973). Some birds of Isla Punta Arenas, Pacific Coast, Colombia. *Condor* **75(3)**: 357-359.
Ramadan-Jaradi, G. (1988). Notes on some birds of the United Arab Emirates. *Sandgrouse* **10**: 81-84.
Ramadan-Jaradi, G. & Ramadan-Jaradi, M. (1999). An updated checklist of the birds of Lebanon. *Sandgrouse* **21(2)**: 132-170.
Ramanitra, N.A. (1995). Inventaire préliminaire de l'avifaune du Tsingy de Bemaraha. *Working Group on Birds in the Madagascar Region Newsletter* **5(1)**: 7-10.
Ramesh, G., Bhaskar, G. & Murali, G. (1988). Lyrebird - a good mimicrician. *Myforest* **24(3)**: 183-184.
Ramírez, M.G. & Arias, J.C. (1995). Características reproductivas del Saltarín *Allocotopterus deliciosus* en la Reserva Natural La Planada. *Bol. Soc. Antioqueña Orn.* **6(11)**: 18-21.
Ramos, M.A. (1988). Eco-evolutionary aspects of bird movements in the northern Neotropical region. Pp. 251-293 in: Ouellet (1988).
Ramstack, J.M., Murphy, M.T. & Palmer, M.R. (1998). Comparative reproductive biology of three species of swallows in a common environment. *Wilson Bull.* **110(2)**: 233-243.
Rand, A.L. (1936). *The Distribution and Habits of Madagascar Birds: a Summary of Field Notes of the Mission Zoologique Franco-Anglo-Américaine à Madagascar*. Bulletin of the American Museum of Natural History **72**, New York. 357 pp.
Rand, A.L. (1951). *Birds from Liberia. With a Discussion of Barriers between Upper and Lower Guinea Subspecies*. Fieldiana Zoology **32(9)**. 93 pp.
Rand, A.L. & Gilliard, E.T. (1967). *Handbook of New Guinea Birds*. Weidenfeld & Nicholson, London.
Rand, A.L., Friedmann, H. & Traylor, M.A. (1959). *Birds from Gabon and Moyen Congo*. Fieldiana Zoology **41(2)**. 191 pp.
Randler, C. (1997). Untersuchungen am Beispiel des Wegzuges von Ringeltaube *Columba palumbus* und Wiesenpieper *Anthus pratensis* im mittleren Neckarraum, Baden-Wuerttemberg. *Vogelwelt* **118(5)**: 291-295
Rands, M.R.W. (1991). Conserving threatened birds: an overview of the species and the threats. Pp. 594-633 in: Perrins *et al.* (1991).
Raphael, M.G., Morrison, M.L. & Yoder-Williams, M.P. (1987). Breeding bird populations during twenty-five years of postfire succession in the Sierra Nevada. *Condor* **89(3)**: 614-626.
Rands, M.R.W., Rands, G.F. & Porter, R.F. (1987). *Birds in the Yemen Arab Republic*. Report of the Ornithological Society of the Middle East Expedition 1985. ICBP, Cambridge.
Raphael, M.G., Rosenberg, K.V. & Marcot, B.G. (1988). Large-scale changes in bird populations of Douglas-fir forests, northwestern California. *Bird Conserv.* **3**: 63–83.
Raposo, M.A., Mazar Barnett, J., Kirwan, G.M. & Parrini, R. (2002). New data concerning the distribution, behaviour, ecology and taxonomic relationships of Minas Gerais Tyrannulet *Phylloscartes roquettei*. *Bird Conserv. Int.* **12(3)**: 241-253.
Rappole, J.H. (1992). Density, philopatry, and population estimates for songbird migrants wintering in Veracruz. Pp. 337-344 in: Hagan & Johnston (1992).
Rappole, J.H. & Warner, D.W. (1980). Ecological aspects of avian migrant behavior in Veracruz, Mexico. Pp. 353-393 in: Keast & Morton (1980).
Rappole, J.H., Morton, E.S., Lovejoy, T.E. & Ruos, J.L. (1993). *Nearctic Avian Migrants in the Neotropics*. US Fish & Wildlife Service, Washington, D.C.
Rappole, J.H., Morton, E.S., Lovejoy, T.E. & Ruos, J.L. (1995). *Nearctic Avian Migrants in the Neotropics*. 2nd edition. Conservation and Research Center, National Zoological Park, Smithsonian Institution, Front Royal, Virginia.
Rappole, J.H., Morton, E.S. & Ramos, M.A. (1992). Density, philopatry, and population estimates for songbird migrants wintering in Veracruz. Pp. 337–344 in: Hagan & Johnston (1992).
Rasmussen, E.V. (1981). Breeding numbers and habitat selection of Woodlarks *Lullula arborea* at Zealand. *Dan. Orn. Foren. Tidssk.* **75(3-4)**: 115-120.
Rasmussen, J.F., Rahbek, C., Poulsen, B.O., Poulsen, M.K. & Bloch, H. (1996). Distributional records and natural history notes on threatened and little known birds of southern Ecuador. *Bull. Brit. Orn. Club* **116(1)**: 26-46.
Rasmussen, P.C. & Anderton, J.C. (2004). *Birds of South Asia: the Ripley Guide*. 2 Vols. Lynx Edicions, Barcelona.
Ratcliffe, N., Monteiro, L.R. & Hazevoet, C.J. (1999). Status of Raso Lark *Alauda razae* with notes on threats and foraging behaviour. *Bird Conserv. Int.* **9(1)**: 43-46.
Rauste, V. & Salonen, V. (1978). Mongoliankirvinen *Anthus godlewskii* tavattu Suomessa. [*Anthus godlewskii* recorded in Finland]. *Ornis Fennica* **55(2)**: 84-85. In Finnish with English summary.
Rauter, C.M. & Reyer, H. (1997). Incubation pattern and foraging efforts in the female Water Pipit *Anthus spinoletta*. *Ibis* **139(3)**: 441-446.
Rauter, C.M., Reyer, H. & Bollmann, K. (2002). Selection through predation, snowfall and microclimate on nest-site preferences in the Water Pipit *Anthus spinoletta*. *Ibis* **144(3)**: 433-444.
Rawdon, B.B. (2002). Use of artificial nesting site by Black Saw-wing Swallow, *Psalidoprocne holomelas*. *Ostrich* **73(3&4)**: 175.
Rea, A.M. (1969). Species, age, and sex determination in the genus *Tyrannus*. *Western Bird Bander* **44**: 32-35.
Rea, A.M. (1983). *A River No More*. University of Arizona Press, Tucson, Arizona.
Read, A.C. (1909). From the Isle of Pines. *Oologist* **26(5)**: 75.
Read, A.C. (1911a). Nesting records, McKinley, Isle of Pines, Cuba. *Oologist* **28(1)**: 5.
Read, A.C. (1911b). Migration notes from the Isle of Pines. *Oologist* **28(1)**: 7.
Read, A.C. (1912). Birds observed on the Isle of Pines, Cuba, 1912. *Oologist* **30(8)**: 130-131.
Read, A.C. (1914). The Cuban Martin (*Progne cryptoleuca*). *Isle Pines News* **6**: 4.
Read, A.F. (1991). Passerine polygyny: a role for parasites? *Amer. Naturalist* **138(2)**: 434-459.
Read, M. (1994). Jungle gymnastics: the bizarre courtship antics of manakins. *Birder's World* **8(2)**: 40-43.
Reeves, R.R., Stewart, B.S. & Leatherwood, S. (1992). *Sierra Club Handbook of Seals and Sirenians*. Sierra Club Books, San Francisco, California.
Regalado, P. (2002). Cuba's Giant Kingbird. *World Birdwatch* **24(4)**: 14-15.
Régnier, D. (1999). Première nidification de l'Hirondelle de rochers *Ptyonoprogne rupestris* en Bourgogne. *Alauda* **67(2)**: 156.
Regosin, J.V. (1998). Scissor-tailed Flycatcher (*Tyrannus forficatus*). No. **342** in: Poole, A.F. & Gill, F.B. eds. (1998). *The Birds of North America*. Vol. 9. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Regosin, J.V. & Pruett-Jones, S. (2001). Sexual selection and tail-length dimorphism in Scissor-tailed Flycatchers. *Auk* **118(1)**: 167-175.
Rehsteiner, U., Geisser, H. & Reyer, H. (1998). Singing and mating success in Water Pipits: one specific song element makes all the difference. *Anim. Behav.* **55**: 1471-1481.
Reilly, P.N. (1970). Nesting of the Superb Lyrebird in Sherbrooke Forest, Victoria. *Emu* **70**: 73-78.
Reilly, P.N. (1988). *The Lyrebird: a Natural History*. New South Wales University Press, Kensington.
Reilly, P.N. & Garnett, W.J. (1973). Nesting of Fairy Martins in culverts. *Emu* **43**: 126-130.
Reilly, P.N., Brooker, M.G. & Johnstone, G.W. (1975). Birds of the southwest Nullarbor Plain. *Emu* **75**: 73-76.
Reis, G.C., Cortelletti, J.M., Bressan, D.A. & Marchiori, J.N.C. (1997). Registro das aves observadas no "Morro do Elefante" em Santa Maria e primeiro registro de *Antilophia galeata* no RS. Page 38 in: Anon. (1996e). (Abstract).
Remold, H.G. & Ramos Neto, M.B. (1995). A nest of the Restinga Tyrannulet *Phylloscartes kronei*. *Bull. Brit. Orn. Club* **115**: 239-240.
Remsen, J.V. (1977). A third locality for the Dusky-chested Flycatcher *Tyrannopsis luteiventris* for Colombia. *Bull. Brit. Orn. Club* **97**: 93-94.
Remsen, J.V. (1978). *Bird Species of Special Concern in California*. Wildlife Management Branch, Administrative Report **78-1**. California Department of Fish & Game, Sacramento, California.
Remsen, J.V. (1984). Natural history notes on some poorly-known Bolivian birds. *Gerfaut* **74**: 163-179.
Remsen, J.V. (1985). Community organization and ecology of birds of high elevation humid forest of the Bolivian Andes. Pp. 733-755 in: Buckley *et al.* (1985).
Remsen, J.V. ed. (1997). *Studies in Neotropical Ornithology Honoring Ted Parker*. Ornithological Monographs **48**. American Ornithologists' Union, Washington, D.C.
Remsen, J.V. & Parker, T.A. (1995). Bolivia has the opportunity to create the planet's richest park for terrestrial biota. *Bird Conserv. Int.* **5(2/3)**: 181-200.
Remsen, J.V. & Traylor, M.A. (1983). Additions to the avifauna of Bolivia, part 2. *Condor* **85(1)**: 95-98.
Remsen, J.V. & Traylor, M.A. (1989). *An Annotated List of the Birds of Bolivia*. Buteo Books, Vermillion, South Dakota.
Remsen, J.V., Parker, T.A. & Ridgely, R.S. (1982). Natural history notes on some poorly-known Bolivian birds. Part 1. *Gerfaut* **72**: 77-87.
Remsen, J.V., Rocha, O., Schmitt, C.G. & Schmitt, D.C. (1991). Zoogeography and geographic variation of *Platyrinchus mystaceus* in Bolivia and Peru, and the circum-Amazonian distribution pattern. *Orn. Neotropical* **2**: 77-83.
Remsen, J.V., Schmitt, C.G. & Schmitt, D.C. (1988). Natural history notes on some poorly-known Bolivian birds. Part 3. *Gerfaut* **78**: 363-381.

Rendahl, H. (1963). Die Zugverhältnisse der schwedischen Lerchen. Mit Berücksichtigung der Ergebnisse von den finnischen Beringungen. *Arkiv. för Zool.* **16(15)**: 279-313.
Rendell, W.B. (1987). *A Comparative Study of the Breeding Ecology and Nest Site Characteristics in Natural and Nest-box Populations of Tree Swallows*. Bsc thesis, Queen's University, Kingston, Canada.
Rendell, W.B. (1993). Intraspecific killing observed in Tree Swallows, *Tachycineta bicolor*. *Can. Field-Nat.* **107**: 227-228.
Rendell, W.B. & Robertson, R.J. (1989). Nest-site characteristics, reproductive success and cavity availability for Tree Swallows breeding in natural cavities. *Condor* **91(4)**: 875-885.
Rendell, W.B. & Robertson, R.J. (1990). Influence of forest edge on nest-site selection by Tree Swallows. *Wilson Bull.* **102**: 634-644.
Rendell, W.B. & Robertson, R.J. (1993). Cavity size, clutch-size and the breeding ecology of the Tree Swallow *Tachycineta bicolor*. *Ibis* **135(3)**: 305-310.
Rendell, W.B. & Robertson, R.J. (1994). Defense of extra nest-sites by a cavity nesting bird, the Tree Swallow *Tachycineta bicolor*. *Ardea* **82**: 273-285.
Rendell, W.B. & Verbeek, A.M. (1996a). Old nest material in nest boxes of Tree Swallows: effects on nest-site choice and nest building. *Auk* **113(2)**: 319-328.
Rendell, W.B. & Verbeek, A.M. (1996b). Old nest material in nest boxes of Tree Swallows: effects on reproductive success. *Condor* **98(1)**: 142-152.
Renjifo, L.M. (1991). Abundancias de aves frugívoras grandes y depredadoras de semillas en un bosque alto andino, implicaciones para su conservación. No. **107** in: Anon. (1991). (Abstract).
Renjifo, L.M. (1994). First records of the Bay-vented Cotinga *Doliornis sclateri* in Colombia. *Bull. Brit. Orn. Club* **114(2)**: 101-103.
Renjifo, L.M. & López, B. (2002). *Attila torridus*. Pp. 349-350 in: Renjifo *et al.* (2002).
Renjifo, L.M., Franco, A.M., Amaya, J.D., Kattan, G.H. & López, B. eds. (2002). *Libro Rojo de Aves de Colombia*. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt y Ministerio del Medio Ambiente, Bogotá.
Renjifo, L.M., Servat, G.P., Goerck, J.M., Loiselle, B.A. & Blake, J.G. (1997). Patterns of species composition and endemism in the northern Neotropics: a case for conservation of montane avifaunas. Pp. 577-594 in: Remsen (1997).
Rens, L. (1999). Marievale - the surviving wetland. *Bokmakierie* **187**: 29-30.
Restrepo, C. & Gómez, N. (1998). Responses of understory birds to anthropogenic edges in a neotropical montane forest. *Ecol. Appl.* **8**: 170-183.
Restrepo, C., Salaman, P. & Cuervo, A.M. (2002). *Pipreola chlorolepidota*. Pp. 354-355 in: Renjifo *et al.* (2002).
Rey, N.R. (2001). Presencia estival del Sobrepuesto (*Lessonia rufa*) y la Bandurria Austral (*Theristicus melanopis*) en el centro de la provincia de Buenos Aires, Argentina. *Nuestras Aves* **41**: 5-6.
Reyer, H.U., Bollmann, K., Schlaepfer, A.R., Schymainda, A. & Klecack, G. (1997). Ecological determinants of extrapair fertilizations and egg dumping in Alpine Water Pipits (*Anthus spinoletta*). *Behav. Ecol.* **8(5)**: 534-543.
Reynard, G.B., Garrido, O. & Sutton, R.L. (1993). Taxonomic revision of the Greater Antillean Pewee. *Wilson Bull.* **105(2)**: 217-227.
Reynaud, P.A. (1998). Changes in understory avifauna along the Sinnamary River (French Guyana, South America). *Orn. Neotropical* **9**: 51-70.
Reynolds, J.F. (1975). Nest building of Striped Swallows *Hirundo abyssinica*. *Bull. East Afr. Nat. Hist. Soc.* **1975**: 90.
Reynolds, J.F. (1977). Thermo-regulatory problems of birds nesting in arid areas in East Africa: a review. *Scopus* **1**: 57-68.
Reynolds, T.D. & Shorey, D.P. (1984). Unusual behavior of the Horned Lark. *Western Birds* **14(4)**: 209-210.
Rezanov, A.G. (1981). [Feeding behaviour and modes of feeding in the White Wagtail *Motacilla alba* (Passeriformes, Motacillidae)]. *Zoologischeskii Zhurnal* **60(4)**: 548-556. In Russian with English summary.
Rezende, E.L., López-Calleja, M.V. & Bozinovic, F. (2001). Standard and comparative energetics of a small avian herbivore (*Phytotoma rara*). *Auk* **118(3)**: 781-785.
Rheinwald, G. (1970). Die Einwirkung der Witterungskatastrophe Angang Juni 1969 auf die Mehlschwalben verschiedener Altersklassen in Riet. *Vogelwelt* **91**: 150-153.
Rheinwald, G. (1971). Gewichtsentwicklung nestjunger Mehlschwalben bei verschiedenen Witterungsbedingungen. *Charadrius* **7**: 114-120.
Rheinwald, G. (1973). Die Flügellänge der Mehlschwalbe: Altersabhängigkeit, Geschlechtsunterschied und Vergleich zweier Populationen. *Bonn. Zool. Beitr.* **24**: 374-386.
Rheinwald, G. (1975a). The pattern of settling distances in a population of House Martins. *Ardea* **63**: 136-145.
Rheinwald, G. (1975b). House Martins roosting on wing. *Vogelwelt* **96**: 221-224.
Rheinwald, G. (1977). Inzucht-Verpaarungen bei Mehlschwalben. *Bonn. Zool. Beitr.* **28**: 299-303.
Rheinwald, G. (1979). Brutbiologie der Mehlschwalbe im Bereich der Voreifel. *Vogelwelt* **100**: 85-107.
Rheinwald, G. (1991). [White Wagtails raised young Black Redstarts]. *Vogelwelt* **112(5)**: 212-214. In German with English summary.
Rheinwald, G. & Gutscher, H. (1969a). Dispersion und Ortstreue der Mehlschwalbe. *Vogelwelt* **90**: 121-140.
Rheinwald, G. & Gutscher, H. (1969b). Der Alter der Mehlschwalbe in Riet. *Vogelwarte* **25**: 141-147.
Rheinwald, G. & Schulze-Hagen, K. (1972). Vergleichende Untersuchungen zur Gewichtsentwicklung von Rauch- und Mehlschwalbe (*Hirundo rustica, Delichon urbica*) bei verschiedenen Witterungsbedingungen. *Charadrius* **8**: 74-81.
Rheinwald, G., Gutscher, H. & Hörmeyer, K. (1976). Einfluss des Alters der Mehlschwalbe auf ihre Brut. *Vogelwarte* **28**: 190-206.
Ribault, J.P. (1982). Biologie de reproduction de quelques populations d'Hirondelles (*Hirundo rustica*) en Alsace de 1973 à 1980. *Ciconia* **6**: 23-52.
Ribeiro, B. de A., Goulart, M.F. & Marini, M.Â. (2002). Aspectos da territorialidade de *Knipolegus lophotes* (Tyrannidae, Fluvicolinae) em sue período reprodutivo. [Aspects of *Knipolegus lophotes* (Tyrannidae, Fluvicolinae) territoriality in its breeding season]. *Ararajuba* **10(2)**: 231-235. In Portuguese with English summary.
Rich, P.V., McEvey, A.R. & Baird, R.F. (1985). Osteological comparison of the scrub-birds, *Atrichornis*, and lyrebirds, *Menura* (Passeriformes: Atrichornithidae and Menuridae). *Records Austr. Mus.* **37(3-4)**: 165-191.
Richardson, C. (1990). *The Birds of the United Arab Emirates*. Hobby Publications, Dubai & Warrington.
Richmond, S.M. (1953). The attraction of Purple Martins to an urban location in western Oregon. *Condor* **55(5)**: 225-249.
Richter, K. (1998). Auswirkungen von Pflegemassnahmen auf den Brutbestand der Heidelerche (*Lullula arborea*) und Zippammer (*Emberiza cia*) in Trockenstandorten von Unterfranken. *Acta Orn., Jena* **4(1)**: 29-39.
Ricklefs, R.E. (1967). Relative growth, body constituents, and energy content of nestling Barn Swallows and Red-winged Blackbirds. *Auk* **84**: 560-570.
Ricklefs, R.E. (1971). Foraging behavior of Mangrove Swallows at Barro Colorado Island. *Auk* **88(3)**: 635-651.
Ricklefs, R.E. (1972). Latitudinal variation in breeding productivity of the Rough-winged Swallow. *Auk* **89(4)**: 826-836.
Ricklefs, R.E. & Cox, G.W. (1977). Morphological similarity and ecological overlap among passerine birds on St. Kitts, British West Indies. *Oikos* **29**: 60-66.
Riddell, D. & Taylor, A. (1984). Fairy Martin at Cape Reinga. *Notornis* **31(3)**: 224.
Riddiford, N. (1977). Age determination of autumn Tawny Pipits. *British Birds* **70**: 83-84.
Riddiford, N. & Ellis, P. (1988). Calls of Pechora Pipit. *British Birds* **81(9)**: 469-470.
Ridgely, R.S. (1980). Notes on some rare or previously unrecorded birds in Ecuador with additional information on identification and habitat. *Amer. Birds* **34(3)**: 242-248.
Ridgely, R.S. (1981). *A Guide to the Birds of Panama*. Princeton University Press, Princeton, New Jersey.
Ridgely, R.S. & Gaulin, S.J.C. (1980). The birds of Finca Merenberg, Huila Department, Colombia. *Condor* **82(4)**: 378-391.
Ridgely, R.S. & Greenfield, P.J. (2001). *The Birds of Ecuador*. Vols. 1-2. Christopher Helm, London.
Ridgely, R.S. & Gwynne, J.A. (1989). *A Guide to the Birds of Panama with Costa Rica, Nicaragua, and Honduras*. Princeton University Press, Princeton, New Jersey.
Ridgely, R.S. & Tudor, G. (1989). *The Birds of South America*. Vol. 1. University of Texas Press, Austin, Texas.
Ridgely, R.S. & Tudor, G. (1994). *The Birds of South America*. Vol. 2. University of Texas Press, Austin, Texas.
Ridgely, R.S., Greenfield, P.J. & Guerrero, M. (1998). *Una Lista Anotada de las Aves del Ecuador Continental. An Annotated List of the Birds of Mainland Ecuador*. CECIA, Quito. In Spanish and English.
Ridgway, R. (1891). Notes on some birds from the interior of Honduras. *Proc. US Natl. Mus.* **868**: 467-471.
Ridgway, R. (1893). Remarks on the avian genus *Myiarchus*, with special reference to *M. yucatanensis* Lawrence. *Proc US Natl. Mus.* **16**: 605-608.
Ridgway, R. (1904). *The Birds of North and Middle America*. US National Museum Bulletin **50(3)**. Smithsonian Institution, Washington, D.C. 801 pp.
Ridgway, R. (1905). Descriptions of some new genera of Tyrannidae, Pipridae, and Cotingidae. *Proc. Biol. Soc. Washington* **18**: 207-210.
Ridgway, R. (1907). *The Birds of North and Middle America*. US National Museum Bulletin **50(4)**. Smithsonian Institution, Washington, D.C. 973 pp.
Riede, K. (2001). *Global Register of Migratory Species. Database, GIS Maps and Threat Analysis*. Federal Agency for Nature Conservation, Bonn.
Riedel, W. (1995). Zur Biologie der Haubenlerche (*Galerida cristata*) im mittleren Neckarraum nach 1945. *Orn. Jahresh. Baden-Württemb.* **11(2)**: 63-73.
Rieder, M. & Aubrecht, G. (1994). Die Haubenlerche (*Galerida cristata*) hat ihre Brutgebiete in Oberösterreich aufgegeben. Dokumentation zur Roten Liste gefährdeter Brutvogel. [The Crested Lark (*Galerida cristata*) abandoned breeding in upper Austria. Documentation for the Red List of threatened breeding birds]. *Vogelkundl. Nachrichten Osterreich* **2(1)**: 17-21.
Rietkerk, F. & Wacher, T. (1996). The birds of Thumamah, Central Province, Saudi Arabia. *Sandgrouse* **18(1)**: 24-52.
Rijke, A.M., Jesser, W.A., Evans, S.W. & Bouwman, H. (2000). Water repellency and feather structure of the Blue Swallow *Hirundo atrocaerulea*. *Ostrich* **71(1&2)**: 143-145.
Riley, H.T., Bryant, D.M., Carter, R.E. & Parkin, D.T. (1995). Extra-pair fertilizations and paternity defence in House Martins, *Delichon urbica*. *Anim. Behav.* **49**: 495-509.
Riley, J. (1997). *Biological Surveys and Conservation Priorities on the Sangihe and Talaud Islands, Indonesia*. CSB Conservation Publications, Cambridge.
Riley, J. & Mole, J. (2001). The birds of Gunung Ambang Nature Reserve, North Sulawesi, Indonesia. *Forktail* **17**: 57-66.
Riley, J.H. (1905). List of birds collected or observed during the Bahama Expedition of the Geographic Society of Baltimore. *Auk* **22**: 349-360.
Riley, J.H. (1938). *Birds from Siam and the Malay Peninsula in the United States National Museum Collected by Drs. Hugh M. Smith and William L. Abbott*. US National Museum Bulletin **172**. Smithsonian Institution, Wahington D.C. 581 pp.
Riley, S. (1989). Crested Lark using "anvil". *British Birds* **82(1)**: 30-31.
Rimmer, C.C., Almonte, J., Garrido, E., Mejia, D.A., Milagros, M. & Wieczoreck, P.R. (2003). Bird records in a montane forest fragment of western Sierra de Neiba, Domnican Republic. *J. Carib. Orn.* **16(1)**: 55-60.
Riney, T. (1953). Notes on habitat and behaviour of the Rock Wren subspecies *Xenicus gilviventris rineyi* Falla. *Notornis* **5(6)**: 186-188.
Ringleben, H. (1957). Bergpieper (*Anthus s.spinoletta* (L.)) in Niedersachsen. [Migration and habitat preferences of *Anthus s. spinoletta* in Lower Saxony, Germany]. *Ber. Naturhist. Ges. Hannover* **103**: 91-100.
Riols, C. (1978). Précisions sur le passage de l'Hirondelle rousseline *Hirundo daurica* en Tunisie. *Alauda* **46(2)**: 183.
Ripley, S.D. (1948). Notes on Indian birds, 1. *J. Bombay Nat. Hist. Soc.* **47(4)**: 622-627.
Ripley, S.D. (1964). *A Systematic and Ecological Study of Birds of New Guinea*. Peabody Museum of Natural History Yale University Bulletin **19**. New Haven, Connecticut. 85 pp.
Ripley, S.D. (1982). *A Synopsis of the Birds of India and Pakistan Together with those of Nepal, Bhutan, Bangladesh and Sri Lanka*. Bombay Natural History Society, Bombay.
Ripley, S.D. & Bond, G.M. (1971). Systematic notes on a collection of birds from Kenya. *Smithsonian Contrib. Zool.* **111**: 1-21.
Ritschel-Kandel, G. & Richter, K. (1992). Beobachtungen zum Vorkommen der Heidelerche in Unterfranken und Massnahmen des Naturschutzes zur Verbesserung der Lebensraume. *Abh. Naturwiss. Vereins Würzburg* **33**: 5-22.
Riveros, G. (1989). Análisis de la comunicación sonora de tres especies de golondrinas (*N. cyanoleuca, T. leucorrhoa* y *T. albiventer*. Familia: Hirundinidae). *An. Mus. Hist. Nat. Valparaiso* **20**: 85-98.
Robbins, C.S., Bystrak, D. & Geissler, P.H. (1986). *The Breeding Bird Survey: its First 15 Years 1965-1979*. USDA Fish & Wildlife Service, Washington, D.C.
Robbins, C.S., Fitzpatrick, J.W. & Hamel, P. (1992). A warbler in trouble: *Dendroica cerulea*. Pp. 549–562 in: Hagan & Johnston (1992).
Robbins, M.B. (1983). The display repertoire of the Band-tailed Manakin (*Pipra fasciicauda*). *Wilson Bull.* **95(3)**: 321-342.
Robbins, M.B. (1985). Social organization of the Band-tailed Manakin (*Pipra fasciicauda*). *Condor* **87(4)**: 449-456.
Robbins, M.B. (1998). Display behavior of male Sprague's Pipits. *Wilson Bull.* **110(3)**: 435-438.
Robbins, M.B. & Dale, B.C. (1999). Sprague's Pipit (*Anthus spragueii*). No. **439** in: Poole, A. & Gill, F. eds. (1999). *The Birds of North America*. Vol. 11. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Robbins, M.B. & Ridgely, R.S. (1990). The avifauna of an upper tropical cloud forest in southwestern Ecuador. *Proc. Acad. Nat. Sci. Philadelphia* **142**: 59-72.
Robbins, M.B., Faucett, R.C. & Rice, N.H. (1999). Avifauna of a Paraguayan cerrado locality: Parque Nacional Serranía San Luis, Depto. Concepción. *Wilson Bull.* **111(2)**: 216-228.
Robbins, M.B., Parker, T.A. & Allen, S.E. (1985). The avifauna of Cerro Pirre, Darién, eastern Panama. Pp. 198-232 in: Buckley *et al.* (1985).
Robbins, M.B., Ridgely, R.S., Schulenberg, T.S. & Gill, F.B. (1987). The avifauna of the cordillera de Cutucu, Ecuador, with comparisons to other Andean localities. *Proc. Acad. Nat. Sci. Philadelphia* **139(1)**: 243-260.
Robbins, M.B., Rosenberg, G.H., Molina, F.S. & Jácome, M.A. (1997). Taxonomy and nest description of the Tumbes Swallow (*Tachycineta [albilinea] stolzmanni*). Pp. 609-612 in: Remsen (1997).
Robbins, M.B., Rosenberg, G.H. & Sornoza, F. (1994). A new species of cotinga (Cotingidae: *Doliornis*) from the Ecuadorian Andes, with comments on plumage sequences in *Doliornis* and *Ampelion*. *Auk* **111(1)**: 1-7.
Robbins, S.D. (1991). *Wisconsin Birdlife*. University of Wisconsin Press, Madison, Wisconsin.
Roberson, D. (1980). *Rare Birds of the West Coast of North America*. Woodcock, Pacific Grove, California.
Roberson, D. (1993). Cassin's Kingbird (*Tyrannus vociferans*). Pp. 218-219 in: Roberson, D. & Tenney, C. eds. (1993). *Atlas of the Breeding Birds of Monterey County, California*. Monterey Peninsula Audubon Soc., Pacific Grove, California.
Roberson, D. (1996). A range extension of Ochre-faced Tody-flycatcher *Todirostrum plumbeiceps* in Peru. *Cotinga* **6**: 30-31.
Roberts, A. (1913). Egg-collecting in the bushveld. *J. South Afr. Orn. Union* **9(1)**: 1-45.
Roberts, A. (1922). Review of the nomenclature of South African birds. *Ann. Transvaal Mus.* **8**: 187-272.
Roberts, A. (1939). Swifts and other birds nesting in buildings. *Ostrich* **10**: 85-99.
Roberts, G.J. (1979). *The Birds of South-East Queensland*. Queensland Conservation Council, Brisbane, Australia.
Roberts, S. (1922). Prince Edward's Lyrebird at home. *Emu* **21**: 242-252.
Roberts, T.J. (1992). *The Birds of Pakistan*. Vol. 2. Passeriformes. Oxford University Press, Karachi.
Roberts, T.J. (2002). Additions to the checklist of the birds of Pakistan, Vol. 1 non-passeriformes, Vol. 2 passeriformes. *J. Bombay Nat. Hist. Soc.* **99(2)**: 323-325.
Roberts, W.W. (1925). The Stripe-bellied Pipit in Eastern Cape Colony. *Blythswood Review* **2**: 38.
Robertson, C.J.R. (1985). *Reader's Digest Complete Book of New Zealand Birds*. Reader's Digest, Sydney.
Robertson, H. & Heather, B. (2001). *The Hand Guide to the Birds of New Zealand*. Oxford University Press, Oxford.
Robertson, I.S. (1986). Identification of White-winged Lark. *British Birds* **79(7)**: 332-335.
Robertson, I.S. (1995). First field observations on the Sidamo Lark *Heteromirafra sidamoensis*. *Bull. Brit. Orn. Club* **115(4)**: 241-243.
Robertson, P. (1989). Melodious Lark duetting. *Witwatersrand Bird Club News* **147**: 15.
Robertson, P. (1991). Some observations on the Shortclawed Lark. *Witwatersrand Bird Club News* **152**: 10-11.
Robertson, R.J. (1990). Tactics and counter-tactics of sexually selected infanticide in Tree Swallows. Pp. 381-390 in: Blondel, J., Gosler, A., Lebreton, J.D. & McCleery, R. eds. (1990). *Population Biology of Passerine Birds. an Integrated Approach*. Springer Verlag, Berlin.
Robertson, R.J. & Gibbs, H.L. (1982). Superterritoriality in Tree Swallows: a reexamination. *Condor* **84(3)**: 313-316.
Robertson, R.J. & Rendell, W.B. (1990). A comparison of the breeding ecology of a secondary cavity nesting bird, the Tree Swallow (*Tachycineta bicolor*) breeding in nest-boxes and natural cavities. *Can. J. Zool.* **68**: 1046-1052.
Robertson, R.J. & Stutchbury, B.J. (1988). Experimental evidence for sexually selected infanticide in Tree Swallows. *Anim. Behav.* **36**: 749-753.
Robertson, R.J., Gibbs, H.L. & Stutchbury, B.J. (1986). Spitefulness, altruism, and the cost of aggression: evidence against superterritoriality in Tree Swallows. *Condor* **88(1)**: 123-124.
Robertson, R.J., Stutchbury, B.J. & Cohen, R.R. (1992). Tree Swallow (*Tachycineta bicolor*). No. **11** in: Poole, A.F., Stettenheim, P. & Gill, F.B. eds. (1992). *The Birds of North America*. Vol. 1. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Robertson, W.B. & Biggs, C.W. (1983). A West Indian *Myiarchus* in Biscayne National Park. *Amer. Birds* **37**: 802-804.
Robertson, W.B. & Kushlan, J.A. (1974). The southern Florida avifauna. Pp. 414-452 in: Gleason, P.J. ed. (1974). *Environments of South Florida: Present and Past*. Miami Geological Society Memoir **2**, Miami, Florida.

Robertson, W.B. & Woolfenden, G.E. (1992). *Florida Bird Species*. Special Publication **6**, Florida Ornithological Society, Gainesville, Florida.

Robidoux, Y.P. & Cyr, A. (1989). Sélection granulométrique pour la construction du nid chez l'Hirondelle à front blanc, *Hirundo pyrrhonota*. *Can. Field-Nat.* **103(4)**: 577-583. In French with English summary.

Robin, L. (2001). Living with lyrebirds. *Wingspan* **11(2)**: 18-23.

Robinson, F.N. (1972). Some recent developments in a study of the Noisy Scrub-bird (*Atrichornis clamosus*). Pp. 683-684 in: Voous (1972). (Abstract).

Robinson, F.N. (1975). Vocal mimicry and the evolution of bird song. *Emu* **75**: 23-27.

Robinson, F.N. (1977). Environmental origins of the Menuraе. *Emu* **77(4)**: 167-168.

Robinson, F.N. (1991). Phatic communication in bird song. *Emu* **91(1)**: 61-63.

Robinson, F.N. & Curtis, H.S. (1996). The vocal display of the lyrebirds (Menuridae). *Emu* **96(4)**: 258-275.

Robinson, F.N. & Frith, H.J. (1981). The Superb Lyrebird *Menura novaehollandiae* at Tidbinbilla. *Emu* **81(3)**: 145-147.

Robinson, H.C. (1927). *The Birds of the Malay Peninsula. A General Account of the Birds Inhabiting the Region from the Isthmus of Kra to Singapore with the Adjacent Islands*. Vol. 1. The Commoner Birds. Witherby, London.

Robinson, J.C. (1990). *An Annotated Checklist of the Birds of Tennessee*. University of Tennessee Press, Knoxville, Tennessee.

Robinson, R.A. (2001). Feeding ecology of Skylarks *Alauda arvensis* in winter – a possible mechanism for population decline? Pp. 129-138 in: Donald & Vickery (2001).

Robinson, S.K. (1985). The Yellow-rumped Cacique and its associated nest pirates. Pp. 898-907 in: Buckley *et al.* (1985).

Robinson, S.K. (1997). Birds of a Peruvian oxbow lake: populations, resources, predation, and social behavior. Pp. 613-639 in: Remsen (1997).

Robinson, S.K. & Terborgh, J. (1995). Interspecific aggression and habitat selection by Amazonian birds. *J. Anim. Ecol.* **64(1)**: 1-11.

Robinson, S.K. & Terborgh, J. (1997). Bird community dynamics along primary successional gradients of an Amazonian whitewater river. Pp. 641-672 in: Remsen (1997).

Robinson, S.K., Fitzpatrick, J.W. & Terborgh, J. (1995). Distribution and habitat use of Neotropical migrant landbirds in the Amazon basin and Andes. *Bird Conserv. Int.* **5**: 305–323.

Robinson, S.K., Rothstein, S.I., Brittingham, M.C., Petit, L.J. & Grzybowski, J.A. (1995). Ecology and behavior of cowbirds and their impact on host populations. Pp. 428-460 in: Martin & Finch (1995).

Robinson, S.K., Terborgh, J. & Fitzpatrick, J.W. (1988). Habitat selection and relative abundance of migrants in southeastern Peru. Pp. 2298-2307 in: Ouellet (1988).

Robinson, S.K., Thompson, F.R., Donovan, T.M., Whitehead, D.R. & Faaborg, J. (1995). Regional forest fragmentation and the nesting success of migratory birds. *Science* **267**: 1987–1990.

Robson, C.R. (1997). From the field. *Bull. Oriental Bird Club* **25**: 61-69.

Robson, C.R. (2000). *A Field Guide to the Birds of South-east Asia*. New Holland, London.

Rocamora, G. & Yeatman-Berthelot, D. (1999). *Oiseaux Menacés et à Surveiller en France. Listes Rouges et Recherche de Priorités. Populations. Tendances. Menaces. Conservation*. Société d'Études Ornithologiques de France & Ligue pour la Protection des Oiseaux, Paris.

Rocha, G. (2000). Primeros registros de Viudita Oscura (*Elaenia obscura*) para Uruguay. *Achara* **3(3)**: 9.

Rocha, O. & Peñaranda, E. (1995). Avifauna de Huaraco: una localidad de la puna semiárida del altiplano central, Departamento de La Paz, Bolivia. *Cotinga* **3**: 17-25. In Spanish with English summary.

Rocha, O. & Quiroga, C. (1996). *Aves de la Reserva Nacional de Fauna Andina Eduardo Avaroa. Guía de Campo Ilustrada*. Museo Nacional de Historia Natural, La Paz, Bolivia.

Rocha, O. & Quiroga, C. (1998). Composición de la dieta alimenticia de las aves de tres localidades del altiplano boliviano. Pp. 53-55 in: Sagot & Guerrero (1998).

Roda, S.A. & Carlos, C.J. (2003). New records for some poorly-known birds of the Atlantic forest in north-east Brazil. *Cotinga* **20**: 17-20.

Roda, S.A., Carlos, C.J. & Rodrigues, R.C. (2003). New and noteworthy records for some endemic and threatened birds of the Atlantic forest of north-eastern Brazil. *Bull. Brit. Orn. Club* **123(4)**: 227-236.

Rodewald, A.D. & Rodewald, P.G. (2003). Mixed-species bird flocks in primary and regenerating montane forests in Ecuador. *Cotinga* **19**: 51-54.

Rodner, C., Lentino, M. & Restall, R. (2000). *Checklist of the Birds of Northern South America. An Annotated Checklist of the Species and Subspecies of Ecuador, Colombia, Venezuela, Aruba, Curaçao, Bonaire, Trinidad & Tobago, Guyana, Suriname and French Guiana*. Pica Press, Nr. Robertsbridge, UK.

Rodrigues, A.A.F., Lopes, A.T.L., da Cunha, A.H.F. & Pereyra, D.F. (1997). Novas informaçoes sobre migraçoes de *Progne chalybea* no Brasil. Page 133 in: Marini (1997). (Abstract).

Rodrigues, E.B. & Santos, M.P.D. (2000). Levantamento da ornitofauna do Parque Ambiental de Teresina, Piauí. Pp. 230-231 in: Straube *et al.* (2000). (Abstract).

Rodwell, S.P. (1996). Notes on the distribution and abundance of birds observed in Guinea-Bissau, 21 February to 3 April 1992. *Malimbus* **18(1)**: 25-43.

Rodwell, S.P., Sauvage, A., Rumsey, S.J.R. & Bräunlich, A. (1996). An annotated check-list of birds occurring at the Parc National des Oiseaux du Djoudj in Senegal, 1984-1994. *Malimbus* **18(2)**: 74-111.

Roe, N.A. & Rees, W.E. (1979). Notes on the Puna avifauna of Azángaro Province, department of Puna, southern Peru. *Auk* **96(3)**: 475-482.

Rogacheva, H.V. (1992). *The Birds of Central Siberia*. Husum-Druck und Verlagsgesellschaft, Husum, Germany.

Rogers, C.A., Robertson, R.J. & Stutchbury, B.J. (1991). Patterns and effects of parasitism by *Protocalliphora sialia* on Tree Swallow (*Tachycineta bicolor*) nestlings. Pp. 123-139 in: Loye & Zuk (1991).

Rogers, M.J. (1981). Call of Red-throated Pipit. *British Birds* **74**: 228-229.

Rohwer, S. & Niles, D.M. (1977). A historical analysis of spring arrival times in Purple Martins: a test of two hypotheses. *Bird-Banding* **48(2)**: 162-167.

Rohwer, S. & Niles, D.M. (1979). The subadult plumage of male Purple Martins: variability, female mimicry and recent evolution. *Z. Tierpsychol.* **51(3)**: 282-300.

Rojas, R., Piragua, W. & Stiles, F.G. (1997). Primeros registros para Colombia de cuatro taxones de la familia Tyrannidae (Aves: Passeriformes). *Caldasia* **19(3)**: 523-525.

Romero-Zambrano, H. & Rodríguez, V. (1980). *Oncostoma cinereigulare*: new record (Aves, Tyrannidae) in Colombia. *Lozania* **31**: 5-6.

Rompré, G., Aubry, Y. & Kirkconnell, A. (2000). Recent observations of threatened birds in eastern Cuba. *Cotinga* **13**: 66.

Rooneem, T.M. & Robertson, R.J. (1997). The potential to lay replacement clutches by Tree Swallows. *Condor* **99(2)**: 228-231.

Roos, G. (1984). [The migration of Tawny Pipit *Anthus campestris* of Falsterbo during twenty-two autumns: timetables, behaviour and numerical changes]. *Anser* **23(3)**: 149-162. In Swedish with English summary.

Roos, L. & Roos, M. (1989). Contribution to the diet of Greater Striped Swallows. *Birding in SA* **41**: 88.

Root, T. (1988). *Atlas of Wintering North American Birds. An Analysis of Christmas Bird Count Data*. University of Chicago Press, Chicago & London.

do Rosário, L.A. (1996). *As Aves em Santa Catarina: Distribuiçao Geográfica e Meio Ambiente*. Glorianópolis, Santa Catarina, Brazil.

Rose, A.B. (1973). Food of some Australian birds. *Emu* **73**: 177-183.

Rose, A.B. (1974). Birds that include ants in their diet. *Austr. Birds* **9(2)**: 26-30.

Rose, A.B. (1999). Notes on the diet of the Superb Lyrebird *Menura novaehollandiae* in central-eastern New South Wales. *Austr. Bird Watcher* **18(1)**: 35-37.

Rose, A.B. (2001). Tarsus length as a sex determinant in the Superb Lyrebird *Menura novaehollandiae*. *Corella* **25(1)**: 18-20.

Rose, L.N. (1982). Breeding ecology of British pipits and their cuckoo parasite. *Bird Study* **29**: 27-40.

Roselaar, C.S. (1995). *Songbirds of Turkey. An Atlas of Biodiversity of Turkish Passerine Birds*. Pica Press, Nr. Robertsbridge, UK.

Rosenberg, G.H. (1990). Habitat specialization and foraging behavior by birds of Amazonian river islands in northeastern Peru. *Condor* **92(2)**: 427-443.

Rosenberg, G.H. & Stejskal, D. (1999). Annotated checklist and seasonal bar graphs. In: Anon. (1999). *Davis and Russell's Finding Birds in Southeast Arizona*. Tucson Audubon Society, Tucson, Arizona.

Rosenberg, K.V., Ohmar, R.D., & Anderson, B.W. (1982). Community organization of riparian breeding birds' response to an annual resource peak. *Auk* **99**: 260-274.

Rosenberg, K.V., Ohmar, R.D., Hunter, W.C. & Anderson, B.W. (1991). *Birds of the Lower Colorado River Valley*. University of Arizona Press, Tucson, Arizona.

Rosier, A. (1996). The first Wire-tailed Swallow *Hirundo smithii* in Egypt and the Western Palearctic. *Sandgrouse* **18(2)**: 63-64.

Ross, M. (1962). Flocking of Welcome Swallows near Kaikohe. *Notornis* **10(2)**: 90-91.

Ross, M. & Shanks, C.E. (1960). More notes on the nesting of Welcome Swallows in Northland. *Notornis* **9(3)**: 104-105.

Rosselli, L. (1989). *El Ciclo Anual de un Ave Frugívora Migratoria Altitudinal*, Corapipo leucorrhoa *(Pipridae) y los Frutos que Consume*. MSc thesis, Universidad de Costa Rica, San José.

Rosselli, L. (1994). The annual cycle of the White-ruffed Manakin *Corapipo leucorrhoa*, a tropical frugivorous altitudinal migrant, and its food plants. *Bird Conserv. Int.* **4**: 143-160.

Rosselli, L., Vasquez, P. & Ayub, I. (2002). The courtship displays and social system of the White-ruffed Manakin in Costa Rica. *Wilson Bull.* **114(2)**: 165-178.

van Rossem, A.J. (1930). The Sonora races of *Camptostoma* and *Platypsaris*. *Proc. Biol. Soc. Washington* **43**: 129-131.

van Rossem, A.J. (1936). Description of a race of *Myiarchus cinerascens* from El Salvador. *Trans. San Diego. Soc. Nat. Hist.* **8**: 115-118.

van Rossem, A.J. (1940). Notes on some North American birds of the genera *Myiodynastes*, *Pitangus*, and *Myiochanes*. *Trans. San Diego Soc. Nat. Hist.* **9**: 79-86.

Rossouw, J. (1987). Birding before breakfast. *Albatross* **291**: 16.

Rotenberry, J.T. & Wiens, J.A. (1976). Temporal variation in habitat structure and shrubsteppe bird dynamics. *Oecologia* **47**: 1-9.

Roth, P., Oren, D.C. & Novaes, F.C. (1984). The White Bellbird (*Procnias alba*) in the Serra dos Carajas, southeastern Pará, Brazil. *Condor* **86(3)**: 343-344.

Rothschild, W. & Hartert, E. (1899). *A Review of the Ornithology of the Galapagos Islands*. Novitates Zoologicae **6**. 110 pp.

Rothstein, S.I. (1992). Brood parasitism, the importance of experiments and host defences of avifaunas on different continents. Pp. 475-480 in: Bennun (1992).

Round, P.D. (1983). Five bird species new for Thailand. *Bull. Brit. Orn. Club* **103(3)**: 77-79.

Round, P.D. (1988). *Resident Forest Birds in Thailand: their Status and Conservation*. ICBP Monograph **2**, Cambridge.

Round, P.D. (2003). Notes on *Mirafra javanica* in Thailand. MS.

Round, P.D. & Walsh, T.A. (1981). The field identification and status of Dunn's Lark. *Sandgrouse* **3**: 78-83.

Rousset, P. (1998). Deuxième mention de l'Alouette haussecol *Eremophila alpestris* en Camargue. [Second record of Shore Lark in the Camargue]. *Ornithos* **5(2)**: 89-91.

Rowan, M.K. (1963). Range of the Cliff Swallow. *Ostrich* **34**: 181-182.

Rowan, M.K. (1968). The origins of European Swallows wintering in South Africa. *Ostrich* **39**: 76-84.

Rowan, M.K. (1972). Winter quarters of swallows. *Bird Study* **19**: 54-56.

Rowan, M.K. (1983). *The Doves, Parrots, Louries and Cuckoos of Southern Africa*. David Philip, Cape Town.

Rowe, D.L., Murphy, M.T., Fleischer, R.C. & Wolf, P.G. (2001). High frequency of extra-pair paternity in Eastern Kingbirds. *Condor* **103(4)**: 845-851.

Rowe, D.L., Murphy, M.T. & Roper, J.J. (1998). Egg physiognomy and conspecific brood parasitism recognition in the Eastern Kingbird. Page 219 in: Anon. (1998b). (Abstract).

Rowlands, A. (2004). Photospot: Black Lark. *Sandgrouse* **26(1)**: 27-28.

Rowley, I. & Russell, E. (1991). Demography of passerines in the temperate southern hemisphere. Pp. 22-44 in: Perrins, C.M., Lebreton, J.D. & Hirons, G.J.M. eds. (1991). *Bird Population Studies. Relevance to Conservation and Management*. Oxford University Press, Oxford.

Rowley, J.S. (1962). Nesting of the birds of Morelos, Mexico. *Condor* **64(4)**: 253-272.

Rowley, J.S. (1966). *Breeding Records of Birds of the Sierra Madre del Sur, Oaxaca, Mexico*. Proceedings of the Western Foundation of Vertebrate Zoology **1(3)**. 97 pp.

Rowley, J.S. (1984). *Breeding Records of Land Birds in Oaxaca, Mexico*. Proceedings of the Western Foundation of Vertebrate Zoology **2(3)**. 147 pp.

Rowse, P.A.S. (1996). *Birds Seen in Swaziland and Neighbouring Areas of Zululand*. Published privately, Berkshire, UK.

Roy, M.S., Torres-Maura, J.C. & Hertel, F. (1999). Molecular phylogeny and evolutionary history of the tit-tyrants (Aves: Tyrannidae). *Mol. Phylogen. Evol.* **11(1)**: 67-76.

Rozendaal, F.G. & Kortekaas, C.M. (1980). Observation of Mongolian Lark at Schiphol: addition of problem of "escapes". *Dutch Birding* **2(2)**: 69-70.

Rozzi, R., Armesto, J.J., Correa, A., Torres-Mura, J.C. & Sallaberry, M. (1996). Avifauna of primary temperate forests of uninhabited islands of Chiloe Archipelago, Chile. *Rev. Chilena Hist. Nat.* **69(1)**: 125-139.

Ruck, T. (1969). Prolonged aggression of Pied Wagtail towards Ringed Plover. *British Birds* **62**: 202-203.

Rudebeck, G. (1955). Aves I: on an old collection of birds from south west African and adjacent areas. *S. Afr. Anim. Life* **2**: 426-576.

Rufino, R. ed. (1989). *Atlas das Aves que Nidificam em Portugal Continental*. CEMPA, Lisboa.

Rufray, X., Huin, D. & Duquet, M. (2002). Où niche l'Hirondelle rousseline *Hirundo daurica* en France? *Ornithos* **9(2)**: 49-50.

Russell, H.N. & Woodbury, A.M. (1941). Nesting of the Gray Flycatcher. *Auk* **58**: 28–37.

Russell, K.R. & Gauthreaux, S.A. (1999). Spatial and temporal dynamics of a Purple Martin pre-migratory roost. *Wilson Bull.* **111(3)**: 354-362.

Russell, S.M. (1964). *A Distributional Study of the Birds of British Honduras*. Ornithological Monographs **1**. American Ornithologists' Union, Washington, D.C. 196 pp.

Russell, S.M. & Lamm, D.W. (1978). Notes on the distribution of birds in Sonora, Mexico. *Wilson Bull.* **90**: 121-131.

Russell, S.M. & Monson, G. (1998). *The Birds of Sonora*. University of Arizona Press, Tucson, Arizona.

Rust, R.W. (2003). Horned Lark (*Eremophila alpestris* L.) predation on alkali bees, *Nomia melanderi* Cockerell. *West. North Amer. Nat.* **63(2)**: 224-228.

Rustad, O.A. (1972). Tree Swallow nesting study on a bluebird trail in south central Minnesota. *Loon* **44**: 100-105.

Rutgers, A. & Norris, K.A. eds. (1977). *Encyclopaedia of Aviculture*. Vol. 3. Blandford Press, London.

Ryabitsev, V.K. & Tyulkin, Y.A. (1985). Two broods of the Shore-lark (*Eremophila alpestris flava*) in a season in subarctic. *Ornitologiya* **20**: 193-194.

Ryabov, V.F. (1967). [Feeding biology of the Black Lark (*Melanocorypha yeltoniensis* Forst) in the North-Kazakhstan steppes]. *Nauchn. Dokl. Vyssh. Shk. Biol. Nauki* **2**: 18-22. In Russian.

Ryabov, V.F. & Mosalova, N.I. (1967). [The feeding of the White-winged Lark (*Melanocorypha leucoptera* Pall.) before and after agricultural transformation of the North-Kazakhstan steppes]. *Vest. Mosk. Gos. Univ.* **1**: 12–18. In Russian.

Ryall, C. (1991). Avifauna of Nguuni near Mombasa, Kenya, between September 1984 and October 1987. Part 1 – Afrotropical species. *Scopus* **15**: 1-23.

Ryan, B. (1996). Blue swallows in danger. *Africa. Birds & Birding* **1(4)**: 12.

Ryan, B. (1997). Gold mines hard to swallow. South Africa plan to resume mining threatens bird colony. *BBC Wildlife* **15(2)**: 59.

Ryan, P.G. (1996). Barlow's Lark. A new endemic for southern Africa. *Africa. Birds & Birding* **1(4)**: 65-70.

Ryan, P.G. & Bloomer, P. (1997). Geographic variation in Red Lark *Certhilauda burra* plumage, morphology, song and mitochondrial DNA haplotypes. *Ostrich* **68(1)**: 31-36.

Ryan, P.G. & Bloomer, P. (1999). The Long-billed Lark complex: a species mosaic in southwestern Africa. *Auk* **116(1)**: 194-208.

Ryan, P.G. & Marshall, H.K. (1998). The clapping arms-race: why do some Clapper Larks not bother to play the game? Proceedings of the XXII International Ornithological Congress, Durban 1998. *Ostrich* **69(3&4)**: 266. (Abstract).

Ryan, P.G., Bento, C., Cohen, C., Graham, J., Parker, V. & Spottiswoode, C. (1999). The avifauna and conservation status of the Namuli Massif, northern Mozambique. *Bird Conserv. Int.* **9**: 315-331.

Ryan, P.G., Hood, L., Bloomer, P., Komen, J. & Crowe, T.M. (1998). Barlow's Lark: a new species in the Karoo Lark *Certhilauda albescens* complex of southwest Africa. *Ibis* **140(4)**: 605-619.

Ryan, R. (2000). Neotropical Notebook. Scaled Fruiteater *Ampelioides tschudii* in Venezuela. *Cotinga* **13**: 67.

Ryan, T.P. & Collins, C.T. (1999). Growth of a Neotropical tyrannid: the Cinnamon Flycatcher (*Pyrrhomyias cinnamomea*). *Orn. Neotropical* **10(2)**: 233-237.

Ryan, T.P. & Lentino, R.M. (1995). An additional record of the Pale-footed Swallow *Notiochelidon flavipes* from Venezuela. *Bull. Brit. Orn. Club* **115(1)**: 28-29.

Rydzewski, W. (1978). The longevity of ringed birds. *Ring* **96-97**: 218-262.

Ryser, F.A. (1985). *Birds of the Great Basin: a Natural History*. University of Nevada Press, Reno, Nevada.

Ryves, B.H. (1943). An investigation into roles of males in relation to incubation. *British Birds* **37**: 10-16.

Ryves, B.H. (1946). Young birds returning to nest. *British Birds* **39**: 152.

Sackl, P. (1994). Erster Nachweis der Stummellerche (*Calandrella rufescens*) in Österreich. *Egretta* **37(1)**: 37-40.

Sáez-Royuela, R. (1952). Captura en España de *Eremophila alpestris flava* (Gmelin) 1788, anillada en Suecia. *Bol. R. Soc. Esp. Hist. Nat.* **50(1)**: 153-154.

Safford, R.J. (1993). A second record of the Northern White-tailed Bush Lark *Mirafra albicauda* in Ethiopia. *Scopus* **16(2)**: 99-101.

Safriel, U.N. (1990). Winter foraging behaviour of the Dune Lark in the Namib Desert, and the effect of prolonged drought on behaviour and population size. *Ostrich* **61(1-2)**: 77-80.

Sagar Baral, H. (1998). Finn's Weaver *Ploceus megarhynchus* and Singing Bushlark *Mirafra cantillans*: two new species for Nepal. *Forktail* **13**: 129-131.

Sage, B. (1964). Sexual display of the Crested Lark. *British Birds* **57**: 327-328.

Sagot, F. (1998). Nuevas especies en el país en relación a la Lista de las Aves de Bolivia en Armonía de 1995. Pp. 105-112 in: Sagot & Guerrero (1998). (Panel discussion).

Sagot, F. & Guerrero, J. eds. (1998). *Actas del IV Encuentro Boliviano para la Conservación de las Aves. 25 a 27 de Octubre de 1997, Tarija, Bolivia*. Aves y Conservación en Bolivia **1**, Santa Cruz, Bolivia.

Saibene, C.A. (1988). Notas sobre la nidificación del Peutrén (*Colorhamphus parvirostris*) (Tyrannidae). *Garganchillo* **5**: 7-8.

Saibene, C.A. & Castelino, M.A. (1993). *Hemitriccus obsoletus*: una adición a la avifauna argentina. [*Hemitriccus obsoletus*: an addition to the Argentine avifauna]. *Hornero* **13**: 308. In Spanish with English summary.

Saibene, C.A., Castelino, M.A., Rey, N.R., Herrera, J. & Calo, J. (1996). *Inventario de las Aves del Parque Nacional "Iguazú", Misiones, Argentina*. Literature of Latin America, Buenos Aires.

Saino, N. & Møller, A.P. (1994). Secondary sexual characters, parasites and testosterone in the Barn Swallow, *Hirundo rustica*. *Anim. Behav.* **48**: 1325-1333.

Saino, N. & Møller, A.P. (1995a). Testosterone correlates of mate guarding, singing and aggressive behaviour in male Barn Swallows, *Hirundo rustica*. *Anim. Behav.* **49**: 465-472.

Saino, N. & Møller, A.P. (1995b). Testosterone-induced depression of male parental behavior in the Barn Swallow: female compensation and effects of seasonal fitness. *Behav. Ecol. Sociobiol.* **36**: 151-157.

Saino, N. & Møller, A.P. (1996). Sexual ornamentation and immunocompetence in the Barn Swallow. *Behav. Ecol.* **7**: 227-232.

Saino, N., Bolzern, A.M. & Møller, A.P. (1997). Immunocompetence, ornamentation, and viability of male Barn Swallows (*Hirundo rustica*). *Proc. Natl. Acad. Sci. USA* **94**: 549-552.

Saino, N., Calza, S. & Møller, A.P. (1997). Immunocompetence of nestling Barn Swallows in relation to brood size and parental effort. *J. Anim. Ecol.* **66**: 827-836.

Saino, N., Calza, S. & Møller, A.P. (1998). Effects of a dipteran ectoparasite on immune response and growth trade-offs in Barn Swallow, *Hirundo rustica*, nestlings. *Oikos* **81**: 217-228.

Saino, N., Calza, S., Ninni, P. & Møller, A.P. (1999). Barn Swallows trade survival against offspring condition and immunocompetence. *J. Anim. Ecol.* **68**: 999-1009.

Saino, N., Cuervo, J.J., Krivacek, M., de Lope, F. & Møller, A.P. (1997). Experimental manipulation of tail ornament size affects the hematocrit of male Barn Swallows (*Hirundo rustica*). *Oecologia* **110**: 186-190.

Saino, N., Cuervo, J.J., Ninni, P., de Lope, F. & Møller, A.P. (1997). Haematocrit correlates with tail ornament size in three populations of the Barn Swallow (*Hirundo rustica*). *Funct. Ecol.* **11**: 604-610.

Saino, N., Ellegren, H. & Møller, A.P. (1999). No evidence for adjustment of sex allocation in relation to paternal ornamentation and paternity in Barn Swallows. *Mol. Ecol.* **8**: 399-406.

Saino, N., Galeotti, P., Sacchi, R. & Møller, A.P. (1997). Song and sexual immunological condition in male Barn Swallows (*Hirundo rustica*). *Behav. Ecol.* **8**: 364-371.

Saino, N., Incagli, M., Martinelli, R. & Møller, A.P. (2002). Immune response of male Barn Swallows in relation to acute stress, parental effort and sexual ornamentation. *Behav. Ecol.* **13**: 169-174.

Saino, N., Martinelli, R. & Møller, A.P. (2001). Immunoglobulin plasma concentration in relation to egg laying and mate ornamentation of female Barn Swallows (*Hirundo rustica*). *J. Evol. Biol.* **14**: 95-109.

Saino, N., Møller, A.P. & Bolzern, A.M. (1995). Testosterone effects on the immune system and parasite infestations in the Barn Swallow (*Hirundo rustica*): an experimental test of the immunocompetence hypothesis. *Behav. Ecol.* **6**: 397-404.

Saino, N., Ninni, P., Calza, S., Martinelli, R., De Bernardi, F. & Møller, A.P. (2000). Better red than dead: carotenoid-based mouth coloration reveals infection in Barn Swallow nestlings. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **267**: 57-61.

Saino, N., Ninni, P., Incagli, M., Calza, S., Sacchi, R. & Møller, A.P. (2000). Begging and parental care in relation to offspring need and condition in the Barn Swallows (*Hirundo rustica*). *Amer. Naturalist* **156**: 637-649.

Saino, N., Primmer, C.R., Ellegren, H. & Møller, A.P. (1997). An experimental study of paternity and tail ornamentation in the Barn Swallow (*Hirundo rustica*). *Evolution* **51**: 562-570.

Saino, N., Stradi, R., Ninni, P., Pinni, E. & Møller, A.P. (1999). Carotenoid plasma concentration, immune profile, and plumage ornamentation of male Barn Swallows (*Hirundo rustica*). *Amer. Naturalist* **154**: 441-448.

Sakai, H.F. (1987). *Response of Hammond's and Western Flycatchers to Different Aged Douglas-fir Stands in Northwestern California*. MSc thesis, Humboldt State University, Arcata, California.

Sakai, H.F. (1988). Breeding biology and behavior of Hammond's and Western Flycatchers in northwestern California. *Western Birds* **19**: 49–60.

Salaman, P.G.W. ed. (1994). *Surveys and Conservation of Biodiversity in the Chocó, South-west Colombia*. BirdLife Study Report **61**. BirdLife International, Cambridge.

Salaman, P.G.W., Amaya, J.D. & Renjifo, L.M. (2002). *Myiotheretes pernix*. Pp. 342-344 in: Renjifo *et al.* (2002).

Salaman, P.G.W., Donegan, T.M. & Cuervo, A.M. (2002). New distributional bird records from Serranía de San Lucas and adjacent Central Cordillera of Colombia. *Bull. Brit. Orn. Club* **122(4)**: 285-303.

Saldanha, C.J., Colin, J., Schultz, J.D., London, S.E. & Schlinger, B.A. (2000). Telencephalic aromatase but not a song circuit in a sub-oscine passerine, the Golden-collared Manakin (*Manacus vitellinus*). *Brain Behav. Evol.* **56(1)**: 29-37.

Salewski, V. (1997a). Notes on some bird species from Comoe National Park, Ivory Coast. *Malimbus* **19(2)**: 61-67.

Salewski, V. (1997b). The immature plumage of Sun Lark *Galerida modesta*. *Bull. African Bird Club* **4(2)**: 136.

Salewski, V. (1998). Brown-throated Sand Martin *Riparia paludicola*, new for Ivory Coast. *Malimbus* **20(2)**: 127-128.

Salewski, V. (2000). The birds of Comoé National Park, Ivory Coast. *Malimbus* **22(2)**: 55-76.

Salinas, L., Samamé, M., Franke, I. & Fjeldså, J. (2003). Primer registro del Frutero Pechinegro *Pipreola lubomirskii* (Aves, Cotingidae) en la vertiente occidental de los Andes. [First record of Black-chested fruiteater *Pipreola lubomirskii* (Aves, Cotingidae) in the western slopes of the Andes]. *Rev. Peru. Biol.* **10(1)**: 93-97. In Spanish with English summary.

Salmon, L. (1975). Swallow versus bee. *Gosse Bird Club Broadsheet* **24**: 17.

Salmon, L. (1991). Caribbean Martin. *Gosse Bird Club Broadsheet* **56**: 23.

Salter, B.E. (1960). At home with the swallows. *Austr. Bird Watcher* **1**: 63-65.

Salvador, S.A. (1988). Datos de peso de aves argentinas. *Hornero* **13**: 78-83.

Salvan, J. (1968). Contribution à l'étude des oiseaux du Tchad. *Oiseau et RFO* **38**: 127-150.

Salvan, J. (1969). Contribution à l'étude des oiseaux du Tchad. *Oiseau et RFO* **39**: 38-69.

Salvin, O. (1876). On the avifauna of the Galapagos Archipelago. *Trans. Zool. Soc. London* **9**: 447-510.

Salvin, O. (1889). A list of the birds of the islands of the coast of Yucatan and of the Bay of Honduras (contd.). *Ibis* **1889**: 359-379.

Salvin, O. & Godman, F.D. (1892). *Biología Centrali-Americana*. Aves. Volume II. R.H. Porter, London.

Sammalisto, L. (1955). Lapinkirvinen, *Anthus cervinus* (Pall.), Hailuodossa. [The Red-throated Pipit recorded on the island of Hailuoto]. *Ornis Fenn.* **32**: 25.

Samper, C. (1992). Courtship feeding in the Orange-breasted Fruit-eater *Pipreola jucunda*. *Bull. Brit. Orn. Club* **112(2)**: 133-134.

Samprieto, F.J. & Pelayo, E. (2003). Terrera Marismeña *Calandrella rufescens*. Pp. 370-371 in: Martí & del Moral (2003).

Samuel, D.E. (1969a). *The Ecology, Behavior, and Vocalizations of Sympatric Barn and Cliff Swallows in West Virginia*. PhD thesis, West Virginia University, Morgantown, West Virginia.

Samuel, D.E. (1969b). House Sparrow occupancy of Cliff Swallow nests. *Wilson Bull.* **81**: 103-104.

Samuel, D.E. (1969c). Nest abandonment and possible management of the Cliff Swallow in West Virginia. *Trans. NE Fish. Wildl. Conf.* **26**: 181-185.

Samuel, D.E. (1971a). Vocal repertoires of sympatric Barn and Cliff Swallows. *Auk* **88**: 839-855.

Samuel, D.E. (1971b). The breeding biology of Barn and Cliff Swallows in West Virginia. *Wilson Bull.* **83**: 284-301.

Samuel, D.E. (1971c). Field methods for determining the sex of Barn Swallows (*Hirundo rustica*). *Ohio J. Sci.* **71**: 125-128.

Sánchez, A., Yanes, M. & Suárez, F. (1997). Dinámica poblacional y conservación de paseriformes esteparios almerienses. Unpublished report for the Instituto de Estudios Almerienses.

Sánchez, B., Navarro, N., Oviedo, R., Peña, C., Hernández, A., Reyes, E., Blanco, P., Sánchez, R. & Herrera, A. (2003). Composición y abundancia de las aves en tres formaciones vegetales de la altiplanicie de Nipe, Holguín, Cuba. *Orn. Neotropical* **14**: 215-231.

Sánchez, C. (2002). Nest, egg, and nesting biology of the Snowy Cotinga (*Carpodectes nitidus*). *Wilson Bull.* **114(4)**: 517-519.

Sandhu, P.S. & Saini, H.K. (1990). Occurrence of the Blyth's Pipit, *Anthus godlewskii*, (Taczanowski) at Ludhiana, Punjab. *Pavo* **28(1-2)**: 71-72.

Sane, R. & Wassmer, B. (1999). Statut et répartition du Cochevis huppé (*Galerida cristata*) en Alsace. [The Crested Lark (*Galerida cristata*) in Alsace]. *Ciconia* **22(3)**: 99-128.

Sangha, H.S. (1999). Short-toed Lark *Calandrella cinerea* feeding on pearl millet *Pennisetum typhoides* in Rajasthan, India. *J. Bombay Nat. Hist. Soc.* **96(3)**: 474.

Sangster, G. (1998). Newly described bird species. *Dutch Birding* **20**: 55-56.

Sangster, G. (2002). New species of pipit. *Dutch Birding* **24(4)**: 256.

Sangster, G., Hazevoet, C.J., Van den Berg, A.B. & Roselaar, C.S. (1998). Dutch avifaunal list: species concepts, taxonomic instability, and taxonomic changes in 1998. *Dutch Birding* **20(1)**: 22-32.

Sangster, G., Hazevoet, C.J., Van den Berg, A.B., Roselaar, C.S. & Sluys, R. (1999). Dutch avifaunal list: species concepts, taxonomic instability, and taxonomic changes in 1977-1998. *Ardea* **87(1)**: 139-166.

Sangster, G., Knox, A.G., Helbig, A.J. & Parkin, D.T. (2002). Taxonomic recommendations for European birds. *Ibis* **144(1)**: 153-159.

Sansom, O. (1954). Welcome Swallow at Stewart Island. *Notornis* **5(7)**: 205.

Santana, E. & Milligan, B.G. (1984). Behavior of toucanets, bellbirds, and quetzals feeding on Lauraceous fruits. *Biotropica* **16(2)**: 152-154.

Santharam, V. (1980). Some observations on the nests of Yellow-wattled Lapwing, Stone Curlew, Blackbellied Finch-lark and Redwinged Bush-lark. *Newsl. Birdwatchers* **20(6/7)**: 5-12.

Santos, H.F. & Ferreira, M.F.S. (2000). Levantamento preliminar da avifauna dos municípios de Miguel Pereira e Engenheiro Paulo de Frontin, Rio de Janeiro. Pp. 402-403 in: Straube *et al.* (2000). (Abstract).

Sargeant, D.E. (1994). *The Birds of Junglaven, Venezuela*. Published privately, Norfolk, UK.

Sargeant, D.E. & Wall, J. (1996). *Bahia. A Birder's Guide to Bahia, NE Brazil*. Published privately, Norfolk, UK.

Sargent, T.D. (1962). A study of homing in the Bank Swallow (*Riparia riparia*). *Auk* **79**: 234-246.

Sauer, J.R. & Droege, S. (1992). Geographic patterns in population trends of Neotropical migrants in North America. Pp. 26-42 in: Hagan & Johnston (1992).

Sauer, J.R., Hines, J.E., Gough, G., Thomas, I. & Peterjohn, B.G. (1997). *The North American Breeding Bird Survey Results and Analysis*. Version 96.4. Patuxent Wildlife Research Center, Laurel, Maryland.

Saunders, C.M. & Webbon, G.G. (1998). The first Banded Martin *Riparia cincta* in Saudi Arabia. *Sandgrouse* **20(1)**: 55.

Saunders, C.R. (1981). Black Saw-wing Swallow in Swlukwe. *Honeyguide* **106**: 35.

Saunders, D.A. & Ingram, J.A. (1995). *Birds of Southwestern Australia: an Atlas of Changes in the Distribution and Abundance of the Wheatbelt Avifauna*. Surrey Beatty and Sons Ltd, Chipping Norton, Australia.

Saunders, D.A. & de Rebeira, C.P. (1985). *The Birdlife of Rottnest Island*. Published privately, Guildford, Australia.

Saunders, K. (1989). High rise accommodation. *Bokmakierie* **41(2)**: 61.

Saunders, W.E. (1909). The Acadian Flycatcher in Ontario. *Auk* **26**: 430.

Savalli, U.M. (1991). New birds from Kakamega, western Kenya, including new breeding records. *Scopus* **15**: 35-41.

Scarlett, R.J. (1968). Welcome Swallows in the Far North. *Notornis* **15(1)**: 44.

Scebba, S. (2001). Biometrics and sex ratios of Skylarks *Alauda arvensis* during migration in southern Italy. *Ringing & Migration* **20(4)**: 364-370.

Schäfer, E. & Phelps, W.H. (1954). *Las Aves del Parque Nacional Henri Pittier (Rancho Grande) y sus Funciones Ecológicas*. Boletín de la Sociedad Venezolana de Ciencias Naturales **16(83)**. 165 pp.

Schäfer, T. & Vogel, B. (2000). Why do Woodlarks need field-forest ecotones? - An analysis of possible factors. *J. Orn.* **141(3)**: 335-344.

Schaldach, W.J. (1963). *The Avifauna of Colima and Adjacent Jalisco, Mexico*. Proceedings of the Western Foundation of Vertebrate Zoology **1(1)**. 100 pp.

van Scheepen, P. & Meijer, D. (1996). Dupont's Lark outside known Moroccan breeding area. *Dutch Birding* **18(1)**: 12-13.

Schekkerman, H. (1999). Sex bias and seasonal patterns in tape-lured samples of migrating Skylarks *Alauda arvensis*. *Ringing & Migration* **19(4)**: 299-305.

Scheis, C. & Lavoyer, N. (1987). *Balcad Nature Reserve Birds*. Somali Ecological Reserve, Mogadishu.

Schepers, F.J., Keijl, G.O., Meininger, P.L. & Rigoulot, J.B. (1998). *Oiseaux d'Eau dans le Delta du Sine-Saloum et Petit Côte, Sénégal, Janvier 1997*. WIWO Report **63**. Zeist, Netherlands.

Scherner, E.R. (1996). Die Bedeutung sozioökonomischer Verhältnisse für den Artenschutz am Beispiel der Haubenlerche (*Galerida cristata*) in Nordwestdeutschland. [The importance of socio-economic conditions for species conservation exemplified by the Crested Lark (*Galerida cristata*) in northwest Germany]. *Ökol. Vögel* **18(1)**: 1-44. In German with English summary.

Scherrer, B. & Deschaintre, A. (1970a). Évaluation de l'effectif d'une colonie d'Hirondelles de rivage (*Riparia riparia*) par la méthode des captures et recaptures. *Le Jean-le-Blanc* **9**: 36-43.

Scherrer, B. & Deschaintre, A. (1970b). Étude des échanges de colonies dans une population d'Hirondelles de rivage (*Riparia riparia*). *Le Jean-le-Blanc* **9**: 77-84.

Schifferli, L. (1972). Futterungsfrequenz am Nest der Bergestelze *Motacilla cinerea* in verschieden Biotopen und Brutmonaten. [Feeding frequency at the nest of the Grey Wagtail in various biotopes and breeding months]. *Orn. Beob.* **69**: 257-274. In German with English summary.

Schippers, P., Williams, J.B. & Kropff, M.J. (2001). Energy expenditure and water flux of free-living Dune Larks in the Namib: a test of the reallocation hypothesis on a desert bird. *Functional Ecology* **15(2)**: 175-185.

Schläpfer, A. (1988). Populationsökologie der Feldlerche *Alauda arvensis* in der intensiv genutzten Agrarlandschaft. *Orn. Beob.* **85(4)**: 309-371.

Schläpfer, A. (2001). A conceptual model of Skylark *Alauda arvensis* territory distribution in different landscape types. Pp. 3-9 in: Donald & Vickery (2001).

Schlatter, R.P. (1985). Plantcutter. Page 466 in: Campbell & Lack (1985).

Schlinger, B.A., Schultz, J.D. & Hertel, F. (2001). Neuromuscular and endocrine control of an avian courtship behaviour. *Horm. Behav.* **40**: 276-280.

Schlogel, N. (1989). Zum Verhalten der Ohrenlerche. *Falke* **36(5)**: 162-163.

Schmid, C.K. (1993). Birds of Nokopo. *Muruk* **6(2)**: 1-62.

Schmid, H., Burkhardt, M., Keller, V., Knaus, P., Volet, B. & Zbinden, N. (2001). *Die Entwicklung der Vogelwelt in der Schweiz*. Avifauna Report Sempach **1**. Anhang, Germany.

Schmidl, D. (1982). *The Birds of the Serengeti National Park, Tanzania*. British Ornithologists' Union, Tring, UK.

Schmidt, C. (1993). [Differences between Richard's Pipit *Anthus richardi* and Tawny Pipit *A. campestris* in juvenile and first winter plumage]. *Limicola* **7(4)**: 178-190. In German with English summary.

Schmidt, R.K. (1959). Notes on the Pearl-breasted Swallow *Hirundo dimidiata* in the south-western Cape. *Ostrich* **30**: 155-158.

Schmidt, R.K. (1962). Breeding of the Larger Striped Swallow *Cecropis cucullata* in the south west Cape. *Ostrich* **33**: 3-8.

Schmidt, R.K. (1964). Incubation period of Rock Martin (*Ptyonoprogne fuligula* (Lichtenstein)). *Ostrich* **35**: 122.

Schmidt, R.K. (1990). Swallows and swifts in the south-western Cape. *Afr. Wildl.* **44**: 133-137.

Schmidtuz, C., Güller, R., Di Santo, H., Chevez, R., Tahmazian, R. & Quinteros, A. (2001). Nuevos registros para Misiones (Argentina) de la Viudita Coluda (*Muscipipra vetula*) y el Chacurú Grande (*Notharchus macrorhynchus*). *Nuestras Aves* **41**: 4.

Schmitt, C.G., Schmitt, D.C. & Remsen, J.V. (1997). Birds of the Tambo Area, an arid valley in the Bolivian Andes. Pp. 701-716 in: Remsen (1997).

Schmitt, C.G., Schmitt, D.C., Remsen, J.V. & Glick, D.D. (1986). New bird records for Departamento Santa Cruz, Bolivia. *Hornero* **12**: 307-311.

Schmutterer, H. (1969). *Pest Crops of Northeast and Central Africa, with Particular Reference to Sudan*. Gustav Fischer, Stuttgart, Germany. 296 pp.

Schodde, R. (1994). Are ancestral lineages of the Australian land bird avifauna rooted in the Gondwanan *Nothofagus* flora? Page 321 in: Dittami (1994). (Abstract).

Schodde, R. (1996). *Murwillumbah Management Area Fauna Survey 1995*. CSIRO, Canberra.

Schodde, R. & Mason, I.J. (1999). *The Directory of Australian Birds. Passerines*. CSIRO, Canberra.

Schodde, R. & Tidemann, S.C. eds. (1986). *Reader's Digest Complete Book of Australian Birds*. Reader's Digest Services, Sydney.

Schodde, R., Fullagar, P. & Hermes, N. (1983). *A Review of Norfolk Island Birds: Past and Present*. Special Publication **8**. Australian National Parks & Wildlife Service, Canberra.

Schön, M. (1999). Zur Bedeutung von Kleinstrukturen im Ackerland: Bevorzugt die Feldlerche (*Alauda arvensis*) Störstellen mit Kümmerwuchs? [On the significance of micro-structures in arable land: does the Skylark (*Alauda arvensis*) show a preference for places with stunted growth?] *J. Orn.* **140(1)**: 87-91.
Schönwetter, M. (1979). *Handbuch der Oologie*. Vol. 2. Passeriformes I. Akademie-Verlag, Berlin.
Schönwetter, M. & Meise, W. (1968). *Handbuch der Oologie*. Vol. 2, pt. 15. Akademie-Verlag, Berlin..
Schönwetter, M. & Meise, W. (1969). *Handbuch der Oologie*. Vol. 2, pt. 16. Akademie-Verlag, Berlin..
Schönwetter, M. & Meise, W. (1977). *Handbuch der Oologie*. Vol. 2, pt. 26. Akademie-Verlag, Berlin..
Schönwetter, M. & Meise, W. (1988). *Handbuch der Oologie*. Vol. 2, pt. 44. Akademie-Verlag, Berlin..
Schorger, A.W. (1927). Notes on the distribution of some Wisconsin birds. I. *Auk* **44**: 94–112.
Schouteden, H. (1922). Note sur la découverte du nid de *Pseudochelidon eurystomina* Hartl. *Rev. Zool. Afr.* **10**: 323-328.
Schrader, N.W. (1976). Breeding of the Welcome Swallow at Ivanhoe in western New South Wales. *Austr. Birds* **111**: 1-17.
Schroeter, W. (1983). Zu: Bachstelze (*Motacilla alba*) attackiert Großlibelle (*Anisoptera*). [Re: White Wagtail (*Motacilla alba*) attacks Dragonfly (*Anisoptera*)]. *Vogelwelt* **104(6)**: 225.
Schubart, O., Aguirre, A.C. & Sick, H. (1965). *Contribuição para o Conhecimento da Alimentação das Aves Brasileiras*. Arquivos de Zoologia São Paulo **12**. 154 pp.
Schuchmann, K.L. (1981). Zur Avifauna von Guadeloupe, W.I. *Vogelwelt* **102**: 15-27.
Schuchmann, K.L. (1984). Zur Ernährung des Cayenne-Felsenhahnes (*Rupicola rupicola*, Cotingidae). [Some information on (*Rupicola rupicola*, Cotingidae)]. *J. Orn.* **125(2)**: 239-241. In German with English summary.
Schuchmann, K.L. (1985). Beobachtungen am Gelbbauch-Spateltyrannen (*Todirostrum cinereum*) in Suriname. *Trochilus* **6(3)**: 80-83.
Schuchmann, K.L., Corredor, G., Torres, A.M. & Acevedo, C. (1989). Beobachtungen am Andenfelsenhahn (*Rupicola peruviana*). *Trochilus* **10(1)**: 24-29..
Schukman, J.M. (1976). Unusual nesting of Eastern and Say's Phoebes in an area of sympatry. *Kansas Orn. Soc. Bull.* **27**: 43–44.
Schukman, J.M. & Wolf, B.O. (1998). Say's Phoebe (*Sayornis saya*). No. **374** in: Poole, A.F. & Gill, F.B. eds. (1998). *The Birds of North America*. Vol. 10. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Schulenberg, T.S. (2002). Birds. Pp. 141-148 in: Pitman, N., Alverson, W.S. & Moskovits, D.K. eds. (2002). *Ecuador: Serranías Cofán-Bermejo, Sinangoe*. Rapid Biological Inventories Report **3**. Field Museum of Natural History, Chicago, Illinois.
Schulenberg, T.S. & Awbrey, K. (1997). *The Cordillera del Cóndor Region of Ecuador and Peru: a Biological Assessment*. Rapid Assessment Program Working Papers **7**. Conservation International, Washington, D.C.
Schulenberg, T.S. & Graham, L.G. (1981). A new subspecies of *Anairetes agraphia* (Tyrannidae) from northern Peru. *Bull. Brit. Orn. Club* **101**: 241-243.
Schulenberg, T.S. & Parker, T.A. (1981). Status and distribution of some northwest Peruvian birds. *Condor* **83(3)**: 209-216.
Schulenberg, T.S. & Parker, T.A. (1997). A new species of tyrant-flycatcher (Tyrannidae: *Tolmomyias*) from the western Amazon basin. Pp. 723-731 in: Remsen (1997).
Schulenberg, T.S. & Remsen, J.V. (1982). Eleven bird species new to Bolivia. *Bull. Brit. Orn. Club* **102(2)**: 52-57.
Schulenberg, T.S. & Servat, G. (2001). Avifauna of the northern Cordillera de Vilcabamba, Peru. Pp. 92-97 in: Alonso, L.E., Alonso, A., Schulenberg, T.S. & Dallmeier, F. eds. (2001). *Biological and Social Assessments of the Cordillera de Vilcabamba, Peru*. Rapid Assessment Program Working Papers **12**. Conservation International, Washington, D.C.
Schulenberg, T.S. & Wust, W.H. (1997). Birds of the Upper Río Comainas, Cordillera del Cóndor. Pp. 180-187 in: Schulenberg, T.S. & Awbrey, K. eds. (1997). *The Cordillera del Cóndor Region of Ecuador and Peru: a Biological Assessment*. Rapid Assessment Program Working Papers **7**. Conservation International, Washington, D.C.
Schulenberg, T.S., Allen, S.E., Stotz, D.F. & Wiedenfeld, D.A. (1984). Distributional records from the Cordillera Yanachaga, central Peru. *Le Gerfaut* **74**: 57-70.
Schulenberg, T.S., O'Neill, J.P., Lanes, D.F., Valqui, T. & Albújar, C. (2001). Birds. Pp. 146-155, 206-225 in: Alverson, W.S., Rodríguez, L.O. & Moskovits, D.K. eds. (2001). *Perú: Biabo Cordillera Azul*. Rapid Biological Inventories Report **2**. Field Museum of Natural History, Chicago.
Schulenberg, T.S., Quirroga, C. & Jammes, L. (1997). Birds of Cerro Bufete and the Río Santa Martha Basin, south central Chuquisaca, Bolivia. Pp. 72-76 in: Schulenberg, T.S. & Awbrey, K. eds. (1997). *A Rapid Assessment of the Humid Forests of South Central Chuquisaca, Bolivia*. Rapid Assessment Program Working Papers **8**. Conservation International, Washington, D.C.
Schultz, A. (1998). To whom can the correct identification of the Citrine Wagtail be accredited? *Bee-Eater* **49**: 27.
Schultz, J.D., Hertel, F., Bauch, M. & Schlinger, B.A. (2001). Adaptations for rapid and forceful contraction in wing muscles of the male Golden-collared Manakin: sex and species comparisons. *J. Comp. Physiol. A Sens. Neural Behav. Physiol.* **187(9)**: 677-684.
Schulze-Hagen, K. (1970). Ein Beitrag zur Ernährung der Rauchschwalbe (*Hirundo rustica*). *Charadrius* **6**: 81-90.
Schürer, U. & Bock, J. (1995). Die Zucht der Purpurkehlkotinga (*Cotinga cayana*) und des Nacktkehlglockenvogels (*Procnias nudicollis*) im Zoologischen Garten Wuppertal. [Breeding Spangled Cotingas and Bare-throated Bellbirds at Wuppertal Zoo]. *Zool. Garten* **65(6)**: 345-356. In German with English summary..
Schüz, E. (1964). Felsenschwalbe als Hausbrüter in Burgeis (Obervintschgau) und in der Schweiz. *Orn. Beob.* **61**: 61-64.
Schwartz, P. & Snow, D.W. (1979). Display and related behavior of the Wire-tailed Manakin. *Living Bird* **17**: 51-78.
Sciborska, M. (2004). Breeding biology of the Citrine Wagtail (*Motacilla citreola*) in the Gdansk region (N Poland). *J. Orn.* **145(1)**: 41-47.
Sclater, P.L. (1871a). Remarks on the species of the genera *Myiozetetes* and *Conopias*. *Proc. Zool. Soc. London* **1870**: 751-756.
Sclater, P.L. (1871b). Notes on the types of *Tyrannula mexicana* of Kaup, and *Tyrannula barbirostris* of Swainson. *Proc. Zool. Soc. London* **1871**: 84-85.
Sclater, P.L. (1888). *Catalogue of the Birds in the British Museum*. Vol. 14. Trustees of the British Museum, London.
Sclater, P.L. & Hudson, W.H. (1888). *Argentine Ornithology*. Vol. 1. Porter, London.
Sclater, P.L. & Salvin, O. (1879). On the birds collected by the late Mr. T.K. Salmon in the state of Antioquia, United States of Colombia. *Proc. Zool. Soc. London* **1879**: 486-550.
Sclater, W.L. & Moreau, R.E. (1933). Taxonomic and field notes on some birds of northeastern Tanganyika territory. Part IV. *Ibis* **Ser. 13, no. 3**: 187-191.
Scott, A.J. (1986). Breeding data - Wire-tailed Swallow *Hirundo smithii*. *Zambian Orn. Soc. Newsl.* **16(3)**: c-d.
Scott, B. & Pitcher, A. (2002). New wagtail species honours Cambodian conservationist. *British Birds* **95(2)**: 94.
Scott, D.A. (1994). First record of Olive-backed Pipit *Anthus hodgsoni* in Iran. *Sandgrouse* **16(1)**: 59-61.
Scott, D.A. & Brooke, M. de L. (1985). The endangered avifauna of southeastern Brazil: a report on the BOU/WWF expeditions of 1980/81 and 1981/82. Pp. 115-139 in: Diamond & Lovejoy (1985).
Scott, O.K. (1993). *A Birder's Guide to Wyoming*. American Birding Association, Colorado Springs, Colorado.
Scott, V.E. & Crouch, G.L. (1988). *Summer Birds and Mammals of Aspen-conifer Forests in West-central Colorado*. USDA Forest Service General Research Paper **RM-280**.
Scott, V.E. & Patton, D.R. (1989). *Cavity Nesting Birds of Arizona and New Mexico Forests*. USDA Forest Service General Technical Report **RM-10**. Reprinted by Arizona Wildlife Foundation.
Scott, V.E., Crouch, G.L. & Whelan, J.A.. (1982). *Response of Birds and Small Mammals to Clearcutting in a Subalpine Forest in Central Colorado*. USDA Forest Service General Research Note **RM-422**.
Scott, V.E., Evans, K.E., Patton, D.R. & Stone, C.P. (1977). *Cavity-nesting Birds of North American Forests*. Agriculture Handbook **511**. US Department of Agriculture, Forest Service, Fort Collins, Colorado.
Screws, D.G. (1991). Unusual behavior in Northern Rough-winged Swallows. *Oriole* **56**: 44-45.
Sealy, S.G. (1982). Rough-winged Swallow scavenging adult midges. *Wilson Bull.* **94(3)**: 368-369.
Sealy, S.G. & Biermann, G.C. (1983). Timing of breeding and migrations in a population of Least Flycatchers in Manitoba. *J. Field Orn.* **54(2)**: 113-124.
Secker, H.L. (1958). Status of Rifleman in hillside scrub land of Wellington District. *Notornis* **8(1)**: 23.
Secord, A.L., McCarty, J.P., Echols, K.R., Meadows, J.C., Gale, R.W. & Tillitt, D.E. (1999). Polychlorinated biphenyls and 2, 3, 7, 8-tetrachlorodibenzo-p-dioxin equivalents in Tree Swallows from the upper Hudson River, New York State, USA. *Environm. Toxicol. Chem.* **18**: 2519-2525.
Sedgwick, E.H. (1949). Tree Martin (*Hylochelidon nigricans*) nesting on wooden buildings. *West. Austr. Nat.* **1**: 154-155.
Sedgwick, E.H. (1958). Fairy Martins in southwestern Australia. *West. Austr. Nat.* **6**: 100-105.
Sedgwick, J.A. (1975). *A Comparative Study of the Breeding Biology of Hammond's (*Empidonax hammondii*) and Dusky (*Empidonax oberholseri*) Flycatchers*. MSc thesis, University of Montana, Missoula, Montana.
Sedgwick, J.A. (1993a). Dusky Flycatcher (*Empidonax oberholseri*). No. **78** in: Poole, A.F. & Gill, F.B. eds. (1993). *The Birds of North America*. Vol. 2. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Sedgwick, J.A. (1993b). Reproductive ecology of Dusky Flycatchers in western Montana. *Wilson Bull.* **105**: 84-92.
Sedgwick, J.A. (1994). Hammond's Flycatcher (*Empidonax hammondii*). No. **109** in: Poole & Gill (1994).
Sedgwick, J.A. (1998a). Regional variability in the song of the Willow Flycatcher. Page 230 in: Anon. (1998b), (Abstract).
Sedgwick, J.A. (1998b). Gray Flycatcher. Pp. 276–277 in: Kingery, H.E. ed. (1998). *Colorado Breeding Bird Atlas*. Colorado Bird Atlas Partnership & Colorado Division of Wildlife, Denver, Colorado.
Sedgwick, J.A. (2000). Willow Flycatcher (*Empidonax traillii*). No. **533** in: Poole & Gill (2000b).
Sedgwick, J.A. (2001). Geographic variation in the song of Willow Flycatchers: differentiation between *Empidonax traillii adastus* and *E. t. extimus*. *Auk* **118(2)**: 366-379.
Seel, D.C. (1973). Egg-laying by the cuckoo. *British Birds* **66**: 528-535.
Seel, D.C. & Walton, K.C. (1974). Apparent polygyny in the Meadow Pipit. *Bird Study* **21**: 282.
Seel, D.C. & Walton, K.C. (1979). Numbers of Meadow Pipits *Anthus pratensis* on mountain farm grassland in North Wales. *Ibis* **121(2)**: 147-164.
Seibt, U. (1975). Instrumentaldialekte der Klappenlerche *Mirafra rufocinnamomea* (Salvadori). *J. Orn.* **116(1)**: 103-107.
Sekercioglu, C.H., Ehrlich, P.R., Daily, G.C., Aygen, D., Goehring, D. & Sandi, R.F. (2002). Disappearance of insectivorous birds from tropical forest fragments. *Proc. Natl. Acad. Sci. USA* **99(1)**: 263-267.
Selander, R.K. & Baker, J.K. (1957). The Cave Swallow in Texas. *Condor* **59(6)**: 345-363.
Sellin, D. (1993). Massenschlafplatz der Bachstelze im Stadtzentrum von Agadir (SW-Marokko). [Large communal roost of the White Wagtail *Motacilla alba* in SW-Morocco]. *Vogelwelt* **114(5)**: 221-223.
Selvin, E. & Castillo, M.L. (2000). Birds species found in Laguna del Tigre National Park, Petén, Guatemala during the RAP survey. Especies de aves que se encontraron en el Parque Nacional Laguna del Tigre, Petén, Guatemala durante la expedición RAP en 1999. Pp. 208-214 in: Bestelmeyer, B. & Alonso, L.E. eds. (2000). *A Biological Assessment of Laguna del Tigre National Park, Petén, Guatemala. Evaluación Biológica de los Sistemas Acuáticos del Parque Nacional Laguna del Tigre, Petén, Guatemala*. Rapid Assessment Program Bulletin of Biological Assessment **16**. Conservation International, Washigton, D.C. In Spanish and English.
Semmens, A.K. (1993). Observations of swallows and martins using a flyway in western Victoria. *Austr. Bird Watcher* **15(3)**: 108-115.
Sennett, G.B. (1878). Notes on the ornithology of the lower Rio Grande of Texas, from observations made during the season of 1877. *Bull. Geol. Geogr. Surv. Terr.* **4**: 1-66.
Sennett, G.B. (1879). Further notes on the ornithology of the lower Rio Grande of Texas, from observations made during the spring of 1878. *Bull. Geol. Geogr. Surv. Terr.* **5**: 377-440.
Sennett, G.B. (1884). Nest and eggs of Couch's Tyrant Flycatcher (*T. melancholicus couchii*). *Auk* **1(1)**: 93.
Serena, M. (1982). *The Status and Distribution of the Willow Flycatcher in Selected Portions of the Sierra Nevada, 1982*. California Department of Fish & Game Administration Report **82-5**. Sacramento, California.
Serle, W. (1940). Field observations on some northern Nigerian birds. *Ibis* **Ser. 14, no. 4**: 1-47.
Serle, W. (1943). Further field observations on northern Nigerian birds. *Ibis* **85(4)**: 413-437.
Serle, W. (1949). Birds of Sierra Leone III. *Ostrich* **20**: 70-91.
Serle, W. (1950a). Notes on the birds of south-western Nigeria. *Ibis* **92(1)**: 84-94.
Serle, W. (1950b). A contribution to the ornithology of British Cameroons. *Ibis* **92(4)**: 602-638.
Serle, W. (1954). A second contribution to the ornithology of British Cameroons. *Ibis* **96(1)**: 47-80.
Serle, W. (1957). A contribution to the ornithology of the eastern region of Nigeria. *Ibis* **99(3)**: 628-685.
Serle, W. (1965). A third contribution to the ornithology of the British Cameroons. *Ibis* **107(1)**: 60-94.
Serle, W. (1981). The breeding season of birds in the lowland rainforest and in the montane forest of west Cameroon. *Ibis* **123(1)**: 62-74.
Serle, W., Morel, G.J. & Hartwig, W. (1977). *A Field Guide to the Birds of West Africa*. Collins, London.
Sermet, E. (1987). Nourrissages au nid chez l'Alouette lulu. *Lullula arborea*. *Nos Oiseaux* **39(2)**: 75-76.
Serrano, V.H. (1994). *Selección de Hábitat, Ciclo Reproductivo y Sistema Lek de Apareamiento de* Pyroderus scutatus. Bsc thesis, Universidad de Valle, Cali, Colombia.
Servat, G.P. (1993). First records of the Yellow Tyrannulet (*Capsiempis flaveola*) in Peru. *Wilson Bull.* **105(3)**: 534.
Servat, G.P. & Pearson, D.L. (1991). Natural history notes and records for seven poorly-known bird species from Amazonian Peru. *Bull. Brit. Orn. Club* **111(2)**: 92-95.
Serventy, D.L. (1958). Bird notes from the Dumbleyung Camp-out. *Emu* **58**: 5-20.
Serventy, D.L. (1962). Die Wiederentdeckung von *Atrichornis clamosus* (Gould) in Westaustralien. *J. Orn.* **103**: 213-214.
Serventy, D.L. (1970). Torpidity in the White-backed Swallow. *Emu* **70**: 27-28.
Serventy, D.L. (1972). Causal ornithogeography of Australia. Pp. 574-584 in: Voous (1972).
Serventy, D.L. & Whittell, H.M. (1962). *Birds of Western Australia*. 3rd edition. Paterson, Perth, Australia.
Serventy, V. (1975). The Noisy Scrubbird calls again. Pp. 250-251 in: Anon. (1975). *Our Magnificent Wildlife: How to Enjoy and Preserve It*. Reader's Digest, London.
Sessions, P.H.B. (1966). Notes on the birds of Lengetia Farm, Mau Narok. *J. East Afr. Nat. Hist. Soc.* **26**: 18-48.
Seutin, G. (1998). Two bird species new for Panama and Central America: White-whiskered Hermit *Phaetornis yaruqui* and White-winged Swallow *Tachycineta albiventer*. *Cotinga* **9**: 22-23.
Seutin, G. & Apanius, V. (1995). Gray Flycatcher predation on a hummingbird. *Wilson Bull.* **107(3)**: 565-567.
Shalaway, S. (1998). Phoebe fidelity. *Birder's World* **12(2)**: 44-47.
Shannon, G.R. (1974). Studies of less familiar birds. 174. Shore Lark and Temminck's Horned Lark. *British Birds* **67**: 502-511.
Sharland, M.S. (1943). Nesting habits of the Tree Martin. *Emu* **43**: 75.
Sharland, M.S. (1944). The lyrebird in Tasmania. *Emu* **44**: 64-71.
Sharland, M.S. (1952). The lyrebird in Tasmania. *Victorian Naturalist* **69**: 58-59.
Sharma, A.K. (1994). Nesting of Bengal Bush Lark in eastern Rajasthan. *Newsl. Birdwatchers* **34**: 11–12.
Sharman, M.Y., Robertson, R.J. & Ratcliffe, L.M. (1994). Vocalizations of the Tree Swallow (*Tachycineta bicolor*) during the prelaying period: a structural and contextual analysis. *Amer. Midl. Nat.* **132**: 264-274.
Sharp, B. (1986). Guidelines for the management of the Purple Martin, Pacific coast population. *Sialia* **8(1)**: 9-13.
Sharpe, C.J., Ascanio, D. & Rodríguez, G.A. (2001). Further range extensions and noteworthy records for Venezuelan birds. *Bull. Brit. Orn. Club* **121(1)**: 50-62.
Sharpe, R.B. & Wyatt, C.W. (1885-1894). *A Monograph of the Hirundinidae or Family of Swallows*. Sotheran, London.
Sharrock, J.T.R. (1976). *The Atlas of Breeding Birds in Britain and Ireland*. Poyser, Berkhamsted, UK.
Sharrock, J.T.R. (1980). Calls of Olive-backed, Tree and Red-throated Pipits. *British Birds* **73**: 233.
Sharrock, J.T.R., Harris, A. & Mullarney, K. (1989). Desert Lark using Song Thrush-like technique to break hard food item. *British Birds* **82(1)**: 29-30.
Shaw, G.G. (1984). Organochlorine pesticide and PCB residues in eggs and nestlings of Tree Swallows, *Tachycineta bicolor*, in central Alberta. *Can. Field-Nat.* **98**: 258-260.
Shaw, J.R. (1978). Wing flicking by the Dusky Lark. *Honeyguide* **95**: 34.
Shaw, J.R. (1979). Some notes on the fledging of Wiretailed Swallow. *Honeyguide* **98**: 35-37.
Sheldon, F.H. (1998). A phylogeny of the swallows. Una filogenia de las golondrinas. Pp. 71-74 in: Latta, S.C. ed. (1998). *Recent Ornithological Research in the Dominican Republic. Investigaciones Ornitológicas Recientes en la República Dominicana*. Ediciones Tinglar, Santo Domingo. In English and Spanish. (Abstract).
Sheldon, F.H. & Gill, F.B. (1996). A reconsideration of songbird phylogeny, with emphasis on the evolution of titmice and their sylvioid relatives. *Syst. Biol.* **45**: 473-495.
Sheldon, F.H. & Winkler, D.W. (1993). Intergeneric phylogenetic relationships of swallows estimated by DNA-DNA hybridization. *Auk* **110(4)**: 798-824.
Sheldon, F.H., Whittingham, L.A. & Winkler, D.W. (1999). A comparison of cytochrome *b* and DNA hybridization data bearing on the phylogeny of swallows (Aves: Hirundinidae). *Mol. Phylogen. Evol.* **11(2)**: 320-331.
Shelton, N. (1997). The first Hoopoe Lark *Alaemon alaudipes* in Turkey. *Sandgrouse* **19(2)**: 149-150.
Shepherd, M. (2002). Tree Pipit *Anthus trivialis*. Pp. 468-469 in: Wernham *et al.* (2002).
Sheppard, C.D. (1977). *Breeding in the Tree Swallow* (Iridoprocne bicolor) *and its Implications for the Evolution of Coloniality*. PhD thesis, Cornell University, Ithaca, New York.
Sherborn, C.D. (1897). Note on the dates of *The Zoology of the Beagle*. *Ann. Mag. Nat. Hist. (Ser. 6)* **20**: 483.
Sherley, G.H. (1989). Benefits of courtship-feeding for Rifleman (*Acanthisitta chloris*) parents. *Behaviour* **109(3-4)**: 303-318. In English with German summary.
Sherley, G.H. (1990a). Relative parental effort during incubation in Rifleman (*Acanthisitta chloris*). *New Zealand J. Zool.* **17**: 289-294.

Sherley, G.H. (1990b). Co-operative breeding in Riflemen (*Acanthisitta chloris*), benefits to parents, offspring and helpers. *Behaviour* **112(1-2)**: 1-22. In English with German summary.
Sherley, G.H. (1994). Co-operative parental care: contribution of the male Rifleman (*Acanthisitta chloris*) to the breeding effort. *Notornis* **41(1)**: 71-81.
Sherry, T.W. (1979). Competitive interactions and adaptive strategies of American Redstarts and Least Flycatchers in a northern hardwoods forest. *Auk* **96**: 265-283.
Sherry, T.W. (1983a). *Mionectes oleagineus* (Mosquitero Ojenido, Tontillo, Ochre-bellied Flycatcher). Pp. 586-587 in: Janzen (1983).
Sherry, T.W. (1983b). *Todirostrum cinereum* (Espatulilla Común, Pechita, Tontilla, Common Tody-flycatcher). Pp. 608-610 in: Janzen (1983).
Sherry, T.W. (1984). Comparative dietary ecology of sympatric insectivorous Neotropical flycatchers (Tyrannidae). *Ecol. Monogr.* **54(3)**: 313-338.
Sherry, T.W. (1985). Adaptation to a novel environment: food, foraging, and morphology of the Cocos Island Flycatcher. Pp. 908-920 in: Buckley *et al.* (1985).
Sherry, T.W. (1986). Nest, eggs, and reproductive behavior of the Cocos Flycatcher (*Nesotriccus ridgwayi*). *Condor* **88**: 531-532.
Shields, W.M. (1984a). Factors affecting nest and site fidelity in Adirondack Barn Swallows (*Hirundo rustica*). *Auk* **101**: 780-789.
Shields, W.M. (1984b). Barn Swallow mobbing: self-defence, collateral kin defence, group defence, or parental care? *Anim. Behav.* **32**: 132-148.
Shields, W.M. & Crook, J.R. (1987). Barn Swallow coloniality: a net cost for group breeding in the Adirondacks? *Ecology* **68**: 1373-1386.
Shields, W.M., Crook, J.R., Hebblethwaite, M.L. & Wiles-Ehmann, S.S. (1988). Ideal free coloniality in the swallows. Pp. 189-228 in: Slobodchikoff, C.N. ed. (1988). *The Ecology of Social Behavior*. Academic Press, New York.
Shigeta, Y. (1995). [Pied and Japanese Wagtails. (1). Identification of both species]. *Birder* **9**: 47-53. In Japanese.
Shigeta, Y. (1996a). [Pied and Japanese Wagtails. (2). Subspecies of Pied Wagtail and identification of age and sex of subspecies *lugens*]. *Birder* **10**: 46-52. In Japanese.
Shigeta, Y. (1996b). [Pied and Japanese Wagtails. (3). Identification of age and sex of Japanese Wagtail]. *Birder* **10**: 38-47. In Japanese.
Shillingford, N.F. (1965). Unusual nesting of the Larger Striped Swallow. *Bokmakierie* **17(1)**: 21.
Shirihai, H. (1986a). Identification of Oriental Skylark. *British Birds* **79(4)**: 186-197.
Shirihai, H. (1986b). The Small Skylark, a species new to Israel and the Middle East. *Sandgrouse* **7**: 47-54.
Shirihai, H. (1990). Possible hybrids between Yellow and Citrine Wagtails in Israel. *Dutch Birding* **12**: 18-19.
Shirihai, H. (1991a). First Dunn's Lark *Eremalauda dunni* nesting record in Israel. *Torgos* **9(2)**: 43-47.
Shirihai, H. (1991b). The invasion and breeding of Dunn's Lark *Eremalauda dunni* in the Arava Valley, Israel. *Sandgrouse* **13(1)**: 7-13.
Shirihai, H. (1994). Field identification of Dunn's, Bar-tailed Desert and Desert Larks. *Dutch Birding* **16(1)**: 1-9.
Shirihai, H. (1996). *The Birds of Israel*. Academic Press, London.
Shirihai, H. (1999). Fifty species new to Israel, 1979-1998: their discovery and documentation, with tips on identification. *Sandgrouse* **21(1)**: 45-105.
Shirihai, H. (2002). *The Complete Guide to Antarctic Wildlife: Birds and Marine Mammals of the Antarctic Continent and the Southern Ocean*. Princeton University Press, Princeton & Oxford.
Shirihai, H. (2003). *The Complete Guide to Antarctic Wildlife: Birds and Marine Mammals of the Antarctic Continent and the Southern Ocean*. Princeton University Press, Princeton & Oxford.
Shirihai, H. & Alström, P. (1990). Identification of Hume's Short-toed Lark. *British Birds* **83(7)**: 262-272.
Shirihai, H. & Colston, P.R. (1987). Siberian Water Pipits in Israel. *Dutch Birding* **9(1)**: 8-12. In English with Dutch summary.
Shirihai, H. & Colston, P.R. (1992). A new race of the Sand Martin *Riparia riparia* from Israel. *Bull. Brit. Orn. Club* **112(2)**: 129-132.
Shirihai, H. & Francis, J. (1999). Endemic birds of Ethiopia. *Alula* **5(1)**: 2-15.
Shirihai, H., Mullarney, K. & Grant, P. (1990). Identification of Dunn's, Bar-tailed and Desert Larks. *Birding World* **3(1)**: 15-21.
Shirling, A.E. (1935). Observations on the Violet-green Swallow. *Wilson Bull.* **47**: 192-194.
Shishkin, V.S. (1980). [The energetics of the trophic relations of the larks (Alaudidae) in the Caspian semi-desert]. *Zoologicheskii Zhurnal* **59(8)**: 1204-1216.
Shishkin, V.S. (1982). [Peculiarities of breeding of larks in semi-deserts of the northern Cis-Caspian Sea area]. *Ornitologiya* **17**: 83-90.
Shkedy, Y. & Safriel, U.N. (1991). Fat reserves of an opportunist and of a specialist species in the Negev Desert. *Auk* **108(3)**: 556-561.
Shkedy, Y. & Safriel, U.N. (1992a). Nest predation and nestling growth rate of two lark species in the Negev Desert, Israel. *Ibis* **134(3)**: 268-272.
Shkedy, Y. & Safriel, U.N. (1992b). Niche breadth of two lark species in the desert and the size of their geographical ranges. *Ornis Scand.* **23(1)**: 89-95.
Shobrak, M. (1998). Notes on the breeding and cooling behaviour of Hoopoe Lark *Alaemon alaudipes* in central Saudi Arabia. *Sandgrouse* **20(1)**: 53-55.
Shorey, L. (2002). Mating success on White-bearded Manakin (*Manacus manacus*) leks: male characteristics and relatedness. *Behav. Ecol. Sociobiol.* **52(6)**: 451-457.
Shorey, L., Piertney, S., Stone, J. & Höglund, J. (2000). Fine-scale genetic structuring on *Manacus manacus* leks. *Nature* **408(6810)**: 352-353.
Short, L.L. (1969). The southern races of the White-throated Spadebill (*Platyrinchus mystaceus*). *Auk* **86**: 265-270.
Short, L.L. (1975). *A Zoogeographical Analysis of the South American Chaco Avifauna*. Bulletin of the American Museum of Natural History **154(3)**, New York. 188 pp.
Short, L.L. (1976). Notes on a collection of birds from the Paraguayan Chaco. *Amer. Mus. Novit.* **2597**: 1-16.
Short, L.L. & Horne, J.F.M. (1985). Notes on some birds of Oi Ari Nyiro, Laikipia Plateau. *Scopus* **9**: 137-140.
Short, L.L., Horne, J.F.M. & Muringo-Gichuki, C. (1990). *Annotated Check-list of the Birds of East Africa*. Proceedings of the Western Foundation of Vertebrate Zoology **4(3)**. 186 pp.
Show, T.H. (1930). Notes on some summer birds of Chafoo, China. *Auk* **37**: 542-545.
Shrestha, T.K. (2000). *Birds of Nepal: Field Ecology, Natural History and Conservation*. Published privately.
Shuel, R. (1938). Notes on the breeding habits of birds near Zoria, N. Nigeria, with descriptions of their nests and eggs. *Ibis* **Ser. 14, no. 2**: 230-244.
Shuker, K. (1993). *The Lost Ark. New and Rediscovered Animals of the 20th Century*. Harper Collins, London.
Shukla, R.N. & Shrivastava, M. (1985). Some observations on nests and nesting behavior of three birds. *Comp. Physiol. Ecol.* **10(2)**: 77-78.
Shurupov, I.I. (1985). [Renesting of the Tree Pipit (*Anthus trivialis*)]. *Ornitologiya* **20**: 201-202. In Russian.
Siblet, J.P. & Tostain, O. (1984). Un male de Bergeronnette printanière, *Motacilla flava*, du type feldegg, nicheur en Seine-et-Marne (France). [A male Black-headed Wagtail *Motacilla flava* feldegg, bred successfully in 1980 near Montereau (Seine-et-Marne, France)]. *Nos Oiseaux* **37(6)**: 284-288. In French with German and English summary.
Sibley, C.G. ed. (1963). *Proceedings of the XIII International Ornithological Congress, Ithaca, June 1962*. Vol. 2. American Ornithologists' Union, Baton Rouge, Louisiana.
Sibley, C.G. (1970). *A Comparative Study of the Egg-white Proteins of Passerine Birds*. Peabody Museum of Natural History Yale University Bulletin **32**, New Haven, Connecticut. 132 pp.
Sibley, C.G. (1974). The relationships of the lyrebirds. *Emu* **74**: 65-79.
Sibley, C.G. (1976a). Protein evidence of the origin of certain Australasian birds. Pp. 66-70 in: Dorst (1976).
Sibley, C.G. (1976b). Protein evidence of the relationships of some Australian passerine birds. Pp. 557-570 in: Dorst (1976).
Sibley, C.G. (1996). *Birds of the World*. Version 2.0. Thayer Birding Software, Naples, Florida.
Sibley, C.G. (2000). *The Sibley Guide to Birds*. Alfred A. Knopf, New York.
Sibley, C.G. & Ahlquist, J.E. (1981). The relationships of the wagtails and pipits (Motacillidae) as indicated by the DNA-DNA hybridization. *Oiseau et RFO* **51**: 189-199.
Sibley, C.G. & Ahlquist, J.E. (1982). The relationships of the swallows (Hirundinidae). *J. Yamashina Inst. Orn.* **14**: 122-130.
Sibley, C.G. & Ahlquist, J.E. (1985a). The phylogeny and classification of the Australo-Papuan passerine birds. *Emu* **85**: 1-14.
Sibley, C.G. & Ahlquist, J.E. (1985b). The relationships of some groups of African birds, based on comparisons of the genetic material, DNA. Pp. 115-161 in: Schuchmann, K.L. ed. (1985). *Proceedings of the International Symposium of African Vertebrates*. Forschungsinstitut und Museum Alexander Koenig, Bonn.
Sibley, C.G. & Ahlquist, J.E. (1985c). Phylogeny and classification of New World suboscine passerine birds (Passeriformes: Oligomyodi: Tyrannides). Pp. 396-428 in: Buckley *et al.* (1985).
Sibley, C.G. & Ahlquist, J.E. (1990). *Phylogeny and Classification of Birds: a Study in Molecular Evolution*. Yale University Press, New Haven & London.
Sibley, C.G. & Monroe, B.L. (1990). *Distribution and Taxonomy of Birds of the World*. Yale University Press, New Haven & London.
Sibley, C.G. & Monroe, B.L. (1993). *A Supplement to Distribution and Taxonomy of Birds of the World*. Yale University Press, New Haven & London.
Sibley, C.G., Ahlquist, J.E. & Monroe, B.L. (1988). A classification of the living birds of the world based on DNA-DNA hybridization studies. *Auk* **105(3)**: 409-423.
Sibley, C.G., Lanyon, S.M. & Ahlquist, J.E. (1984). The relationships of the Sharpbill (*Oxyruncus cristatus*). *Condor* **86(1)**: 48-52.
Sibley, C.G., Williams, G.R. & Ahlquist, J.E. (1982). The relationships of the New Zealand wrens (Acanthisittidae) as indicated by DNA-DNA hybridization. *Notornis* **29(2)**: 113-130.
Sibson, R.B. (1974). Rock Wren using an anvil. *Notornis* **21(4)**: 305.
Sibson, R.B. (1982). *Birds at Risk. Rare or Endangered Species of New Zealand*. A.H. & A.W. Reed Ltd, Wellington.
Sick, H. (1954). Zur Biologie des amazonischen Schirmvogels, *Cephalopterus ornatus*. *J. Orn.* **95**: 233-244.
Sick, H. (1955). O Anambé Prêto, "*Cephalopterus ornatus*" Geoffroy Saint-Hilaire (Cotingidas, Aves). *Rev. Bras. Biol.* **15**: 361-376.
Sick, H. (1959). Zwei neue Pipriden aus Brasilien. *J. Orn.* **100**: 111-112..
Sick, H. (1960). Vergleichende Beobachtungen über die Balz brasilianischer Pipriden. Pp. 672-680 in: Bergman *et al.* (1960).
Sick, H. (1967). Courtship behavior in the manakins (Pipridae): a review. *Living Bird* **6**: 5-22.
Sick, H. (1970). Über Eier und Lebensweise der Weissflügel-Kotinga, *Xipholena atropurpurea*. *J. Orn.* **111**: 107-108.
Sick, H. (1971). Beobachtungen am Flammenkopf, *Oxyruncus*. *Bonn. Zool. Beitr.* **22(3-4)**: 255-260.
Sick, H. (1972). A ameaça de avifauna brasileira. Pp. 99-153 in: *Espécies da Fauna Brasileira Ameaçadas de Extinção*. Academia Brasileira de Ciências, Rio de Janeiro.
Sick, H. (1979a). Zur Nistweise der Cotingiden *Iodopleura* und *Xipholena*. [On nest building of Cotingidae *Iodopleura* and *Xipholena*]. *J. Orn.* **120(1)**: 73-77. In German with English summary.
Sick, H. (1979b). Notes on some Brazilian birds. *Bull. Brit. Orn. Club* **99(4)**: 115-120.
Sick, H. (1985). *Ornitologia Brasileira, uma Introdução*. Editora Universidade de Brasília, Brasília.
Sick, H. (1993). *Birds in Brazil. A Natural History*. Princeton University Press, Princeton, New Jersey.
Sick, H. (1997). *Ornitologia Brasileira*. Nova Fronteira. Rio de Janeiro.
Sick, H. & Teixeira, D.M. (1981). Nocturnal activities of Brazilian hummingbirds and flycatchers at artificial illumination. *Auk* **98**: 191-192.
Siderius, J.A. (1993). Nest defense in relation to nesting stage and response of parents to repeated model presentations in the Eastern Kingbird (*Tyrannus tyrannus*). *Auk* **110(4)**: 921-923.
Sieber, O. (1980). Causal and functional aspects of brood distribution in Sand Martins (*Riparia riparia* L.). *Z. Tierpsychol.* **52**: 19-56.
Sieber, O. (1985). Individual recognition of parental calls by Bank Swallow chicks (*Riparia riparia*). *Anim. Behav.* **33**: 107-116.
Siegfried, W.R. (1992). Conservation status of the South African endemic avifauna. *S. Afr. J. Wildl. Res.* **22(3)**: 61-64.
Siegfried, W.R., Frost, P.G.H. & Cooper, J. (1976). Rare and vulnerable birds in South Africa. *Biol. Conserv.* **10(2)**: 83-93.
Sikes, P.J. & Arnold, K.A. (1984). Movement and mortality estimates of Cliff Swallows in Texas. *Wilson Bull.* **96**: 419-425.
da Silva, J.M.C. (1990). A re-evaluation of *Serpophaga araguayae* Snethlage, 1928 (Aves: Tyrannidae). *Goeldiana Zool.* **1**: 1-6.
da Silva, J.M.C. (1993). The Sharpbill in the Serra dos Carajás, Pará, Brazil, with comments on altitudinal migration in the Amazon region. *J. Field Orn.* **64(3)**: 310-315.
da Silva, J.M.C. (1995). Birds of the cerrado region, South America. *Steenstrupia* **21**: 69-92.
da Silva, J.M.C. (1996a). New data support the specific status of Reiser's Tyrannulet, a central Brazilian endemic. *Bull. Brit. Orn. Club* **116(2)**: 109-113.
da Silva, J.M.C. (1996b). Distribution of Amazonian and Atlantic birds in gallery forests of the Cerrado region, South America. *Orn. Neotropical* **7**: 1-18.
da Silva, J.M.C. & Oren, D.C. (1990). Resultados de uma excursão ornitologica a ilha de Maraca, Roraima, Brasil. *Goeldiana Zool.* **5**: 1-8.
da Silva, J.M.C. & Oren, D.C. (1992). Notes on *Knipolegus franciscanus* Snethlage, 1928 (Aves: Tyrannidae), an endemism of central Brazilian dry forests. *Goeldiana. Zool.* **16**: 1-9.
da Silva, J.M.C., Oren, D.C., Roma, J.C. & Henriques, L.M.P. (1997). Composition and distribution patterns of the avifauna of an Amazonian upland savanna, Amapá, Brazil. Pp. 743-762 in: Remsen (1997).
Silveira, L.F. (1998). The birds of Serra da Canastra National Park and adjacent areas, Minas Gerais, Brazil. *Cotinga* **10**: 55-63.
Silveira, L.F., Olmos, F. & Long, A.J. (2003). Birds in Atlantic Forest fragments in north-east Brazil. *Cotinga* **20**: 32-46.
Simeonov, S.D. (1965). Über die Verbreitung der Rötelschwalbe *Hirundo daurica rufula* (Temminck) in Bulgarien. *Fragm. Balcan. Mus. Maced. Sci. Nat.* **16**: 115-120.
Simeonov, S.D. (1968). Über die Nistweise der Rötelschwalbe in Bulgarien. *J. Orn.* **109**: 57-61.
Simeonov, S.D. (1969). Zur Brutbiologie der Rötelschwalbe in Bulgarien. *J. Orn.* **110**: 499-500.
Simeonov, S.D. & Michev, T. (1980). [Studies on the distribution and numbers of Red-rumped Swallow *Hirundo daurica rufula* (Temminck) in Bulgaria]. *Ekology, Sofia* **7**: 84-92. In Bulgarian with English summary.
Simmons, K.E.L. (1951). Crested Lark imitating calls of redshank, greenshank and Green Sandpiper. *British Birds* **44**: 92-93.
Simmons, K.E.L. (1965). Patterns of dispersion of the White Wagtail and other birds outside the breeding season. *Bull. Brit. Orn. Club* **85**: 161-168.
Simmons, K.E.L. (1994). Sunning behaviour of juvenile Pied Wagtails. *British Birds* **87(5)**: 234-235.
Simms, E. (1992). *British Larks, Pipits and Wagtails*. Harper Collins, London.
Simon, J.E. (2000). Um novo registro do ninho de *Attila rufus*. Pp. 370-371 in: Straube *et al.* (2000). (Abstract).
Simon, J.E. & Pacheco, S. (1996). Reprodução de *Corythopis delalandi* (Lesson, 1830). *Rev. Bras. Biol.* **56**: 671-676.
Simon, J.E., Ribon, R., Mattos, G.M. & Abreu, C.R.M. (1999). A avifauna do Parque Estadual da Serra do Brigadeiro, Minas Gerais. *Revista Árvore* **23(1)**: 33-48.
Simon, P. (1965). Synthèse de l'avifaune du massif montagneux du Tibesti et distribution géographique de ces espèces en Afrique du Nord et environs. *Gerfaut* **55**: 26-71.
Simpson, J.H. (1971). Tawny Pipit in Shetland. *Scottish Birds* **6(6)**: 338.
Simpson, K. & Day, N. (1998). *Field Guide to the Birds of Australia*. 6th edition. Princeton University Press, Princeton, New Jersey.
Sinclair, J.C. (1998). Gabon, Sao Tomé and Principe. *Sunbird* **28(1)**: 1-4.
Sinclair, J.C. (2003). Enigma revealed: the African River Martin. *Africa. Birds & Birding* **8(5)**: 24-27.
Sinclair, J.C. & Davidson, I. (1995). *Southern African Birds. A Photographic Guide*. Struik, Cape Town.
Sinclair, J.C. & Hockey, P. (1996). *The Larger Illustrated Guide to Birds of Southern Africa*. Struik, Cape Town.
Sinclair, J.C. & Langrand, O. (1998). *Birds of the Indian Ocean Islands*. Struik, Cape Town.
Sinclair, J.C. & Ryan, P. (2003). *Birds of Africa South of the Sahara*. Struik, Cape Town.
Sinclair, J.C. & Sinclair, J. (1995). *A Photographic Guide to Birds of Namibia*. Struik, Cape Town.
Sinclair, J.C., Hockey, P. & Tarboton, W. (1993). *Illustrated Guide to the Birds of Southern Africa*. New Holland, London.
Singer, D. & Nicolai, J. (1990). Organisationsprinzipien im Gesang der Heidelerche (*Lullula arborea*). *J. Orn.* **131(3)**: 279-290.
Singh, P. (1994). Recent bird records from Arunachal Pradesh, India. *Forktail* **10**: 65–104.
Sinha, S. & Sinha, R.C. (1984). Seasonal variations in the fat and glycogen contents of the liver and the pectoralis muscle of the migratory bird *Calandrella acutirostris tibetana*. *J. Comp. Physiol. Ecol.* **9(1)**: 41-46.
Sitters, H.P. (1986). Woodlarks in Britain, 1963-83. *British Birds* **79(3)**: 105-116.
Sitters, H.P., Fuller, R.J., Hoblyn, R.A., Wright, M.T., Cowie, N. & Bowden, C.G.R. (1996). The Woodlark *Lullula arborea* in Britain: population trends, distribution and habitat occupancy. *Bird Study* **43(2)**: 172-187.
Skakuj, M. & Stawarczyk, T. (1997). Five new bird species in Bahrain. *Sandgrouse* **19(1)**: 39-44.
Skead, C.J. (1954). A study of Cape Wagtails *Motacilla capensis*. *Ibis* **96(1)**: 91-103.
Skead, D.M. (1964). Birds of the Anatiol forests, King William's Town and Stutterheim, C.P. *Ostrich* **35**: 142-159.
Skead, D.M. (1966). Birds frequenting the intertidal zone of the Cape Peninsula. *Ostrich* **37**: 10-16.

Skead, D.M. (1975). Drinking habits of birds in the central Transvaal bushveld. *Ostrich* **46(2)**: 139-146.
Skead, D.M. (1979). Feeding associations of *Hirundo spilodera* with other animals. *Bokmakerie* **31(3)**: 63.
Skegg, P.D.G. (1962). A check on Welcome Swallows in northern Northland. *Notornis* **10(2)**: 88-90.
Skerrett, A., Bullock, I. & Disley, T. (2001). *Birds of Seychelles*. Christopher Helm, London.
Skinner, N.J. (1986). Report from the records sub-committee. *Babbler* **11**: 50, 54-55.
Skinner, N.J. (1989). The nest record card scheme. *Babbler* **18**: 47-48.
Skutch, A.F. (1930). The habits and nesting activities of the northern Tody Flycatcher in Panama. *Auk* **47(3)**: 313-322.
Skutch, A.F. (1951). Life history of the Boat-billed Flycatcher. *Auk* **68**: 30-49.
Skutch, A.F. (1952). Life history of the Blue-and-white Swallow. *Auk* **69**: 392-406.
Skutch, A.F. (1954). *Life Histories of Central American Birds*. Vol. 1. Pacific Coast Avifauna **31**. Cooper Ornithological Society, Berkeley, California.
Skutch, A.F. (1960). *Life Histories of Central American Birds*. II. Pacific Coast Avifauna **34**. Cooper Ornithological Society, Berkeley, California.
Skutch, A.F. (1967). *Life Histories of Central American Highland Birds*. Publications of the Nuttall Ornithological Club **7**, Cambridge, Massachusetts. 213 pp.
Skutch, A.F. (1969). *Life Histories of Central American Birds*. III. Pacific Coast Avifauna **35**. Cooper Ornithological Society, Berkeley, California. 580 pp.
Skutch, A.F. (1970). The display of the Yellow-billed Cotinga *Carpodectes antoniae*. *Ibis* **112(1)**: 115-116.
Skutch, A.F. (1971). Life history of the Bright-rumped Attila *Attila spadiceus*. *Ibis* **113(3)**: 316-322.
Skutch, A.F. (1972). *Studies of Tropical American Birds*. Publications of the Nuttall Ornithological Club **10**, Cambridge, Massachusetts. 228 pp.
Skutch, A.F. (1976). *Parent Birds and their Young*. University of Texas Press, Austin, Texas.
Skutch, A.F. (1977). *A Bird Watcher's Adventures in Tropical America*. University of Texas Press, Austin, Texas.
Skutch, A.F. (1981). *New Studies of Tropical American Birds*. Publications of the Nuttall Ornithological Club **19**, Cambridge, Massachusetts. 281 pp.
Skutch, A.F. (1985). Clutch size, nesting success, and predation on nests of Neotropical birds, reviewed. Pp. 575-594 in: Buckley *et al*. (1985).
Skutch, A.F. (1997). *Life of the Flycatcher*. University of Oklahoma Press, Norman, Oklahoma & London.
Skutch, A.F. (1999). *Trogons, Laughing Falcons, and Other Neotropical Birds*. Texas A & M University Press, College Station, Texas.
Slagsvold, T. & Tohwer, S. (2000). Behavioral domination of food delivery by Tree Swallow nestlings. *Wilson Bull.* **112(2)**: 278-281.
Slater, G. (1997). Healesville Sanctuary, Victoria, Australia. *Int. Zoo News* **44(8)**: 493.
Slater, P. (1978). *Rare and Vanishing Australian Birds*. Rigby, Adelaide, Australia.
Slater, P., Slater, P. & Slater, R. (1989). *The Slater Field Guide to Australian Birds*. Weldon, Sydney.
Slipp, J.W. (1942). Vagrant occurrences of *Tyrannus melancholicus* in North America. *Auk* **59**: 310-312.
Slud, P. (1960). *The Birds of Finca "La Selva", Costa Rica: a Tropical Wet Forest Locality*. Bulletin of the American Museum of Natural History **121**, New York. 96 pp.
Slud, P. (1964). *The Birds of Costa Rica. Distribution and Ecology*. Bulletin of the American Museum of Natural History **128**, New York. 430 pp.
Slud, P. (1967). The birds of Cocos Island. *Bull. Amer. Mus. Nat. Hist.* **134**: 261-296.
Slud, P. (1980). *The Birds of Hacienda Palo Verde, Guanacaste, Costa Rica*. Smithsonian Contributions to Zoology **292**. 92 pp.
Small, A. (1994). *California Birds: their Status and Distribution*. Ibis Publishing Company, Vista, California.
Small, B. (1997). Head pattern of Blyth's Pipit. *Dutch Birding* **19(4)**: 189-190.
Small, B. (2002). The Horned Lark on the Isles of Scilly. *Birding World* **15(3)**: 111-120.
Smart, C. (1999). The Red-chested Cuckoo and the Striped Pipit. *Albatross* **337**: 16.
Smetana, N. & Guseva, V.S. (1981). [Food habits of the Tawny Pipit (*Anthus campestris*) in the Naurzum pine-forest]. *Ornitologya* **16**: 88-92.
Smith, G.A. & Jackson, J.A. (2002). Gray Kingbird (*Tyrannus dominicensis*). No. **668** in: Poole, A.F. & Gill, F.B. eds. (2002). *The Birds of North America*. Vol. 17. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Smith, G.T. (1976). Ecological and behavioural comparisons between Atrichornithidae and Menuridae. Pp. 125-136 in: Dorst (1976).
Smith, G.T. (1977). The effect of environmental change on six rare birds. *Emu* **77(4)**: 173-179.
Smith, G.T. (1985a). Scrub-bird. Pp. 525-526 in: Campbell & Lack (1985).
Smith, G.T. (1985b). Population and habitat selection of the Noisy Scrub-bird, *Atrichornis clamosus*, 1962 to 1983. *Austr. Wildl. Res.* **12(3)**: 479-485.
Smith, G.T. (1985c). Fire effects on populations of the Noisy Scrub-bird (*Atrichornis clamosus*), Western Bristlebird (*Dasyornis longirostris*), and Western Whipbird (*Psophodes nigrogularis*). Pp. 95-101 in: Ford, J.R. ed. (1985). *Fire Ecology and Management of Ecosystems in Western Australia*. Western Australian Institute of Technology, Perth.
Smith, G.T. (1985d). Natal downs and plumage changes in the Noisy Scrub-bird, *Atrichornis clamosus* (Passeriformes: Atrichornithidae). *Records Austr. Mus.* **37(3-4)**: 157-163.
Smith, G.T. (1985e). The Noisy Scrub Bird *Atrichornis clamosus*. Does its past suggest a future? Pp. 301-308 in: Keast, A., Recher, H.F., Ford, H. & Saunders, D. (1985). *Birds of Eucalypt Forests and Woodlands: Ecology, Conservation, Management*. Surrey Beatty, Sydney.
Smith, G.T. & Calver, M.C. (1984). The diet of the nestling Noisy Scrub-bird, *Atrichornis clamosus*. *Austr. Wildl. Res.* **11(3)**: 553-558.
Smith, G.T. & Danks, A. (1994). Fire and rare species conservation in coastal southwest Australia. Page 492 in: Dittami (1994). (Abstract).
Smith, G.T. & Forrester, R.I. (1981a). The status of the Noisy Scrub-bird (*Atrichornis clamosus*) in captivity. *West. Austr. Nat.* **15**: 151-157.
Smith, G.T. & Forrester, R.I. (1981b). The status of the Noisy Scrub-bird *Atrichornis clamosus*. *Biol. Conserv.* **19(4)**: 239-254.
Smith, G.T. & Robinson, F.N. (1976). The Noisy Scrub-bird - an interim report. *Emu* **76(1)**: 37-43.
Smith, H.G. & Montgomerie, R. (1991). Sexual selection and the tail ornaments of North American Barn Swallows. *Behav. Ecol. Sociobiol.* **28**: 195-201.
Smith, H.G. & Montgomerie, R. (1992). Male incubation in Barn Swallows: the influence of nest temperature and sexual selection. *Condor* **94**: 750-759.
Smith, H.G., Montgomerie, R., Poldmaa, T., White, B.N. & Boag, P.T. (1991). DNA fingerprinting reveals relation between tail ornaments and cuckoldry in Barn Swallows, *Hirundo rustica*. *Behav. Ecol.* **2**: 90-98.
Smith, J.A. (1979). Observations on the nest of the Singing Bushlark. *West. Austr. Nat.* **14(6)**: 160.
Smith, K.D. (1957). An annotated list of the birds of Eritrea. *Ibis* **99(1)**: 307-337.
Smith, K.D. (1965). On the birds of Morocco. *Ibis* **107(4)**: 493-526.
Smith, K.D. (1968a). Some remarks on *Motacilla alba subpersonata*. *Ibis* **110(1)**: 90-91.
Smith, K.D. (1968b). Spring migration through southeast Morocco. *Ibis* **110(4)**: 452-472.
Smith, L.H. (1968). *The Lyrebird*. Lansdowne Press, Melbourne.
Smith, L.H. (1982). Moulting sequences in the development of the tail plumage of the Superb Lyrebird *Menura novaehollandiae*. *Austr. Wildl. Res.* **9(2)**: 311-330.
Smith, L.H. (1988). *The Life of the Lyrebird*. Heinemann, Melbourne.
Smith, L.H. (1990). A method for determining the curvature of natural forms and its application to certain tail feathers of the Superb Lyrebird *Menura novaehollandiae*. *Emu* **90(4)**: 231-240.
Smith, L.H. (1994). A critical analysis of the factors responsible for the decline of the Superb Lyrebird *Menura novaehollandiae* in Sherbrooke Forest. *Austr. Bird Watcher* **15(6)**: 238-249.
Smith, L.H. (1995). Response by Smith. *Austr. Bird Watcher* **16(2)**: 85-87.
Smith, L.H. (1999). Structural changes in the main rectrices of the Superb Lyrebird *Menura novaehollandiae* in the development of the filamentary feathers. *Emu* **99(1)**: 46-59.
Smith, L.H. (2004). Structural changes in the lyrate feathers in the development of the tail plumage of the Superb Lyrebird, *Menura novaehollandiae*. *Emu* **104(1)**: 59-73.
Smith, M.J. & Graves, H.B. (1978). Some factors influencing mobbing behavior in Barn Swallows (*Hirundo rustica*). *Behav. Biol.* **23**: 355-372.
Smith, N.G. (1985). Sharpbill. Page 533 in: Campbell & Lack (1985).
Smith, P.W. (2001). Comments on George F. Gaumer and the provenance of a Giant Kingbird *Tyrannus cubensis* specimen from Mexico. *Bull. Brit. Orn. Club* **121(4)**: 249-252.
Smith, P.W. & Evered, D.S. (1992). La Sagra's Flycatcher. *Birding* **24**: 294-297.
Smith, P.W. & Smith, S.A. (1989). The Bahama Swallow *Tachycineta cyaneoviridis*: a summary. *Bull. Brit. Orn. Club* **109(3)**: 170-180.
Smith, P.W. & Smith, S.A. (1990). The identification and status of the Bahama Swallow in Florida. *Birding* **22(6)**: 264-271.
Smith, P.W., Robertson, W.B. & Stevenson, H.M. (1988). West Indian Cave Swallows nesting in Florida, with comments on the taxonomy of *Hirundo fulva*. *Florida Field Nat.* **16**: 86-90.
Smith, P.W., Woolfenden, G.E. & Sprunt, A. (2000). The Loggerhead Kingbird in Florida: the evidence revisited. *North Amer. Birds* **54**: 235-240.
Smith, R.T. (1994). A successful artificial Sand Martin banking. *Scottish Birds* **17**: 237-238.
Smith, S. (1950). *The Yellow Wagtail*. Collins, London.
Smith, V.W. & Ebbutt, D. (1965). Notes on Yellow Wagtails *Motacilla flava* wintering in central Nigeria. *Ibis* **107(3)**: 390-393.
Smith, W.J. (1962). The nest of *Pitangus lictor*. *Auk* **79**: 108-111.
Smith, W.J. (1966). *Communication and Relationships in the Genus* Tyrannus. Publications of the Nuttall Ornithological Club **6**, Cambridge, Massachusetts. 250 pp.
Smith, W.J. (1967). Displays of the Vermilion Flycatcher (*Pyrocephalus rubinus*). *Condor* **69**: 601-605.
Smith, W.J. (1969). Displays of *Sayornis phoebe* (Aves, Tyrannidae). *Behaviour* **33**: 283-322.
Smith, W.J. (1971). Behavioral characteristics of Serpophaginine Tyrannids. *Condor* **73(3)**: 259-286.
Smith, W.J. (2001). Using interactive playback to study how songs and singing contribute to communication about behavior. Pp. 377-397 in: Kroodsma & Miller (1996).
Smith, W.J. & Vuilleumier, F. (1971). Evolutionary relationships of some South American Ground Tyrants. *Bull. Mus. Comp. Zool.* **41**: 259-286.
Smithe, F.B. (1966). *The Birds of Tikal*. Natural History Press, Garden City, New York.
Smits, J.E., Wayland, M.E., Miller, M.J., Liber, K. & Trudeau, S. (2000). Reproductive, immune, and physiological end points in Tree Swallows on reclaimed oil sands mine sites. *Environm. Toxicol. Chem.* **19**: 2951-2960.
Smyth, A.P., Orr, B.K. & Fleischer, R.C. (1993). Electrophoretic variants of egg white transferrin indicate a low rate of intraspecific brood parasitism in colonial Cliff Swallows in the Sierra Nevada, California. *Behav. Ecol. Sociobiol.* **32(2)**: 79-84.
Smyth, C.H. (1928). Descripción de una colección de huevos de aves argentinas. *Hornero* **4**: 126-152.
Smythies, B.E. (1986). *The Birds of Burma*. Nimrod Press Ltd, Liss, UK.
Smythies, B.E. (1999). *Birds of Borneo*. 4th edition revised by G. W. H. Davison. Natural History Publications, Kota Kinabalu.
Snapp, B.D. (1973). *The Occurrence of Colonial Breeding in the Barn Swallow (*Hirundo rustica*) and its Adaptive Significance*. PhD thesis, Cornell University, Ithaca, New York.
Snapp, B.D. (1976). Colonial breeding in the Barn Swallow (*Hirundo rustica*) and its adaptive significance. *Condor* **78**: 471-480.
Snell, M.L. (1963a). A study of the Blue Swallow (*Hirundo atrocaerulea*). *Bokmakierie* **15(1)**: 4-7.
Snell, M.L. (1963b). Birds at 7000 feet in an area of montane grassland on the eastern border of southern Rhodesia. *Ostrich* **34(1)**: 36-39.
Snell, M.L. (1969). Notes on the breeding of the Blue Swallow. *Ostrich* **40**: 65-74.
Snell, M.L. (1970). Nesting behaviour of a pair of Blue Swallows. *Bokmakierie* **22(2)**: 27-29.
Snell, M.L. (1979). The vulnerable Blue Swallow. *Bokmakierie* **31(4)**: 74-78.
Snell, M.L. (1981). Blue Swallows at Inyanga. *Honeyguide* **106**: 33.
Snell, M.L. (1988). Local extinction of the Blue Swallow at Nyanga. *Honeyguide* **34**: 30-31.
Snethlage, E. (1935). Beitrage zur Fortpflanzungs-biologie brasilianischer Vögel. *J. Orn.* **83**: 532-562.
Snow, B.K. (1961). Notes on the courtship behavior of three Cotingidae. *Auk* **78(2)**: 150-161.
Snow, B.K. (1970). A field study of the Bearded Bellbird in Trinidad. *Ibis* **112(3)**: 299-329.
Snow, B.K. (1972). A field study of the Calfbird *Perissocephalus tricolor*. *Ibis* **114(2)**: 139-162.
Snow, B.K. (1973). Notes on the behavior of the White Bellbird. *Auk* **90(4)**: 743-751.
Snow, B.K. (1977). Territorial behavior and courtship of the male Three-wattled Bellbird. *Auk* **94(4)**: 623-645
Snow, B.K. (1978). Calls and display of the male Bare-throated Bellbird. *Avicult. Mag.* **84(3)**: 157-161.
Snow, B.K. & Snow, D.W. (1979). The Ochre-bellied Flycatcher and the evolution of lek behavior. *Condor* **81**: 286-292.
Snow, B.K. & Snow, D.W. (1985). Display and related behavior of male Pin-tailed Manakins. *Wilson Bull.* **97(3)**: 273-282.
Snow, D.W. (1961). The displays of the manakins *Pipra pipra* and *Tyranneutes virescens*. *Ibis* **103A**: 110-113.
Snow, D.W. (1962a). A field study of the Black and White Manakin, *Manacus manacus*, in Trinidad. *Zoologica* **47**: 65-104.
Snow, D.W. (1962b). A field study of the Golden-headed Manakin, *Pipra erythrocephala*, in Trinidad, W.I. *Zoologica* **47**: 183-198.
Snow, D.W. (1963a). The display of the Orange-headed Manakin. *Condor* **65(1)**: 44-48.
Snow, D.W. (1963b). The display of the Blue-backed Manakin, *Chiroxiphia pareola*, in Tobago, W.I. *Zoologica* **48**: 167-175.
Snow, D.W. (1963c). The evolution of manakin displays. Pp. 553-561 in: Sibley (1963).
Snow, D.W. (1971a). Observations on the Purple-throated Fruit-crow in Guyana. *Living Bird* **10**: 5-17.
Snow, D.W. (1971b). Social organization of the Blue-backed Manakin, *Wilson Bull.* **83(1)**: 35-38.
Snow, D.W. (1971c). Notes on the biology of the Cock-of-the-rock. *J. Orn.* **112**: 323-333.
Snow, D.W. (1973a). Distribution, ecology and evolution of the bellbirds (*Procnias*, Cotingidae). *Bull. Brit. Mus. (Nat. Hist.) Zool.* **25(9)**: 369-391.
Snow, D.W. (1973b). *The Classification of the Cotingas*. Breviora **409**. 28 pp.
Snow, D.W. (1975a). The classification of the manakins. *Bull. Brit. Orn. Club* **95(1)**: 20-27.
Snow, D.W. (1975b). *Laniisoma elegans* in Peru. *Auk* **92(3)**: 583-584.
Snow, D.W. (1976a). The relationship between climate and annual cycles in the Cotingidae. *Ibis* **118(3)**: 366-401.
Snow, D.W. (1976b). *The Web of Adaptation: Bird Studies in the American Tropics*. Quadrangle & Collins, New York & London.
Snow, D.W. (1977a). The display of the Scarlet-horned Manakin *Pipra cornuta*. *Bull. Brit. Orn. Club* **97(1)**: 23-27.
Snow, D.W. (1977b). Duetting and other synchronised displays of the Blue-backed manakins, *Chiroxiphia* spp. Pp. 239-251 in: Stonehouse, B. & Perrins, C. eds. (1977). *Evolutionary Ecology*. Macmillan, London.
Snow, D.W. (1977c). Waltzing cotingas. *Animal Kingdom* **80(4)**: 13-18.
Snow, D.W. (1978). The nest as a factor determining clutch-size in tropical birds. *J. Orn.* **120**: 73-77.
Snow, D.W. (1980). A new species of cotinga from southeastern Brazil. *Bull. Brit. Orn. Club* **100(4)**: 213-215.
Snow, D.W. (1982). *The Cotingas: Bellbirds, Umbrellabirds and their Allies*. British Museum of Natural History & Oxford University Press, London.
Snow, D.W. (1985a). Affinities and recent history of the avifauna of Trinidad and Tobago. Pp. 238-246 in: Buckley *et al*. (1985).
Snow, D.W. (1985b). Cotinga. Pp. 111-112 in: Campbell & Lack (1985).
Snow, D.W. (1985c). Manakin. Pp. 337-338 in: Campbell & Lack (1985).
Snow, D.W. & Goodwin, D. (1974). The Black-and-gold Cotinga. *Auk* **91(2)**: 360-369.
Snow, D.W. & Lill, A. (1974). Longevity records for some Neotropical land birds. *Condor* **76(3)**: 262-267.
Snow, D.W. & Perrins, C.M. eds. (1998). *The Birds of the Western Palearctic. Concise Edition*. Vol. 2. Passerines. Oxford University Press, Oxford & New York.
Snow, D.W. & Snow, B.K. (1992). Display of the Golden-winged Manakin *Masius chrysopterus*. *Bull. Brit. Orn. Club* **112(4)**: 264-270.
Snyder, D.E. (1966). *The Birds of Guyana*. Peabody Museum, Salem, Massachusetts.
Snyman, T. (1991). Recent sightings: co-operative feeding. *Albatross* **307**: 19.
Socarrás, E. (2001). Characterization of the avifauna of the west-central portion of the Jardines de la Reina Archipelago, Cuba. *Pitirre* **14(2)**: 75-76. (Abstract).
Sogge, M.K. (1997). Primary song by a juvenile Willow Flycatcher. *J. Field Orn.* **68(4)**: 630-631.
Sogge, M.K., Tibbitts, T.J. & Petterson, J.R. (1997). Status and breeding ecology of the Southwestern Willow Flycatcher in the Grand Canyon. *Western Birds* **28**: 142-157.
Soler, J.J., Cuervo, J.J., Møller, A.P. & de Lope, F. (1998). Nest building is a sexually selected behaviour in the Barn Swallow. *Anim. Behav.* **56**: 1435-1442.
van Someren, V.D. (1947). Field notes on some Madagascar birds. *Ibis* **89(2)**: 235-267.
van Someren, V.G.L. (1916). A list of birds collected in Uganda and British East Africa with notes on their nesting and other habits. Part II. *Ibis* **Ser. 10, no. 4**: 373-472.
van Someren, V.G.L. (1956). *Days with Birds - Studies of Habits of some East African Species*. Fieldiana Zoology **38**. 520 pp.

van Someren, V.G.L. (1958). *A Birdwatcher in Kenya*. Oliver & Boyd, Edinburgh.
van Someren, V.G.L. & van Someren, G.R.C. (1949). *The Birds of Bwamba*. The Uganda Society, Kampala.
Sonobe, K. ed. (1982). *Field Guide to the Birds of Japan*. Wild Bird Society of Japan, Tokyo.
Soper, M.F. (1961a). Observations on Rock Wrens near the Homer Tunnel. *Notornis* **9(5)**: 158-161, 163-165.
Soper, M.F. (1961b). Are Riflemen polygamous? *Notornis* **9(4)**: 124, 129, 133.
Soper, M.F. (1976). *New Zealand Birds*. 2nd edition. Whitcoulls Ltd, Christchurch.
Sophasan, S. & Dobias, Q. (1984). The fate of the "Princess Bird" or White-eyed River Martin (*Pseudochelidon sirintarae*). *Nat. Hist. Bull. Siam Soc.* **32(1)**: 1-10.
Sorace, A. (1986). Osservazione di una Rondine montana, *Hirundo rupestris*, con il coppone bianco. *Riv. Ital. Orn.* **56(3&4)**: 262.
Sørensen, U.G., Bech, J. & Krabbe, E. (1996). New and unusual records of birds in Cameroon. *Bull. Brit. Orn. Club* **116(3)**: 145-155.
Soto, J.M.R., Filippini, A. & Mincarone, M.M. (2000). Lista sitemática das aves registradas no Arquipélago Fernando de Noronha, com novas inlusões. Pp. 352-353 in: Straube *et al.* (2000). (Abstract).
Southern, W.E. (1959a). Homing of Purple Martins. *Wilson Bull.* **71**: 254-261.
Southern, W.E. (1959b). Foster-feeding and polygamy in the Purple Martin. *Wilson Bull.* **71**: 96.
Southern, W.E. (1968). Experiments on the homing ability of Purple Martins. *Living Bird* **7**: 71-84.
de Souza, C.R. (2000). Levantamento preliminar da avifauna da mata de galeria nas margens do Rio Sucuriú, Mato Grosso do Sul. Pp. 384-385 in: Straube *et al.* (2000). (Abstract).
Souza, D.G.S. (1999). Novos registros de espécies de aves no estado da Bahia e sua correlação com os ecossistemas. *Atualidades Orn.* **88**: 6-7.
Souza, D.G.S. (2002). *All the Birds of Brazil. An Identification Guide*. Dall, Bahia.
Souza, R.P., Souza, M.F.C.G., Flauto, G. & Pereira, L.E. (1998). Comparação da dinâmica populacional das andorinhas *Hirundo rustica*, *Stelgidopteryx ruficollis* e *Notiochelidon cyanoleuca* (Hirundinidae) no Estado de São Paulo. Page 122 in: *Resumos do VII Congresso Brasileiro de Ornitologia, Rio de Janeiro, 12 a 17 de Julho de 1998*.
Soy, J.P. (1997). Aggressive behavior of a Gray Kingbird (*Tyrannus dominicensis*) toward a bat (*Molossus molossus*) in La Habana, Cuba. *Pitirre* **10(3)**: 97-98.
Spaepen, J.F. (1988). Estimation of the survival rates of Meadow Pipits - a comparison of two different methods. *Ringing & Migration* **9(2)**: 117-128.
Spaepen, J.F. (1989). Spring migration of the Meadow Pipit (*Anthus pratensis*) through Belgium. *Gerfaut* **79**: 91-100.
Spaepen, J.F. (1995). A study of the migration of the Skylark, *Alauda arvensis*, based on European ringing data. *Gerfaut* **85**: 63-89.
Spaepen, J.F. (1996). Estimating the size of migratory populations based on ringing data. Application to the Skylark (*Alauda arvensis*). *Gerfaut* **85**: 91-93.
Spaepen, J.F. & Van Cauteren, F. (1968). Migration of the Skylark *Alauda arvensis* L. (new results). *Gerfaut* **58**: 24-77.
Spearpoint, S. (1990). Observations on the Pearlbreasted Swallow at Tankatara. *Bee-eater* **41**: 12.
Spee, J. (2001). Nachwuchs bei den Prachtpipras. *Gefiederte Welt* **125(7)**: 266-267..
Speich, S.M., Jones, H.L. & Benedict, E.M. (1986). Review of the natural nesting of the Barn Swallow in North America. *Amer. Midl. Nat.* **115**: 248-254.
Spencer, S.J. (1962). *A Study of the Physical Characteristics of Nesting Sites Used by Bank Swallows*. PhD thesis, Pennsylvania State University, Pennsylvania.
Spina, F. & Massi, A. (1992). Post-nuptial moult and fat accumulation of the Ashy-headed Wagtail (*Motacilla flava cinereocapilla*) in northern Italy. *Vogelwarte* **36(3)**: 211-220. In English with German summary.
Spina, F., Massi, A. & Montemaggiori, A. (1995). Back from Africa: Who's running ahead? Aspects of differential migration of sex and age classes of Palearctic-African spring migrants. *Ostrich* **65**: 137-150.
Spjøtvoll, O. (1970). [On *Eremophila alpestris* in a mountain area in Norway]. *Sterna* **9**: 163-174.
Spottiswoode, C. & Ryan, P.G. (2002). First record of Mascarene Martin *Phedina borbonica* in Sul do Save, Mozambique. *Bird Notes* **11**: 23.
Spottiswoode, C., Cohen, C. & Hester, A. (2001). First breeding records of the South African Cliff Swallow in Botswana. *Babbler* **39**: 52.
Sprunt, A. (1944). Remarkable aerial behavior of the Purple Martin. *Auk* **61**: 296-297.
Sprunt, A. Jr. & Chamberlain, E.B. (1970). *South Carolina Bird Life*. Revised edition. University of South Carolina Press, Columbia, South Carolina.
Srinivas, K.V. & Subramanya, S. (2000). Termite attack on nest material leadings to desertion of eggs by birds. *J. Bombay Nat. Hist. Soc.* **97(1)**: 145.
Srinivasulu, C. & Srinivasulu, B. (1997). Avifaunal diversity of Medchal Mandal, Rangareddi District, Andhra Pradesh. *Mayura* **14**: 23-36.
St. Louis, V.L. & Barlow, J.C. (1993). The reproductive success of Tree Swallows nesting near experimentally acidified lakes in northwestern Ontario. *Can. J. Zool.* **71**: 1090-1097.
St. Louis, V.L. & Breebaart, L. (1991). Calcium supplements in the diet of nestling Tree Swallows near acid sensitive lakes. *Condor* **93**: 286-294.
St. Louis, V.L., Breebaart, L. & Barlow, J.C. (1990). Foraging behavior of Tree Swallows over acidified and nonacidic lakes. *Can. J. Zool.* **68**: 2385-2392.
St. Louis, V.L., Breebaart, L., Barlow, J.C. & Klaverkamp, J.F. (1993). Metal accumulation and metallothionein concentrations in Tree Swallow nestlings near acidified lakes. *Environm. Toxicol. Chem.* **12**: 1203-1207.
St. Paul, R. & McKenzie, H.R. (1976). A bushman's seventeen years of noting birds. Part C. North Island Rifleman, Whitehead Pied Tit and North Island Robin. *Notornis* **23(3)**: 220-232.
St. Paul, R. & McKenzie, H.R. (1977). A bushman's seventeen years of noting birds. Part F. Conclusion of series. Notes on other native birds. *Notornis* **24**: 65-74.
Stadler, H. (1928). Die Stimme der Felsenschwalbe (*Ptyonoprogne rupestris*). *Orn. Beob.* **25**: 53-56.
Stahl, J. (1989). Biologie, Haltung und Zucht der Haubenlerche *Galerida cristata* (Linnaeus 1758). *Gefiederte Welt* **113(12)**: 368-371.
Stahl, J. (2001). Zuchterfahrungen mit der Heidelerche. *Gefiederte Welt* **125(9)**: 330-332.
Staicer, C.A., Spector, D.A. & Horn, A.G. (1996). The dawn chorus and other diel patterns in acoustic signaling. Pp. 426-453 in: Kroodsma & Miller (1996).
Stanford, J.K. (1954). A survey of the ornithology of northern Lybia. *Ibis* **96(3)**: 449-473; **96(4)**: 606-624.
Stanford, J.K. & Mayr, E. (1941). The Vernay-Cutting Expedition to Northern Burma. Part 4. *Ibis* **Ser. 14, no. 5**: 353-378.
Stap, D. (1990). *A Parrot Without a Name: the Search for the Last Unknown Birds on Earth*. University of Texas Press, Austin, Texas.
Stap, D. (2000a). The bell of the rainforest. *Living Bird* **19(4)**: 21-24.
Stap, D. (2000b). Bonk, bonk - it's a Three-wattled Bellbird. *Audubon Bull.* **102(3)**: 98-103.
Stark, A.C. & Sclater, W.L. (1900). *The Fauna of South Africa: Birds*. R.H. Porter, London.
Stattersfield, A.J. & Capper, D.R. eds. (2000). *Threatened Birds of the World*. Lynx Edicions & BirdLife International, Barcelona & Cambridge.
Stattersfield, A.J., Crosby, M.J., Long, A.J. & Wege, D.C. (1998). *Endemic Bird Areas of the World. Priorities for Biodiversity Conservation*. BirdLife Conservation Series **7**. BirdLife International, Cambridge.
Staub, J.J.F. (1973). *Oiseaux de l'Île Maurice et de Rodrigues*. Mauritius Printing Co., Port Louis, Mauritius.
Stead, E.F. (1936). A new species of *Xenicus*. *Trans. Roy. Soc. New Zealand* **66**: 312-313.
Steadman, D.W., Norton, R.L., Browning, M.R. & Arendt, W.J. (1997). The birds of St. Kitts, Lesser Antilles. *Caribb. J. Sci.* **33**: 1-20.
Steen, J.B., Krog, J.O., Toyen, O. & Bretten, S. (1989). Poikilothermy and cold tolerance in young House Martins (*Delichon urbica*). *J. Comp. Physiol. B-Biochem. Syst. Environm. Physiol.* **159**: 379-382.
Stein, R.C. (1958). The behavioral, ecological and morphological characteristics of two populations of the Alder Flycatcher, *Empidonax traillii* (Audubon). *New York State Mus. Sci. Serv. Bull.* **371**: 1-63.
Stein, R.C. (1963). Isolating mechanisms between populations of Traill's Flycatchers (*Empidonax*, Aves). *Proc. Amer. Phil. Soc.* **107(1)**: 21-50.
Steinbacher, J. (1998). Über den Leierschwanz, den Wundervogel Australiens. *Gefiederte Welt* **122(10)**: 378-379.
Steinfatt, O. (1941). Brutbeobachtungen beim Baumpieper, *Anthus t. trivialis*, in der Rominter Heide, Ostpr. [Observations of the breeding biology of the Tree Pipit, *Anthus t. trivialis*]. *J. Orn.* **89(4)**: 393-403.
Stejskal, D. & Witzeman, J.L. (1984). *Arizona Bird Committee Report, 1984*.
Stejskal, D. & Witzeman, J.L. (1985). *Arizona Bird Committee Report, 1985*.
Stepanyan, L.S. (1967). *Calandrella cheleensis* Swinhoe a valid species. *Acta Orn., Warszawa* **10**: 97-107.
Stepanyan, L.S. (1971). [Distribution of *Calandrella acutirostris* in central Asia]. *Zoologischeskii Zhurnal* **50(3)**: 447-448. In Russian with English summary.
Stepanyan, L.S. (1983). *Nadvidy i Vidy-dvoyniki v Avifaune SSSR*. Nauka, Moscow.
Stepanyan, L.S. (1990). [*Conspectus of the Ornithological Fauna of the USSR*]. Nauka, Moscow. In Russian.
Stepanyan, L.S. (1995). [*Birds of Vietnam. Based on the Investigations of 1978-1990*]. Nauka, Moscow. In Russian.
Stepanyan, L.S. & Vasilchenko, A.A. (1980). The Eastern Martin *Delichon dasypus* (Bonaparte 1850) in the fauna of the USSR. *Byull. Mosk. Obshch. Ispyt. Prir. Otd. Biol.* **87**: 32-38.
Stephan, B. (1988). Ornithologische Beobachtungen in der Mongolischen Volksrepublik (Aves). *Faun. Abh.* **15(15)**: 167-197.
Stephan, B. (1994). Ornithologische Beobachtungen in der Mongolei. [Ornithological studies in Mongolia]. *Mitt. Zool. Mus. Berlin* **70**(Suppl.): *Ann. Orn.* **18**: 53-100. In German with English summary.
Stephan, B. (1997). Zur Verstädterung der Felsenschwalbe (*Ptyonoprogne rupestris*). [About the urbanization of the Crag Martin]. *Mitt. Zool. Mus. Berlin* **73**(Suppl.): 155-161. In German with English summary.
Sternling, J. (1999). Gray Flycatcher (*Empidomax wrightii*). No. **458** in: Poole & Gill (1999).
de Steven, D. (1978). The influence of age on the breeding biology of the Tree Swallow, *Iridoprocne bicolor*. *Ibis* **120(4)**: 516-523.
de Steven, D. (1980). Clutch size, breeding success, and parental survival in the Tree Swallow (*Iridoprocne bicolor*). *Evolution* **34**: 278-279.
Stevens, L.E., Brown, B.T., Simpson, J.M. & Johnson, R.R. (1977). The importance of riparian habitat to migrating birds. Pp. 156–164 in: *Importance, Preservation, and Management of Riparian Habitat: a Symposium*. USDA Forest Service General Technical Report **RM-43**.
Stevenson, H.M. (1957). The relative magnitude of trans-Gulf and circum-Gulf spring migration. *Wilson Bull.* **69**: 39-77.
Stevenson, H.M. & Anderson, B.H. (1994). *The Birdlife of Florida*. University Press of Florida, Gainsville.
Stevenson, T. & Fanshawe, J. (2002). *Field Guide to the Birds of East Africa*. T. & A.D. Poyser, London.
Stewart, L.M. & Robertson, R.J. (1999). The role of cavity size in the evolution of clutch size in Tree Swallows. *Auk* **116(2)**: 553-556.
Stewart, R.M., Mewaldt, L.R. & Kaiser, S. (1974). Age ratios of coastal and inland fall migrant passerines in central California. *J. Field Orn.* **45**: 46–57.
Steyn, P. (1964). A note on the Chestnut-backed Finch-Lark. *Bokmakierie* **16**: 2-4.
Steyn, P. (1970). Journey for birds. *Bokmakierie* **22(4)**: 86-92.
Steyn, P. (1988). Cooperative breeding in the Spikeheeled Lark. *Ostrich* **59**: 182.
Steyn, P. (1996). *Breeding Birds of Southern Africa*. Fernwood Press, Vlaeberg, Southern Africa.
Steyn, P. & Myburgh, N. (1989). Notes on Sclater's Lark. *Birding in SA* **41(3)**: 67-69.
Steyn, P. & Myburgh, N. (1991). Further notes on Sclater's Lark. *Birding in SA* **43(3)**: 73-76.
Stickney, G.P. (1923). Correspondence. *Wilson Bull.* **25**: 125–126.
Stidolph, R.H.D. (1926). Bird-life around Wellington, N.Z. *Emu* **25**: 204-207.
Stidolph, R.H.D. (1974). Decline of Pipit in Wairarapa. *Notornis* **21(1)**: 79-80.
Stiebel, H. (1997). Habitatwahl, Habitatnutzung und Bruterfolg der Schafstelze *Motacilla flava* in einer Agrarlandschaft. *Vogelwelt* **118(5)**: 257-268.
Stiles, F.G. (1980). Evolutionary implications of habitat relations between permanent and winter resident landbirds in Costa Rica. Pp. 421-435 in: Keast & Morton (1980).
Stiles, F.G. (1981). The taxonomy of Rough-winged Swallows (*Stelgidopteryx*; Hirundinidae) in southern Central America. *Auk* **98(2)**: 282-293.
Stiles, F.G. (1983). Checklist of birds. Pp. 530-544 in: Janzen (1983).
Stiles, F.G. (1985). Conservation of forest birds in Costa Rica: problems and perspectives. Pp. 141-168 in: Diamond & Lovejoy (1985).
Stiles, F.G. (1990). Un encuentro con el Mosquerito Antioqueño, *Phylloscartes lanyoni* Graves. *Bol. Soc. Antioqueña Orn.* **1(2)**: 12-13.
Stiles, F.G. (1994). A study of fall migration of Nearctic breeding landbirds in central Costa Rica. *Bird Conserv. Int.* **4(2)**: 71–89.
Stiles, F.G. (1995). Dos nuevas subespecies de aves de la Serranía del Chiribiquete, Departamento del Caqueta, Colombia. *Lozania* **66**: 1-16.
Stiles, F.G. & Skutch, A.F. (1989). *A Guide to the Birds of Costa Rica*. Christopher Helm, London.
Stiles, F.G. & Smith, S.M. (1980). Notes on bird distribution in Costa Rica. *Brenesia* **17**: 137-156.
Stiles, F.G. & Whitney, B.M. (1983). Notes on the behavior of the Costa Rican Sharpbill (*Oxyruncus cristatus frater*). *Auk* **100(1)**: 117-125.
Stiles, F.G., Rosselli, L. & Bohórquez, C.I. (1999). New and noteworthy records of birds from the middle Magdalena Valley of Colombia. *Bull. Brit. Orn. Club* **119(2)**: 113-129.
Stipcevic, M. & Kletecki, E. (1988). The nesting of the Red-rumped Swallow, *Hirundo daurica* Temm., near Zadar. *Larus* **38-39**: 187-191.
Stipcevic, M. & Lukac, G. (1991). Survey of spreading and breeding range changes of the Red-rumped Swallow (*Hirundo daurica*) on Yugoslav territory. *Larus* **43**: 37-49.
Stipcevic, M. & Lukac, G. (1992). Breeding-range changes of Red-rumped Swallow in Yugoslavia. *British Birds* **85(1)**: 37-39.
Stirling, D. & Edwards, R.Y. (1962). Notes on the Skylark on Vancouver Island. *Can. Field-Nat.* **76**: 147-152.
Stjernstedt, R. (2003). Song data for *Anthus nyassae*. MS.
Stjernstedt, R. (2004). Song data for Afrotropical pipits. MS.
Stocek, R.F. (1970). Observations on the breeding ecology of the Tree Swallow. *Cassinia* **52**: 3-20.
Stocek, R.F. (1986). Spring weather and local movements of Tree Swallows, *Tachycineta bicolor*. *Can. Field-Nat.* **100**: 134-136.
Stoddard, H.L. (1922). Bird notes from southern Wisconsin. *Wilson Bull.* **34**: 66–79.
Stoddard, P.K. (1988). The "bugs" call of the Cliff Swallow: a rare food signal in a colonially nesting bird. *Condor* **90(3)**: 714-715.
Stoddard, P.K. & Beecher, M.D. (1983). Parental recognition of offspring in the Cliff Swallow. *Auk* **100(4)**: 795-799.
Stoepel, B. (1984). Folgen der Witterungskatastrophe 1983 in Oberschwaben auf Bestand und Alterszusammensetzung bei der Mehlschwalbe (*Delichon urbica*). *Ökol. Vögel* **6**: 159-167.
Stokes, D. & Stokes, L. (1996a). *Stokes Field Guide to Birds, Eastern Region*. Little, Brown, Boston, Massachusetts.
Stokes, D. & Stokes, L. (1996b). *Stokes Field Guide to Birds, Western Region*. Little, Brown, Boston, Massachusetts.
Stokes, D., Stokes, L. & Brown, J. (1977). *Stokes Purple Martin Book. The Complete Guide to Attracting and Housing Purple Martins*. Little, Brown, New York.
Stoleson, S.H. & Finch, D.M. (1998). Nest sites and nesting success of Southwestern Willow Flycatchers in the Gila Valley, New Mexico. Page 244 in: Anon. (1998b). (Abstract).
Stone, W. (1913). On a collection of birds obtained by the Francis E. Bond Expedition in the Orinoco Delta and Paria Peninsula, Venezuela. *Proc. Acad. Nat. Sci. Philadelphia* **65**: 189-212.
Stoner, D. (1936). Studies on the Bank Swallow, *Riparia riparia riparia* (Linnaeus) in the Oneida Lake region. *Roosevelt Wildl. Ann.* **4**: 126-233.
Stoner, D. (1941). Homing instinct in the Bank Swallow. *Bird-Banding* **12**: 104-109.
Stoner, D. (1945). Temperature and growth studies of the northern Cliff Swallow. *Auk* **62**: 207-216.
Stoner, D. & Stoner, L.C. (1941). Feeding of nestling Bank Swallows. *Auk* **58**: 52-55.
Storer, R.W. (1961). Two collections of birds from Campeche, Mexico. *Occas. Pap. Mus. Zool. Univ. Mich.* **621**: 1-20.
Storer, R.W. (1995). Cock-of-the-rock. *Birder's World* **9(2)**: 68-69.
Storr, G.M. (1965). The avifauna of Rottnest Island, western Australia III. Land birds. *Emu* **64**: 172-180.
Stotz, D.F. (1990a). The taxonomic status of *Phyllomyias reiseri*. *Bull. Brit. Orn. Club* **110**: 184-187.
Stotz, D.F. (1990b). Corrections and additions to the Brazilian avifauna. *Condor* **92(4)**: 1078-1079.
Stotz, D.F. (1992). Specific status and nomenclature of *Hemitriccus minimus* and *Hemitriccus aenigma*. *Auk* **109(4)**: 916-917.
Stotz, D.F. (1993). A hybrid manakin (*Pipra*) from Roraima, Brazil, and a phylogenetic perspective on hybridization in the Pipridae. *Wilson Bull.* **105(2)**: 348-351.
Stotz, D.F., Bierregaard, R.O., Cohn-Haft, M., Petermann, P.J., Smith, J., Whittaker, A. & Wilson, S.V. (1992). The status of North American migrants in central Amazonian Brazil. *Condor* **94(3)**: 608–621.
Stotz, D.F., Fitzpatrick, J.W., Parker, T.A. & Moskovits, D.K. (1996). *Neotropical Birds, Ecology and Conservation*. University of Chicago Press, Chicago & London.
Stotz, D.F., Lanyon, S.M., Schulenberg, T.S., Willard, D.E., Peterson, A.T. & Fitzpatrick, J.W. (1997). An avifaunal survey of two tropical forest localities in the middle Rio Jiparaná, Rondônia, Brazil. Pp. 763-781 in: Remsen (1997).
Stotz, D.F., Montambault, J.R., Pequeño, T., Valdez, A., Mack, A. & Quiroga, C. (2002). Evaluación de la avifauna de Pampas del Heath, Perú y Alto Madidi, Bolivia. Pp. 113-124 in: Montambault, J.R. ed. (2002). *Informes de las Evaluaciones Biológicas Pampas del Heath, Perú, Alto Madidi, Bolivia y Pando, Bolivia*. Rapid Assessment Program Bulletin of Biological Assessment **24**. Conservation International, Washington, D.C.

Stouffer, P.C. & Bierregaard, R.O. (1995). Use of Amazonian forest fragments by understory insectivorous birds. *Ecology* **76(8)**: 2429-2445.
Stouffer, P.C. & Chesser, R.T. (1998). Tropical Kingbird (*Tyrannus melancholicus*). No. **358** in: Poole, A.F. & Gill, F.B. eds. (1998). *The Birds of North America*. Vol. 9. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Strahm, J. (1953). Über Standort und Anlage des Nestes bei Felsenschwalben. *Orn. Beob.* **50**: 41-48.
Strahm, J. (1954). Observations sur le reproduction de l'Hirondelle de rochers. *Nos Oiseaux* **22**: 187-196.
Strahm, J. (1956). Nouvelles observations sur la reproduction des hirondelles. *Nos Oiseaux* **23**: 257-265.
Strahm, J. (1963). Notes sur le territoire de nidification chez l'Hirondelle de rochers. *Nos Oiseaux* **27**: 61-66.
Straneck, R.J. (1987). Aportes sobre el comportamiento y distribución de la Cachirla Amarillenta, *Anthus lutescens* Pucheran y la Cachirla Chaqueña, *Anthus chacoensis* Zimmer (Aves, Motacilidae). *Rev. Mus. Arg. Cienc. Nat. Bernardino Rivadavia* **14(6)**: 95-102.
Straneck, R.J. (1993). Aportes para la unificación de *Serpophaga subcristata* y *Serpophaga munda*, y la revalidación de *Serpophaga griseiceps*. (Aves: Tyrannidae). *Rev. Mus. Arg. Cienc. Nat. Bernardino Rivadavia* **16(5)**: 51-63.
Straneck, R. & Carrizo, G. (1983). *Field Check-list to the Birds of Argentina*. Literature of Latin America, Buenos Aires.
Strange, M. (2001). *A Photographic Guide to the Birds of Indonesia*. Periplus. Singapore.
Stratford, J.A. & Stouffer, P.C. (2001). Reduced feather growth rates of two common birds inhabiting central Amazonian forest fragments. *Conserv. Biol.* **15(3)**: 721-728.
Straube, F.C., Argel-de-Oliveira, M.M. & Cândido, J.F. (2000). *Ornitologia Brasileira no Século XX. Incluindo os Resumos do VIII Congresso Brasileiro de Ornitologia (Florianópolis, 9 a 14 de Julho de 2000)*. Universidade do Sul de Santa Catarina & Sociedade Brasileira de Ornitologia, Curitiba, Brazil.
Strawn, S. (1992). Green leaf collecting by Purple Martins. *Bull. Okla. Orn. Soc.* **25(1)**: 4-5.
Stremke, A. & Stremke, D. (1985). Zur Nestlingsentwicklung der Mehlschwalbe. *Falke* **32(9)**: 294-297.
Stresemann, E. (1934). *Petrochelidon nigricans nigricans* (Vieillot) als Wintergast in Papua-sien. *Orn. Monatsber.* **42**: 24-25.
Stresemann, E. (1938). *Anthus hoeschi* species nova, ein neuer Pieper aus Sudwestafrika. *Orn. Monatsber.* **46**: 149-151.
Stresemann, E. (1956). Schaubalz der Feldlerche. *J. Orn.* **4**: 97.
Stresemann, E. & Stresemann, V. (1968). Im Sommer mausernde Populationen der Rauchschwalbe. *Hirundo rustica*. *J. Orn.* **109**: 475-484.
Stresemann, E. & Stresemann, V. (1969). Die Mauser von *Ptyonoprogne rupestris* and *Delichon nipalensis*. *J. Orn.* **110**: 39-52.
Strewe, R. (2000a). ¿La Viudita Colirrufa (*Knipolegus poecilurus*) realiza migraciones altitudinales o longitudinales? *Bol. Soc. Antioqueña Orn.* **11(20-21)**: 43-45.
Strewe, R. (2000b). Las aves y la importancia de la conservación de la Reserva Natural El Pangán, Nariño, en el suroeste de Colombia. *Bol. Soc. Antioqueña Orn.* **11**: 56-65.
Strewe, R. (2001). Notes on nests and breeding activity of fourteen bird species from southwestern Colombia. *Orn. Neotropical* **12**: 265-269.
Strewe, R. & Navarro, C. (2003). New distributional records and conservation importance of the San Salvador Valley, Sierra Nevada de Santa Marta, northern Colombia. *Orn. Colombiana* **1**: 29-41.
Strewe, R. & Navarro, C. (2004). New and noteworthy records of birds from the Sierra Nevada de Santa Marta region, north-eastern Colombia. *Bull. Brit. Orn. Club* **124(1)**: 38-51.
Strewe, R. & Renjifo, L.M. (2002). *Cephalopterus penduliger*. Pp. 360-363 in: Renjifo *et al.* (2002).
Strijbos, J.P. (1981). [Crested Lark breeding in a flat roof]. *Vogeljaar* **29(5)**: 263.
Stronach, B.W.H. (1967). An unusual record of the Golden Pipit *Tmetothylacus tenellus* (Cabanis). *Bull. Brit. Orn. Club* **87(8)**: 164-165.
Stronach, N. (1990a). New information on birds in Serengeti National Park, Tanzania. *Bull. Brit. Orn. Club* **110(4)**: 198-202.
Stronach, N. (1990b). The occurrence of the Grass Owl *Tyto capensis* and Richard's Pipit *Anthus novaeseelandiae* in the lowlands of New Guinea. *Bull. Brit. Orn. Club* **110(4)**: 181-184.
Strong, T.R. & Bock, C.E. (1990). Bird species distribution patterns in riparian habitats in southeastern Arizona. *Condor* **92(4)**: 866-885.
Stuart, S.N. (1986). *Conservation of Cameroon Mountain Forest*. ICBP, Cambridge.
Stuart, T. (2003). Neotropical News. Brazil. A new site for the Alagoas endemics. *Cotinga* **20**: 13.
Stuart Baker, E.C. (1926). *Fauna of British India. Birds*. Vol. 3. 2nd edition. Taylor & Francis, London.
Stuart Baker, E.C. (1934). *The Nidification of Birds of the Indian Empire*. Vol. 3. Taylor & Francis, London.
Stuart Baker, E.C. (1935). *The Nidification of Birds of the Indian Empire*. Vol. 4. Taylor & Francis, London.
Stuart Baker, E.C. (1942). *Cuckoo Problems*. H.F. & G. Witherby, London.
Stupka, A. (1963). *Notes on the Birds of Great Smoky Mountains National Park*. University of Tennessee Press, Knoxville, Tennessee.
Stutchbury, B.J. (1988). Evidence that Bank Swallow colonies do not function as information centers. *Condor* **90**: 953-955.
Stutchbury, B.J. (1991a). The adaptive significance of male subadult plumage in Purple Martins: plumage dyeing experiments. *Behav. Ecol. Sociobiol.* **29(4)**: 297-306.
Stutchbury, B.J. (1991b). Floater behaviour and territory acquisition in male Purple Martins. *Anim. Behav.* **42(3)**: 435-443.
Stutchbury, B.J. (1991c). Coloniality and breeding biology of Purple Martins (*Progne subis hesperia*) in saguaro cacti. *Condor* **93(3)**: 666-675.
Stutchbury, B.J. (1992). Experimental evidence that bright coloration is not important for territory defense in Purple Martins. *Behav. Ecol. Sociobiol.* **31(1)**: 27-33.
Stutchbury, B.J. & Robertson, R.J. (1985). Floating populations of female Tree Swallows. *Auk* **102**: 651-654.
Stutchbury, B.J. & Robertson, R.J. (1987a). Signalling subordinate and female status: two hypotheses for the adaptive significance of subadult plumage in female Tree Swallows. *Auk* **104**: 717-723.
Stutchbury, B.J. & Robertson, R.J. (1987b). Behavioral tactics of subadult female floaters in the Tree Swallow. *Behav. Ecol. Sociobiol.* **20**: 413-419.
Stutchbury, B.J. & Robertson, R.J. (1987c). Two methods of sexing adult Tree Swallows before they begin breeding. *J. Field Orn.* **58**: 236-242.
Stutchbury, B.J. & Robertson, R.J. (1987d). Do nest building and first egg dates reflect settlement patterns of females? *Condor* **89**: 587-593.
Stutchbury, B.J. & Robertson, R.J. (1988). Within-season and age-related patterns of reproductive performance in female Tree Swallows (*Tachycineta bicolor*). *Can. J. Zool.* **66**: 827-834.
Stutchbury, B.J. & Robertson, R.J. (1990). Do Tree Swallows use nest cavities as overnight roosts during territory establishment? *J. Field Orn.* **61**: 26-33.
Stutchbury, B.J. & Rohwer, S. (1990). Molt patterns in the Tree Swallow (*Tachycineta bicolor*). *Can. J. Zool.* **68**: 1468-1472.
Stutterheim, C.J. (1978). Striped Pipit feeding on engorged tick. *Witwatersrand Bird Club News* **100**: 15.
Suárez, F. (1994). Tawny Pipit *Anthus campestris*. Pp. 372-373 in: Tucker & Heath (1994).
Suárez, F. & Garza, V. (1989). La invernada de la Alondra de Dupont, *Chersophilus duponti*, en la Península Ibérica. *Ardeola* **36(1)**: 107-110.
Suárez, F. & Manrique, J. (1992). Low breeding success in Mediterranean shrubsteppe passerines: Thekla Lark *Galerida theklae*, Lesser Short-toed Lark *Calandrella rufescens*, and Black-eared Wheatear *Oenanthe hispanica*. *Ornis Scand.* **23(1)**: 24-28.
Suárez, F. & Oñate, J. (1994). Dupont's Lark *Chersophilus duponti*. Pp. 350-351 in: Tucker & Heath (1994).
Suárez, F., Fernández, A. & de Lope, M.J. (1989). Note sur les effets de l'aridité sur la structure et la composition des communautés de Passeriformes des hauts-plateaux à alpha (*Stipa tenacissima*) au Maroc. *Bull. Inst. Sci., Rabat.*
Suárez, F., Garza, V., Herranz, J., Ramírez, A., Oñate, J.J., Traba, J. & Morales, M.B. (2003). La primavera silenciosa de las alondras ibéricas: problemas de conservación de un grupo de aves poco estudiado. *Quercus* **205**: 16-21.
Suárez, F., Garza, V. & Morales, M.B. (2002). Habitat use of two sibling species, the Short-toed *Calandrella brachydactyla* and the Lesser Short-toed *C. rufescens* Larks, in mainland Spain. *Ardeola* **49(2)**: 259-272.
Suárez, F., Garza, V. & Morales, M.B. (2003). The role of extensive cereal crops, dry pasture and shrub-steppe in determining Skylark *Alauda arvensis* densities in the Iberian Peninsula. *Agric. Ecosyst. & Environm.* **95**: 1-7.
Suárez, F., Manrique, J. & Yanes, M. (1991). Mortalidad en nidos de aves esteparias: influencia en los ciclos reproductivos y poblacionales. *Stud. Oecol.* **8**: 241-248.
Suárez, F., Santos, T. & Tellería, J.L. (1982). The status of Dupont's Lark *Chersophilus duponti*, in the Iberian Peninsula. *Gerfaut* **72**: 231-235.
Suárez, F., Yanes, M., Herranz, J. & Manrique, J. (1993). Nature reserves and the conservation of Iberian shrubsteppe passerines: the paradox of nest predation. *Biol. Conserv.* **64(1)**: 77-81.
Suárez, W. (1998). Nueva localidad para la distribución del Pitirre Real *Tyrannus cubensis* (Aves: Tyrannidae) en Cuba. *Pitirre* **11(1)**: 11.
Südbeck, P. (1981). Zunahme des Bestandes der Heidelerche (*Lullula urborea*) bei Cloppenburg. *Jahresber. Orn. Arbeitsgem. Oldenb.* **4**: 53-55.
Sudhaus, W. (1966). Zur Nahrung der Haubenlerche (*Galerida cristata*). *Orn. Mitt* **18**: 131-134.
Suertegaray, C. (1997). Description of the nest and eggs of the Black-and-white Monjita *Heteroxolmis dominicana*. *Cotinga*: **8**: 79-81.
Sugathan, R. & Varghese, A.P. (1996). A review of the birds of Thattakad Bird Sanctuary, Kerala. *J. Bombay Nat. Hist. Soc.* **93**: 487-506.
Sujatnika, Jepson, P., Soehartono, T.R., Crosby, M.J. & Mardiastuti, A. (1995). *Melestarikan Keanekaragaman Hayati Indonesia: Pendekatan Duerah Burung Endemik. Conserving Indonesian Biodiversity: the Endemic Bird Area Approach*. PHPA/BirdLife International, Jakarta, Indonesia. In Indonesian and English.
Sultana, J. (1991). Some observation notes on the Short-toed Lark *Calandrella brachydactyla*. *Il Merill* **27**: 23.
Sultana, J. & Gauci, C. (1982). *A New Guide to the Birds of Malta*. Malta Ornithological Society, Valletta. 207 pp.
Summers, G. (1974). Swallow persistently mobbing Tawny Pipit. *British Birds* **67**: 355.
Surmacki, A., Lorek, G. & Tryjanowski, P. (1999). Communal roosting of Linnets (*Carduelis cannabina*) and Blue-headed Wagtails (*Motacilla flava*) at post-breeding period in western Poland. *Vogelwarte* **40**: 146-148.
Sutter, G.C. (1997). Nest-site selection and nest-entrance orientation in Sprague's Pipit. *Wilson Bull.* **109(3)**: 462-469.
Sutter, G.C., Davis, S.K., Duncan, D.C. & David, C. (2000). Grassland songbird abundance along roads and trails in southern Saskatchewan. *J. Field Orn.* **71(1)**: 110-116.
Sutter, G.C., Sawatrky, D.J., Cooper, D.M. & Brigham, R.M. (1996). Renesting intervals in Sprague's Pipit, *Anthus spragueii*. *Can. Field-Nat.* **110(4)**: 694-697.
Sutton, G.M. (1927). Flocking, mating and nest-building of the Prairie Horned Lark. *Wilson Bull.* **34**: 131-141.
Sutton, G.M. (1967). *Oklahoma Birds*. University of Oklahoma Press, Norman, Oklahoma.
Sutton, G.M. (1951). *Mexican Birds: First Impressions*. University of Oklahoma Press, Norman, Oklahoma.
Sutton, G.M. & Parmelee, D.F. (1954). Survival problems of the Water Pipit in Baffin Island. *Arctic* **7**: 81-92.
Sutton, G.M. & Parmelee, D.F. (1955). Nesting of the Horned Lark on Baffin Island. *Bird-Banding* **26**: 1-18.
Sutton, R. (1973). Golden Swallow. In bird notes. *Gosse Bird Club Broadsheet* **21**: 21.
Svensson, L. (1977). Problemet att skilja ung Citronarla *Motacilla citreola* fran andra arlearter. [The problem of separating the young Citrine Wagtail *Motacilla citreola* from other species of wagtails]. *Vår Fågelvärld* **36(1)**: 48-52. In Swedish with English summary.
Svensson, L. (1992). *Identification Guide to European Passerines*. 4th edition. Published privately, Stockholm.
Svensson, L., Grant, P.J., Mullarney, K. & Zetterström, D. (1999). *Collins Bird Guide*. Harper Collins, London.
Svensson, S. (1986). Number of pairs, timing of egg-laying and clutch size in a subalpine Sand Martin *Riparia riparia* colony, 1968-1985. *Ornis Scand.* **17**: 221-229.
Svensson, S. (1990). An alarming decline of the Shore Lark *Eremophila alpestris* in Sweden. Pp. 5-11 in: *Proceedings of the VI Nordic Congress of Ornithology, 1987*.
Svensson, S. (1997). The wintering area of Shorelarks *Eremophila alpestris* breeding in Swedish Lapland. *Ornis Svecica* **7(3-4)**: 169-173.
Svensson, S. & Berglund, O. (1995). Monitoring of small and endangered populations, with special regard to the Shore Lark *Eremophila alpestris*. Pp. 153-162 in: Hagemeijer, E.J.M. & Verstrael, T.J. eds. (1995). *Bird Numbers 1992. Distribution, Monitoring and Ecological Aspects*. SOVON, Beek-Ubbergen, Netherlands.
Svensson, S., Berglund, O., Tisell, J., Bodenmalm, A., Erlandsson, A., Haligren, M., Jonsson, T. & Nilsson, P. (1992). Reproductive success of the Shore Lark *Eremophila alpestris* in southern Lapland. *Ornis Svecica* **2(1)**: 37-40.
Swain, S.D. (1989). *The Use of Endogenous Energy Reserves by Brood-rearing Horned Larks* (Eremophila alpestris)*: Energetics, Substrate Metabolism, and Flight Muscle Degradation*. PhD dissertation, University of Wyoming, Laramie, Wyoming.
Swain, S.D. (1991). Metabolism and energy reserves of brood-rearing Horned Larks (*Eremophila alpestris*). *Comp. Biochem. Physiol.* **99(1-2)A**: 69-73.
Swain, S.D. (1992a). Energy substrate profiles during fasting in Horned Larks (*Eremophila alpestris*). *Physiol. Zool.* **65(3)**: 568-582.
Swain, S.D. (1992b). Flight muscle catabolism during overnight fasting in a passerine bird, *Eremophila alpestris*. *J. Comp. Physiol. B Biochem. Syst. Environm. Physiol.* **162(4)**: 383-392.
de Swardt, D.H. (1988). Unusual mortalities of South African Cliff Swallow. *Mirafra* **5(4)**: 84.
de Swardt, D.H. (1990a). A partial albino Buffy Pipit. *Mirafra* **7(3)**: 69-70.
de Swardt, D.H. (1990b). Spikeheeled Lark breeding at Soetdoring Nature Reserve. *Mirafra* **7(4)**: 107-108.
de Swardt, D.H. (1996). Notes on the breeding of Greybacked Finchlark *Eremopterix verticalis*. *Mirafra* **13(1)**: 10-11.
de Swardt, D.H. (2001) Nestlings and nestling period of the Longbilled Pipit *Anthus similis*. *Bird Numbers* **10(1)**: 36.
de Swardt, D.H. (2002). Notes on the breeding biology of the Rock Pipit, *Anthus crenatus*. *Ostrich* **73(3&4)**: 170-171.
Swarth, H.S. (1904). Birds of the Huachuca Mountains, Arizona. *Pacific Coast Avifauna* **4**: 1-70.
Swarth, H.S. (1929). *The Faunal Areas of Southern Arizona: a Study of Animal Distributions*. Proceedings of the California Academy of Science **18**, San Francisco. 116 pp.
Swarth, H.S. (1931). *The Avifauna of the Galapagos Islands*. Occasional Paper of the California Academy of Science **18**, San Francisco. 299 pp.
Swash, A. & Still, R. (2000). *Birds, Mammals & Reptiles of the Galápagos Islands. An Identification Guide*. Pica Press & WILDGuides, Nr. Robertsbridge & Hampshire, UK.
Swynnerton, C.F.M. (1911). On some nests and eggs from Mount Chirinda, southern Rhodesia. *J. South Afr. Orn. Union (Ser. 2)* **7(1)**: 1-20.
Sydow, W. (1979). *Anthus hoeschi* species nova, ein neuer Pieper aus Sudwestafrika. *Mitt. Orn. Arbeitsgr. SWA Wiss. Ges.* **14**: 1.
Symens, P. & Suhaibani, A. (1993). Short-toed and Bimaculated Larks breed on Karan Island, Arabian Gulf. *Phoenix* **10**: 15.
Syms, M. (1978). Welcome Swallow in mid Tasman Sea. *Notornis* **25(3)**: 212.
Syvertsen, P.O. & Dellelegn, Y. (1991). The status of some bird species endemic to south Ethiopia. *Scopus* **15**: 30-34.
Szenek, Z. (1986). [*Melanocorypha calandra* occurring in Kiskunsag]. *Aquila* **92**: 293-294.
Szép, T. (1990). Estimation of abundance and survival rate from capture-recapture data of Sand Martin (*Riparia riparia*) ringing. *Ring* **13**: 205-214.
Szép, T. (1991a). Study of foraging synchrony in the Sand Martin (*Riparia riparia*) colony. *Proc. Sci. Mtg. Hung. Orn. Nat. Conserv. Soc.* **3**: 49-68.
Szép, T. (1991b). Number and distribution of the Hungarian Sand Martin (*Riparia riparia* L., 1758) population breeding along the Hungarian reaches of the river Tisza. *Aquila* **98**: 111-124.
Szép, T. (1991c). Monitoring of abundance and survival rates of Sand Martin (*Riparia riparia*) population in the upper reaches of the river Tisza, 1986-1990. *Ornis Hungarica* **1**: 37-44.
Szép, T. (1992). Nine years old Sand Martin (*Riparia riparia*) recovery in eastern Hungary. *Aquila* **99**: 176-189.
Szép, T. (1993). Changes of the Sand Martin (*Riparia riparia*) population in eastern Hungary: the role of adult survival and migration between colonies in 1986-1993. *Ornis Hungarica* **3**: 56-66.
Szép, T. (1995a). Relationship between West African rainfall and the survival of central European Sand Martins *Riparia riparia*. *Ibis* **137(2)**: 162-168.
Szép, T. (1995b). Survival rates of Hungarian Sand Martins and their relationship with Sahel rainfall. *J. Appl. Stat.* **22**: 891-904.
Szép, T. (1999a). Effects of age- and sex-biased dispersal on the estimation of survival rates of the Sand Martin *Riparia riparia* population in Hungary. *Bird Study* **46**: 169-177.
Szép, T. (1999b). Monitoring of the Sand Martin (*Riparia riparia*), chances of forecasting a severe population decline. *Vogelwelt* **120**: 349-353.
Szép, T. & Barta, Z. (1992). The threat to Bank Swallows from the Hobby at a large colony. *Condor* **94**: 1022-1025.
Szép, T. & Møller, A.P. (1999). Cost of parasitism and host immune defence in the Sand Martin *Riparia riparia*: a role for parent-offspring conflict? *Oecologia* **119**: 9-15.
Szép, T. & Møller, A.P. (2000). Exposure to ectoparasites increases within brood-variability in size and body mass in the Sand Martin. *Oecologia* **125**: 201-207.
Szép, T., Barta, Z., Tóth, Z. & Sóvári, Z. (1995). Use of an electronic balance with Bank Swallow nests: a new field technique. *J. Field Orn.* **66**: 1-11.
Szép, T., Szabó, D.Z. & Vallner, J. (2003). Integrated population monitoring of Sand Martin *Riparia riparia* - an opportunity to monitor the effects of environmental disasters along the river Tisza. *Ornis Hungarica* **12-13**: 169-182.
Taapken, J. (1982). [The dreadful slaughter of larks in France]. *Vogeljaar* **30(4)**: 182-188.

Taczanowski, L. (1883). Description des espèces nouvelles de la collection péruvienne de M. le Dr. Raimondi de Lima. *Proc. Zool. Soc. London* **1883**: 70-72.
Taczanowski, L. (1884). *Ornithologie du Pérou*. Volume 2. Typographie Oberthur, Rennes.
Tae, D.E. (2002). Distribution and biology of Siberian Buff-bellied Pipit. *Dutch Birding* **24(3)**: 151-156.
Tait, C.C. (1991). Incubation and nestling period of the Grassveld Pipit. *Ostrich* **62(1&2)**: 76.
Tanner, Z. (2000). *Ecological Impacts of the Superb Lyrebird in Tasmania*. BSc thesis, University of Tasmania, Hobart, Australia.
Tarboton, W.R. (1980). Avian populations in Transvaal savanna. Pp. 113-124 in: Johnson, D.N. (1980).
Tarboton, W.R. (1994). The Blue Swallow: still so precarious. Pp. 41-44 in: Cadell, E. & Ledger, J. eds. (1994). *Vision of Wildlife, Ecoturism and the Environment in Southern Africa*. Endangered Wildlife Trust, Johannesburg.
Tarboton, W.R. (1997). Grasslands: the way forward. *Africa. Birds & Birding* **2(3)**: 41-44.
Tarboton, W.R. (2001). *A Guide to the Nests and Eggs of Southern African Birds*. Struik Publishers Ltd, Cape Town.
Tarboton, W.R., Kemp, M.I. & Kemp, A.C. (1987). *Birds of the Transvaal*. Transvaal Museum, Pretoria.
Tarburton, M.K. (1986). A comparison of the flight behaviour of the White-rumped Swiftlet and the Welcome Swallow. *Bird Behaviour* **6(2)**: 72-84.
Tarburton, M.K. (1991). Breeding biology of Fairy Martins at Murwillumbah. *Emu* **91(2)**: 93-99.
Tarburton, M.K. (1993). A comparison of the breeding biology of the Welcome Swallow in Australia and recently colonized New Zealand. *Emu* **93(1)**: 34-43.
Tarof, S.A. & Ratcliffe, L.M. (2000). Pair formation and copulation behavior in Least Flycatcher clusters. *Condor* **102(4)**: 832-837.
Tate, J. & Weaver, D.K. (1966). Nest analysis of the Tree Swallow. *Jack-Pine Warbler* **44**: 15-22.
Tatin, L. (1997). Nidification de la Bergeronnette grise *Motacilla alba alba* en Camargue. [Reproduction of White Wagtail *Motacilla alba alba* in the Camargue]. *Alauda* **65(4)**: 377-378.
Taylor, D.M. (1994). Seasonal status of the American Pipit in Idaho. *Western Birds* **25(1)**: 43-49.
Taylor, I. (1986). The song of the Superb Lyrebird in the Australian Capital Territory. *Corella* **10(2)**: 46-54.
Taylor, I.R. & Macdonald, M.A. (1979). A population of *Anthus similis* on the Togo range in eastern Ghana. *Bull. Brit. Orn. Club* **99(1)**: 29-30.
Taylor, J.S. (1942). Notes on the martins, swallows and swifts: Graal-Reinet. *Ostrich* **13**: 148-156.
Taylor, M. (2002). Rock Pipit *Anthus petrosus*. Pp. 474-476 in: Wernham *et al.* (2002).
Taylor, M.J. (1992). First record of Temminck's Horned Lark *Eremophila bilopha* in Yemen. *Sandgrouse* **14(2)**: 109.
Taylor, P.B. (1978). A melanistic Pied Wagtail (*Motacilla aguimp*) at Ndola. *Bull. Zambian Orn. Soc.* **10**: 43.
Taylor, P.B. (1979a). *Palearctic and Intra-African Migrant Birds in Zambia: a Report for the Period May 1971 to December 1976*. Zambian Ornithological Society Occasional Paper **1**. 169 pp.
Taylor, P.B. (1979b). Red-throated Pipit *Anthus cervinus* at Ndola, Zambia. *Scopus* **3(3)**: 80.
Taylor, P.B. (1980). Further occurrences of Red-throated Pipits *Anthus cervinus* at Ndola, Zambia. *Scopus* **4(3)**: 72.
Taylor, P.B. (1982). House Martins *Delichon urbica* associating with a breeding colony of Red-throated Cliff Swallows *Hirundo rufigula* in Zambia *Scopus* **6**: 43-45.
Taylor, P.B. (1983). East African Bird Report 1981: E.A.N.H.S. Nest Record Scheme: 1981. *Scopus* **5(5)**: 154-164.
Taylor, P.B. (1983). Pearl-breasted Swallow *Hirundo dimidiata* in southwestern Tanzania and northeastern Zambia. *Scopus* **7(3/4)**: 94.
Taylor, W.K. & Hanson, H. (1970). Observations on the breeding biology of the Vermilion Flycatcher in Arizona. *Condor* **82**: 315–319.
Taylor, W.K. & Kershner, M.A. (1991). Breeding biology of the Great Crested Flycatcher in central Florida. *J. Field Orn.* **62**: 28-39.
Taylor, W.P. (1946). Scissor-tailed Flycatcher and Red-tailed Hawk nest in the same tree. *Condor* **48(3)**: 94.
Teather, K. (1996). Patterns of growth and asymmetry in nestling Tree Swallows. *J. Avian Biol.* **27**: 302-310.
Tebb, G. & Ranner, A. (2002). New significant bird records from Buryatia, Russia. *Forktail* **18**: 101-105.
Teixeira, D.M. (1987). A new tyrannulet (*Phylloscartes*) from northeastern Brazil. *Bull. Brit. Orn. Club* **107(1)**: 37-41.
Teixeira, D.M. & de Almeida, A.C.C. (1996a). Sobre a alimentação de *Xipholena atropurpurea* (Wied, 1820) (Aves, Cotingidae) no nordeste do Brasil. Page 118 in: Anon. (1996e).
Teixeira, D.M. & de Almeida, A.C.C. (1996b). Sobre a abundância de *Xipholena atropurpurea* (Wied, 1820) (Aves, Cotingidae) no sul da Bahia. Page 119 in: Anon. (1996e). (Abstract).
Teixeira, D.M. & de Almeida, A.C.C. (1997). *A Biologia da "Escarradeira"*. Xipholena atropurpurea *(Wied, 1820) (Aves, Cotingidae)*. Publicación Técnico-Científica **2**, Veracruz Florestal, Eunápolis, Brazil.
Teixeira, D.M. & Luigi, C. (1990). Notas sobre a biologia de *Xipholena atropurpurea* no nordeste do Brasil. Page 174 in: *XVII Congresso Brasileiro de Zoologia, Londrina*. (Abstract).
Teixeira, D.M., Luigi, C. & de Almeida, A.C.C. (1990). A redescoberta de *Iodopleura pipra leucopygia* no nordeste do Brasil. Page 179 in: *XVII Congresso Brasileiro de Zoologia, Londrina*. (Abstract).
Teixeira, D.M., Nacinovic, J.B. & Luigi, G. (1988). Notes on some birds of northeastern Brazil. Part 3. *Bull. Brit. Orn. Club* **108(2)**: 75-79.
Teixeira, D.M., Nacinovic, J.B. & Luigi, G. (1989). Notes on some birds of northeastern Brazil. Part 4. *Bull. Brit. Orn. Club* **109(3)**: 152-157.
Teixeira, D.M., Nacinovic, J.B. & Schloemp, I.M. (1991). Notas sobre alguns Passeriformes brasileiros pouco conhecidos. [Notes on some little-known Brazilian passerines]. *Ararajuba* **2**: 97-100. In Portuguese with English summary.
Teixeira, D.M., Otoch, R., Luigi, G., Raposo, M.A. & de Almeida, A.C.C. (1993). Notes on some birds of northeastern Brazil. Part 5. *Bull. Brit. Orn. Club* **113(1)**: 48-52.
Tellería, J.L. (1981). *La Migración de las Aves en el Estrecho de Gibraltar*. Vol. 2. Aves no planeadoras. Universidad Complutense, Madrid.
Tellería, J.L., Asensio, B. & Díaz, M. (1999). *Aves Ibéricas*. Vol 2. Paseriformes. J.M. Reyero Editor, Madrid.
Tellería, J.L., Suárez, F. & Santos, T. (1988). Bird communities of the Iberian shrubsteppes: seasonality and structure along a climatic gradient. *Holarctic Ecol.* **11**: 171-177.
Tellini, G. (1987). Nidificazione di Calandrella, *Calandrella brachydactyla*, a 1300 m nell'Appennino Centrale. *Riv. Ital. Orn.* **57(3-4)**: 270-271.
Tello, J.G. (2001). Lekking behavior of the Round-tailed Manakin. *Condor* **103(2)**: 298-321.
Temple, S.A. (2002). Extinction-prone birds of Trinidad and Tobago: making predictions from theory. Pp. 180-193 in: Hayes & Temple (2002).
Tenney, C.R. (2000). Northern Beardless Tyrannulet (*Camptostoma imberbe*). No. **519** in: Poole & Gill (2000a).
Ter Haar, G.J. (1981). Dunn's Lark in Israel in April 1980. *Dutch Birding* **3(1)**: 19-20.
Terblanche, S. (1997). Gestreepte Koester in plantasie. *Laniarius* **67**: 17.
Terborgh, J. (1971). Distribution on environmental gradients: theory and a preliminary interpretation of distribution patterns in the avifauna of the Cordillera Vilcabamba, Peru. *Ecology* **52**: 23-40.
Terborgh, J. & Weske, J.S. (1975). The role of competition in the distribution of Andean birds. *Ecology* **56(3)**: 562-576.
Terborgh, J., Fitzpatrick, J.W. & Emmons, L. (1984). Annotated checklist of bird and mammal species of Cocha Cashu Biological Station, Manu National Park, Peru. *Fieldiana Zool. (New Ser.)* **21**: 1-29.
Terborgh, J., Robinson, S.K., Parker, T.A., Munn, C.A. & Pierpont, N. (1990). Structure and organization of an Amazonian forest bird community. *Ecol. Monogr.* **60(2)**: 213-238.
Terres, J.K. (1980). *The Audubon Society Encyclopedia of North American Birds*. Alfred A. Knopf, New York.
Terres, J.K. (1982). *The Audubon Society Encyclopedia of North American Birds*. Alfred A. Knopf, New York.
Théry, M. (1990a). Display repertoire and social organization of the White-fronted and White-throated Manakins. *Wilson Bull.* **102(1)**: 123-130.
Théry, M. (1990b). Influence de la lumière sur le choix de l'habitat et le comportement sexuel des Pipridae (Aves: Passeriformes) en Guyane française. *Rev. Ecol.* **45**: 215-236.
Théry, M. (1990c). *Écologie et Comportement des Oiseaux Pipridae en Guyane: Leks, Frugivorie et Dissémination des Graines*. PhD thesis, Université de Paris, Paris..
Théry, M. (1992). The evolution of leks through female choice: differential clustering and space utilization in six sympatric manakins. *Behav. Ecol. Sociobiol.* **30(3-4)**: 227-237.
Théry, M. (1997). Wing-shape variation in relation to ecology and sexual selection in five sympatric lekking manakins (Passeriformes: Pipridae). *Ecotropica* **3(1)**: 9-19.
Théry, M. & Larpin, D. (1993). Seed dispersal and vegetation dynamics at a Cock-of-the-rock lek in the tropical forest of French Guiana. *J. Trop. Ecol.* **9**: 109-116.
Théry, M. & Vehrencamp, S.L. (1995). Light patterns as cues for mate choice in the lekking White-throated Manakin (*Corapipo gutturalis*). *Auk* **112(1)**: 133-145.
Thévenot, M., Vernon, R. & Bergier, P. (2003). *The Birds of Morocco. An Annotated Check-list*. BOU Check-list **20**. British Ornithologists' Union, Tring, UK.
Thibault, J.C. (1983). *Les Oiseaux de la Corse*. Parc Naturel Régional de la Corse, Ajaccio, France.
Thibault, J.C. (1988). Menaces et conservation des oiseaux de Polynésie Française. Pp. 87-124 in: Thibault & Guyot (1988).
Thibault, J.C. & Guyot, I. eds. (1988). *Livre Rouge des Oiseaux Menacés des Régions Françaises d'Outre-Mer*. ICBP Monograph **5**. Saint-Claude, France. In French with English summary.
Thibault, J.C. & Rives, C. (1988). *Oiseaux de Tahiti*. Delachaux & Niestlé, Neuchâtel & Paris.
Thiede, W. (1989). Federohren der Ohrenlerche (*Eremophila alpestris*) als Feldmerkmal? *Orn. Mitt.* **41(5)**: 93-94.
Thiollay, J.M. (1985). The birds of Ivory Coast: status and distribution. *Malimbus* **7(1)**: 1-59.
Thiollay, J.M. (1988). Les oiseaux menacés de Guyane. Pp. 61-80 in: Thibault & Guyot (1988)..
Thiollay, J.M. (1992). Influence of selective logging on bird species diversity in a Guianan rain forest. *Conserv. Biol.* **6(1)**: 47-63.
Thiollay, J.M. (1994). Structure, density, and rarity in an Amazonian rainforest bird community. *J. Trop. Ecol.* **10(4)**: 449-481.
Thiollay, J.M. & Jullien, M. (1998). Flocking behaviour of foraging birds in a Neotropical rain forest and the antipredator defence hypothesis. *Ibis* **140(3)**: 382-394.
Thomas, B.T. (1979a). The birds of a ranch in the Venezuelan llanos. Pp. 213-232 in: Eisenberg, J.F. ed. (1979). *Vertebrate Ecology in the Northern Neotropics*. Smithsonian Institution Press, Washington, D.C.
Thomas, B.T. (1979b). Behavior and breeding biology of the White-bearded Flycatcher (*Conopias inornata*). *Auk* **96**: 767-775.
Thomas, B.T. (1982). Weights of some Venezuelan birds. *Bull. Brit. Orn. Club* **102**: 48-52.
Thomas, D.G. (1966). Observations on the arrival of the Welcome Swallows and Tree-martins in the Hobart area, spring 1964-95. *Emu* **66**: 33-38.
Thomas, K. & Shutler, D. (2001). Ectoparasites, nestling growth, parental feeding rates, and begging intensity of Tree Swallows. *Can. J. Zool.* **79**: 346-353.
Thompson, D.W. (1936). *A Glossary of Greek Birds*. Oxford University Press, London.
Thompson, E.T. (1891). *The Birds of Manitoba*. Proceedings of the US National Museum **13**. Smithsonian Institution, Washington, D.C. 557 pp.
Thompson, H.M., Tarrant, K.A. & Hart, A.D.M. (1992). Exposure of starlings, House Sparrows and Skylarks to pesticides. Pp. 194-199 in: Grieg-Smith, P., Frampton, G. & Hardy, T. eds. (1992). *Pesticides, Cereal Farming and the Environment: the Boxworth Project*. HMSO, London.
Thompson, M.C. & Ely, C. (1989). *Birds in Kansas*. Vol. 1. University of Kansas Museum of Natural History, Lawrence, Kansas.
Thompson, M.C. & Ely, C. (1992). *Birds in Kansas*. Vol. 2. University of Kansas Museum of Natural History, Lawrence, Kansas.
Thompson, M.L.P. (1992). *Reproductive Success and Survival of Swallows (*Hirundo rustica*): Effects of Age and Breeding Condition*. PhD thesis, University of Stirling, Stirling, UK.
Thompson, P.M., Harvey, W.G., Johnson, D.L., Millin, D.J., Rashid, S.M.A., Scott, D.A., Stanford, C. & Woolner, J.D. (1993). Recent notable bird records from Bangladesh. *Forktail* **9**: 13-44.
Thomsen, P. & Jacobsen, P. (1979). *The Birds of Tunisia*. Nature-Travels, Copenhagen.
Thomson, L. (1955). *Acta XI Congressus Internationalis Ornithologici, Basel, 1954*. Birkhäuser Verlag, Basel.
Thomson, W.R. (1983). On the Monotonous or White-tailed Bush Lark in Zimbabwe. *Honeyguide* **113**: 21-22.
Thönen, W. (1999). Der Ruf des Pazifikpiepers *Anthus rubescens* als Bestimmungsmerkmal. [The call of the Buff-bellied Pipit *Anthus rubescens* as a field mark]. *Limicola* **13(1)**: 30-35.
Thonglongya, K. (1968). A new martin of the genus *Pseudochelidon* from Thailand. *Thai Natl. Sci. Pap., Fauna Ser.* **1**: 1-10.
Thonglongya, K. (1969). *Report on an Expedition in Northern Thailand to Look for Breeding Sites of* Pseudochelidon sirintarae *(21 May to 27 June 1969)*. Applied Scientific Research Corporation, Bangkok, Thailand.
Thorburn, L. (1979). *Vocal Mimicry in the Superb Lyrebird* Menura novachollandiae *(Latham)*. BSc thesis, University of Sydney, Sydney.
Thoresen, A.C. (1974). First Shrike-like Cotinga record for Peru. *Auk* **91(4)**: 840.
Thurber, W.A., Serrano, J.F., Sermeño, A. & Benítez, M. (1987). *Status of Uncommon and Previously Unreported Birds of El Salvador*. Proceedings of the Western Foundation of Vertebrate Zoology **3(3)**. 184 pp.
Tieleman, B.I. (2002). *Avian Adaptation along an Aridity Gradient. Physiology, Behavior, and Life History*. PhD thesis, Rijksuniversiteit Groningen, Groningen, Netherlands.
Tieleman, B.I. & Williams, J.B. (2002a). Cutaneous and respiratory water loss in larks from arid and mesic environments. *Physiol. Biochem. Zool.* **75(6)**: 590-599.
Tieleman, B.I. & Williams, J.B. (2002b). Effects of food supplementation on behavioural decisions of Hoopoe-larks in the Arabian Desert: balancing water, energy and thermoregulation. *Anim. Behav.* **63**: 519-529.
Tieleman, B.I., Williams, J.B. & Bloomer, P. (2002). Adaptation of metabolism and evaporative water loss along an aridity gradient. *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **270**: 207-214.
Tieleman, B.I., Williams, J.B. & Buschur, M.E. (2002). Physiological adjustments to arid and mesic environments in larks (Alaudidae). *Physiol. Biochem. Zool.* **75(3)**: 305-313.
Tieleman, B.I., Williams, J.B., Buschur, M.E. & Brown, C.R. (2003). Phenotipic variation of larks along an aridity gradient: are desert birds more flexible? *Ecology* **84(7)**: 1800-1815.
Tieleman, B.I., Williams, J.B., Michaeli, G. & Pinshow, B. (1999). The role of the nasal passages in the water economy of Crested Larks and Desert Larks. *Physiol. Biochem. Zool.* **72(2)**: 219-226.
Tilahun, S., Edwards, S. & Egziabher, T.B.G. eds. (1996). *Important Bird Areas of Ethiopia. A First Inventory*. Ethiopian Wildlife and Natural History Society, Addis Ababa.
Tily, I. (1951). Dunedin Naturalists' Field Club notes. *Notornis* **4**: 149-150.
Tily, I. (1953). New Zealand wrens. *Notornis* **5(6)**: 196.
Tobias, J.A. (2003a). Little-known Oriental bird. White-eyed River-martin *Eurochelidon sirintarae*. *Bull. Oriental Bird Club* **31**: 44-48.
Tobias, J.A. (2003b). Notes on breeding behaviour in Black-faced Cotinga *Conioptilon mcilhenny*. *Cotinga* **19**: 80-81.
Tobias, J.A., Catsis, M.C. & Williams, R.S.R. (1993). *Notes on Scarce Birds Observed in Southern and Eastern Brazil: 24 July to 7 September 1993*. Published privately.
Todd, W.E.C. (1922). Studies in the Tyrannidae. III. The South American forms of *Myiarchus*. *Proc. Biol. Soc. Washington* **35**: 181-218.
Todd, W.E.C. (1925). Sixteen new birds from Brazil and Guiana. *Proc. Biol. Soc. Washington* **38**: 91-100.
Todd, W.E.C. (1952). New tyrant flycatchers from South America. *Ann. Carnegie Mus.* **32(5)**: 291-304.
Todd, W.E.C. (1963). *Birds of the Labrador Peninsula and Adjacent Areas*. University of Toronto Press, Toronto, Ontario.
Todd, W.E.C. & Carriker, M.A. (1922). *The Birds of the Santa Marta Region of Colombia: a Study in Altitudinal Distribution*. Annals of the Carnegie Museum **14**. 579 pp.
Todd, W.E.C. & Worthington, W.W. (1911). A contribution to the ornithology of the Bahama Islands. *Ann. Carnegie Mus.* **7(3-4)**: 388-464.
Toepfer, S. & Stubbe, M. (2001). Territory density of the Skylark (*Alauda arvensis*) in relation to field vegetation in central Germany. *J. Orn.* **142(2)**: 184-194.
Took, J.M.E. (1961). Imitation by *Mirafra africana*. *Ostrich* **32**: 93-94.
Torres Báez, P. & Collazo, J.A. (1992). Reproductive biology and preliminary data on growth patterns of the Puerto Rican Flycatcher *Myiarchus antillarum* in Cabo Rojo, Puerto Rico. *Caribb. J. Sci.* **28**: 30-37.
Tossas, A.G. & Delannoy, C.A. (2001). Status, abundance, and distribution of birds of Maricao State forest, Puerto Rico. *Pitirre* **14(2)**: 47-53.
Tostain, O. (1979). Nidification sur un bateau de l'Hirondelle à ailes blanches, *Tachycineta albiventer*, en Guyane Française. *Gerfaut* **69**: 393-395.
Tostain, O. (1980). Contribution à l'ornithologie de la Guyane Française. *Oiseau et RFO* **50**: 47-62.
Tostain, O. (1988a). Le nid et la ponte de *Perissocephalus tricolor*, Cotingidae, en Guyane Française. [The nest and eggs of the Calfbird *Perissocephalus tricolor*, (Cotingidae), in French Guiana]. *Alauda* **56(2)**: 153-158. In French with English summary.
Tostain, O. (1988b). Nouvelles données sur la nidification de quatre manakins (Pipridae) de Guyane Française. [New information on the nesting of four species of manakin (Pipridae) in French Guiana]. *Alauda* **56(2)**: 159-170. In French with English summary.
Tostain, O. (1988c). Description du nid et de la ponte du Manakin à gorge blanche, *Corapipo gutturalis*, Pipridae. *Alauda* **56(2)**: 176-177..
Tostain, O. (1988d). [The nest and eggs of the Calfbird *Perissocephalus tricolor* (Cotingidae), in French Guiana]. *Alauda* **56(2)**: 153-158. In French with English summary.
Tostain, O. (1988e). Discovery of a nest of the Rufous-crowned Elaenia *Elaenia ruficeps* (Tyrannidae), in French Guiana. *Alauda* **56(2)**: 174.

Tostain, O., Dujardin, J.L., Érard, C. & Thiollay, J.M. (1992). *Oiseaux de Guyane*. Société d'Études Ornithologiques, Brunoy, France..
Trail, P.W. (1984). *The Lek Mating System of the Guianan Cock-of-the-rock: a Field Study of Sexual Selection*. PhD thesis, Cornell University, Ithaca, New York.
Trail, P.W. (1985a). A lek's icon: the courtship display of the Guianan Cock-of-the-rock. *Amer. Birds* **39**: 235-240.
Trail, P.W. (1985b). Territoriality and dominance in the lek-breeding Guianan Cock-of-the-rock. *Natl. Geogr. Res.* **1(1)**: 112-123.
Trail, P.W. (1985c). The lek mating system of the Cock-of-the-rock. *Natl. Geogr. Soc. Res. Rep.* **20**: 761-765.
Trail, P.W. (1987). Predation and antipredation behavior at Guianan Cock-of-the-rock leks. *Auk* **104(3)**: 496-507.
Trail, P.W. (1988). Sexual mimicry and social selection in a monomorphic lek-breeding bird. *Int. Conf. Behav. Ecol.* **2**: 109-110.
Trail, P.W. (1990). Why should lek-breeders be monomorphic? *Evolution* **44(7)**: 1837-1852.
Trail, P.W. & Adams, E.S. (1989). Active mate choice at Cock-of-the-rock leks: tactics of sampling and comparison. *Behav. Ecol. Sociobiol.* **25(4)**: 283-292.
Trail, P.W. & Donahue, P. (1991). Notes on the behavior and ecology of the red-cotingas (Cotingidae: *Phoenicircus*). *Wilson Bull.* **103(4)**: 539-551.
Trail, P.W. & Koutnik, D.L. (1986). Courtship disruption at the lek in the Guianan Cock-of-the-rock. *Ethology* **73(3)**: 197-218.
Trainer, J.M. & McDonald, D.B. (1993). Vocal repertoire of the Long-tailed Manakin and its relation to male-male cooperation. *Condor* **95(4)**: 769-781.
Trainer, J.M. & McDonald, D.B. (1995). Singing performance, frequency matching and courtship success of Long-tailed Manakins (*Chiroxiphia linearis*). *Behav. Ecol. Sociobiol.* **37(4)**: 249-259.
Trainer, J.M. & Parsons, R.J. (2001). Uniformity of Long-tailed Manakin songs from three localities in Costa Rica. *Wilson Bull.* **113(4)**: 431-434.
Trainer, J.M., McDonald, D.B. & Learn, W.A. (2002). The development of coordinated singing in cooperatively displaying Long-tailed Manakins. *Behav. Ecol.* **13(1)**: 65-69.
Tramer, E.J. (1980). Foraging ecology of migrant and resident warblers and vireos in the highlands of Costa Rica. Pp. 285-296 in: Keast & Morton (1980).
Travis, J.R. (1992). *Atlas of the Birds of Los Alamos County, New Mexico*. Los Alamos National Laboratory, Los Alamos, New Mexico.
Traylor, M.A. (1941). Birds from the Yucatan Peninsula. *Field Mus. Nat. Hist. (Zool. Ser.)* **24(19)**: 195-225.
Traylor, M.A. (1958). Birds of north-eastern Peru. *Fieldiana Zool.* **35(5)**: 87-141.
Traylor, M.A. (1963). *Check-list of Angolan Birds*. Publicações Culturais **61**. Companhía de Diamantes de Angola, Lisboa. 250 pp.
Traylor, M.A. (1977). A classification of the tyrant flycatchers (Tyrannidae). *Bull. Mus. Comp. Zool.* **148**: 128-184.
Traylor, M.A. ed. (1979a). *Check-list of Birds of the World: A Continuation of the Work of James L. Peters*. Vol. 8. Museum of Comparative Zoology, Harvard University Press, Cambridge, Massachusetts.
Traylor, M.A. (1979b). Two sibling species of *Tyrannus* (Tyrannidae). *Auk* **96(2)**: 221-233.
Traylor, M.A. (1982). Notes on tyrant flycatchers, Aves: Tyrannidae. *Fieldiana Zool.* **13**: 1-22.
Traylor, M.A. (1985). Species limits in the *Ochthoeca diadema* species-group (Tyrannidae). Pp. 430-442 in: Buckley *et al.* (1985).
Traylor, M.A. & Fitzpatrick, J.W. (1982). A survey of the tyrant flycatchers. *Living Bird* **19**: 7-50.
Traylor, M.A. & Parelius, D. (1967). A collection of birds from the Ivory Coast. *Fieldiana Zool.* **51**: 91-117.
Tree, A.J. (1962). The birds of the Leopardshill Area of the Zambezi Escarpment. *Ostrich* **33(4)**: 3-23.
Tree, A.J. (1963a). Three cases of melanism and albinism. *Ostrich* **34(3)**: 178.
Tree, A.J. (1963b). Pied Wagtail *Motacilla aguimp* displaying to Common Sandpiper *Tringa hypoleucos*. *Ostrich* **34(3)**: 181.
Tree, A.J. (1964). The occurrence of the Cliff Swallow (*Hirundo spilodera* (Sundevall)) on the Copperbelt. *Ostrich* **35**: 113-114.
Tree, A.J. (1965). Further records of albinism and melanism in central Africa. *Ostrich* **36(4)**: 227.
Tree, A.J. (1973). Banded Sand Martin *Riparia cincta*. *Ostrich* **44**: 130.
Tree, A.J. (1975). New distributional data 6: Tree Pipit *Anthus trivialis*. *Ostrich* **46(2)**: 178.
Tree, A.J. (1976). Movements of the Grey-rumped Swallow. *Honeyguide* **87**: 35.
Tree, A.J. (1986a). The Banded Sand Martin in Zimbabwe. *Honeyguide* **32**: 10-12.
Tree, A.J. (1986b). What is the status of the Pearl-breasted Swallow in Zimbabwe? *Honeyguide* **32**: 65-67.
Tree, A.J. (1986c). The European Sand Martin in Zimbabwe. *Honeyguide* **32**: 5-9.
Tree, A.J. (1987). Recent reports. *Honeyguide* **33**: 65-69.
Tree, A.J. (2002). The status of the Brown-throated Martin in Zimbabwe and neighbouring countries. *Honeyguide* **48**: 69-77.
Tree, A.J. & Earlé, R.A. (1984). The Brown-throated Sand Martin - a potential national ringing project. *Safring News* **13(2)**: 71-74.
Tree, A.J., Hustler, K., Aspinwall, D.R. & Fernsby, N. (1991). Red-throated Pipit - an addition to the Zimbabwean avifauna. *Honeyguide* **37**: 117-120.
Tregallas, T.H. (1921). Notes on the lyrebird. *Emu* **21**: 95-103.
Tregallas, T.H. (1931). The truth about lyrebirds. *Emu* **30**: 243-250.
Tregallas, T.H. (1997). The truth about the Lyrebird. *Bird Observer* **778**: 8-9.
Tretzel, E. (1965). Imitation und Variation von Schäeferpfiffen durch Haubenlerchen (*Galerida c. cristata*). Ein Beispiel für specielle Spottmotiv-Prädisposition. *Z. Tierpsychol.* **22**: 784-809.
Trilar, T. (1999). First observation of the Horned Lark *Eremophila alpestris* in Slovenia. *Acrocephalus* **20**: 3-5.
Triplet, P. (1981). Le Cochevis huppé *Galerida cristata* dans la Somme. *Oiseau et RFO* **51(4)**: 323-328.
Trost, C.H. (1972). Adaptations of Horned Larks (*Eremophila alpestris*) to hot environments. *Auk* **89(3)**: 506-527.
Trounson, D. & Trounson, M. (1987). *Australia. Land of Birds*. Collins, Sydney.
Tryjanowski, P. (1995a). Gastrolith numbers in the Skylark (*Alauda arvensis*). *Int. Stud. Sparrows* **20-21**: 41-42.
Tryjanowski, P. (1995b). Pokarm skowronka (*Alauda arvensis*) w okresie jesiennym. [Autumn diet of the Skylark (*Alauda arvensis*)]. *Notatki Orn.* **36(1-2)**: 176-178. In Polish with English summary.
Tryjanowski, P. (1995c). Sposoby zdobywania pokarmu przez skowronka (*Alauda arvensis* L., 1758) w okresie legowym. [Foraging techniques of the Skylark in the breeding season]. *Przeglad Zoologiczny* **39(1-2)**: 115-117.
Tryjanowksi, P. (2000). Ground song of the Skylark *Alauda arvensis*: frequency, temporal distribution and habitat dependence. [Bodengesang der Feldlerche *Alauda arvensis*: Häufigkeit, saisonale Verteilung und Habitatabhängigkeit]. *Vogelwelt* **121(1)**: 49-50. In English with German summary.
Tryjanowski, P. & Kuczynski, L. (1999). Shifting from outdoor to indoor breeding: House Martin's (*Delichon urbica*) defence against House Sparrow (*Passer domesticus*). *Folia Zoologica* **48**: 101-106.
Tsai Hangyeh (1985). Research report. Distribution and status of birds in northern Taiwan. Pp. 163-186 in: Anon. (1985).
Tschudi, J.J. von. (1844-1846). *Untersuchungen über di Fauna Peruana*. Scheitlin und Zollikofer. St Gallen, Switzerland.
Tsvelykh, A.N. & Goroshko, O.A. (1991). Age dimorphism in the wing shape of *Hirundo rustica*. *Zoologischeskii Zhurnal* **70**: 87-90.
Tubelis, D.P. (1998). Biologia reprodutiva de duas espécies de *Myiarchus* (Tyrannidae) utilizando caixas de nidificação instaladas em uma mata secundária. [Breeding biology of two species of *Myiarchus* flycatchers using nestboxes installed in a second-growth forest]. *Ararajuba* **6(1)**: 46-50. In Portuguese with English summary.
Tubelis, D.P. (2000). Mudanças na abundância de espécies de aves em cerrados *sensu stricto* em função da distância a matas de galeria, na região de Brasília. Pp. 199-200 in: Straube *et al.* (2000). (Abstract).
Tubelis, D.P. & Cavalcanti, R.B. (2001). Community similarity and abundance of bird species in open habitats of a central Brazilian cerrado. *Orn. Neotropical* **12**: 57-73.
Tubelis, D.P. & Tomas, W.M. (2000). Caracterização geral da avifauna da planície do Pantanal. Pp. 216-217 in: Straube *et al.* (2000). (Abstract).
Tucker, G.M. (1994). Skylark *Alauda arvensis*. Pp. 366-367 in: Tucker & Heath (1994).
Tucker, G.M. & Heath, M.F. (1994). *Birds in Europe: their Conservation Status*. BirdLife Conservation Series **3**. BirdLife International, Cambridge.
Tufts, R.W. (1986). *Birds of Nova Scotia*. 3rd edition. Nimbus Publications, Halifax, Nova Scotia.
Tunnicliffe, G.A. (1968). Distribution and breeding records of the Welcome Swallow for the South Island, New Zealand, 1955-1968. *Notornis* **15(4)**: 228-233.
Turbott, E.G. (1965). Welcome Swallow: first breeding records for South Island. *Notornis* **12(4)**: 241-244.
Turner, A.K. (1980). *The Use of Time and Energy by Aerial-feeding Birds*. PhD thesis, University of Stirling, Stirling, UK.
Turner, A.K. (1982a). Counts of aerial-feeding birds in relation to pollution levels. *Bird Study* **29**: 221-226.
Turner, A.K. (1982b). Timing of laying by Swallows (*Hirundo rustica*) and Sand Martins (*Riparia riparia*). *J. Anim. Ecol.* **51**: 29-46.
Turner, A.K. (1982c). Optimal foraging by the Swallow (*Hirundo rustica* L.): prey size selection. *Anim. Behav.* **30**: 862-872.
Turner, A.K. (1983a). Time and energy constraints on the brood size of Swallows (*Hirundo rustica*) and Sand Martins (*Riparia riparia*). *Oecologia* **59**: 331-338.
Turner, A.K. (1983b). Food selection and the timing of breeding of the Blue-and-white Swallow *Notiochelidon cyanoleuca* in Venezuela. *Ibis* **125(4)**: 450-462.
Turner, A.K. (1984). Nesting and feeding habits of Brown-chested Martins in relation to weather conditions. *Condor* **86(1)**: 30-35.
Turner, A.K. (1994a). *The Swallow*. Hamlyn, London.
Turner, A.K. (1994b). Swallow *Hirundo rustica*. Pp. 370-371 in: Tucker & Heath (1994).
Turner, A.K. & Bryant, D.M. (1979). Growth of nestling Sand Martins. *Bird Study* **26**: 117-122.
Turner, A.K. & Rose, C. (1989). *A Handbook to the Swallows and Martins of the World*. Christopher Helm, London.
Turner, D.A. (1977a). Status and distribution of the East African endemic species. *Scopus* **1(1)**: 2-11.
Turner, D.A. (1977b). A new host for the Black and White Cuckoo. *Scopus* **1**: 51-52.
Turner, D.A. (1985). On the claimed occurrence of the Spike-heeled Lark *Chersomanes albofasciata* in Kenya. *Scopus* **9**: 142.
Turner, D.A. (1991). East African Bird Report 1989: species report. *Scopus* **13(3)**: 137-164.
Turner, D.A. (1997). Threatened birds of Kenya. William's Lark *Mirafra williamsi*. *Kenya Birds* **6(1-2)**: 79-80.
Turner, P.B. (1962). Reports from junior members. *Albatross* **86**: 4-5.
Tutt, D. (1990). Rock Pipit breaking snail shell. *British Birds* **83(6)**: 239.
Tuttle, R.M. (1987). A six-year study of nesting Tree Swallows in Delaware State Park, Delaware, Ohio, 1979-1984. *Sialia* **9**: 3-7, 34.
Tweit, R.C. & Tweit, J.C. (2000). Cassin's Kingbird (*Tyrannus vociferans*). No. **534** in: Poole & Gill (2000b).
Tweit, R.C. & Tweit, J.C. (2002). Dusky-capped Flycatcher (*Myiarchus tuberculifer*). No. **631** in: Poole & Gill (2002).
Tye, A. (1985). Preuss's Cliff Swallow *Hirundo preussi* breeding in Sierra Leone. *Malimbus* **7**: 95-96.
Tye, A. & Tye, H. (1986). Nepal House Martin *Delichon nipalensis* new to Thailand. *Forktail* **1**: 83-85.
Tye, H. (1992). Reversal of breeding season by lowland birds at higher altitudes in western Cameroon. *Ibis* **134(2)**: 154-163.
Tyler, M.J. (1979). *The Status of Endangered Australasian Wildlife*. Royal Zoological Society of South Australia, Adelaide.
Tyler, S.J. (1972). Breeding biology of the Grey Wagtail. *Bird Study* **19**: 69-80.
Tyler, S.J. (1979). Mortality and movements of the Grey Wagtail. *Ringing & Migration* **2**: 122-131.
Tyler, S.J. (1998). An influx of Dusky Larks *Pinarocorys nigricans* in the Gaborone area in early 1998. *Babbler* **33**: 32-33.
Tyler, S.J. (2002a). Passage of a South African Cliff Swallow *Hirundo spilodera* through Botswana. *Babbler* **40**: 44-45.
Tyler, S.J. (2002b). Grey Wagtail *Motacilla cinerea*. Pp. 480-482 in: Wernham *et al.* (2002).
Tyler, S.J. & Borello, W.D. (1998). *Birds in the Gaborone Area and Where to Find Them*. Botswana Bird Club, Gaborone, Botswana.
Tyler, S.J. & Ormerod, S.J. (1986). Interactions between resident and migratory wagtails *Motacilla* spp. in Ethiopia - an ecological conundrum. *Scopus* **10**: 10-19.
Tyler, S.J. & Ormerod, S.J. (1987). Dietary overlap between Mountain Wagtails *Motacilla clara*, Grey Wagtails *M. cinerea* and Green Sandpipers *Tringa ochropus* in Ethiopia. *Scopus* **11**: 33-37.
Tyler, S.J. & Ormerod, S.J. (1991). The influence of stream acidification and riparian land-use on the breeding biology of Grey Wagtails *Motacilla cinerea* in Wales. *Ibis* **133(3)**: 286-292.
Tyler, S.J. & Ormerod, S.J. (1994). *The Dippers*. T & A.D. Poyser, London.
Uchida, H. & Nagata, H. (2000). [Site tenacity and survivorship of Japanese Wagtail *Motacilla grandis* on the Toki River, central Japan]. *Jap. J. Orn.* **49(1)**: 1-8. In Japanese with English summary.
Udvardy, M.D.F. (1963). Bird faunas of North America. Pp. 1147-1167 in: Sibley (1963).
Uhlig, R. (1992). Gebäudebruten der Felsenschwalbe, *Ptyonoprogne rupestris*, in Bulgarien. [*Ptyonoprogne rupestris* (Scopoli, 1769) nests on buildings in Bulgaria]. *Beitr. Vogelkd.* **38(5/6)**: 304-318. In German with English summary.
Uhlig, R. & Uhlig, S. (1996). Beobachtungen an Gebäudebrutern der Steinschwalbe *Hirundo obsoleta* in Israel and Sinai. *Monticola* **7**: 271-274.
Uhlig, R. & Uhlig, S. (1998). Beobachtungen an Gebäudebrutern der Steinschwalbe *Hirundo obsoleta* in den Vereinigten Arabischen Emiraten. *Monticola* **8**: 113-115.
Ullman, M. (1990). Bill shape of Calandra and Bimaculated Lark. *Dutch Birding* **12(2)**: 82-84.
Ullman, M. (1994). Crested and Thekla Larks in Morocco. *Dutch Birding* **16(1)**: 19-20.
Underhill, L. (1992). Waders (Charadrii) and other shorebirds at Dassen Island and the Algoa Bay Islands, South Africa. *Ostrich* **63**: 128-129.
Unitt, P. (1984). *The Birds of San Diego County*. Memoir **13**, San Diego Society of Natural History, San Diego, California.
Unitt, P. (1987). *Empidonax traillii extimus*: an endangered subspecies. *Western Birds* **18**: 137-162.
Urban, E.K. (1959). *Birds from Coahuila, Mexico*. University of Kansas Publications, Museum of Natural History **11(8)**. University of Kansas, Lawrence, Kansas. 74 pp.
Urban, E.K. (1980). *Ethiopia's Endemic Birds*. Ethiopian Tourism Organization. Addis Ababa.
Urban, E.K. & Brown, L.H. (1971). *A Checklist of the Birds of Ethiopia*. Addis Ababa University Press, Addis Ababa.
Urben-Filho, A., Gatto, C.A.F.R. & Straube, F.C. (2000). Avifauna do Parque Estadual do Cerrado, Jaguariaíva, Paraná. Pp. 347-348 in: Straube *et al.* (2000). (Abstract).
Uribe, F. & Hostau, J. (1988). Bases acústicas para un posible reconocimiento de los padres por sus crías en Avión Común, *Delichon urbica*. [Acoustic basis for a possible recognition of parents by offspring in House Martins *Delichon urbica*]. *Ardeola* **35**: 284-290. In Spanish with English summary.
Ussher, A. (1944). Nesting habits of Red-throated Rock Martin (*Ptyonoprogne r. rufigula*). *J. East Afr. & Uganda Nat. Hist. Soc.* **17**: 399.
Utter, J.M. & LeFebvre, E.A. (1970). Energy expenditure for free flight by the Purple Martin (*Progne subis*). *Comp. Biochem. Physiol.* **35**: 713-719.
Utter, J.M. & LeFebvre, E.A. (1973). Daily energy expenditure of Purple Martins (*Progne subis*) during the breeding season: estimates using D_2O^{18} and time budget methods. *Ecology* **54(3)**: 597-604.
Uys, C.J. (1984). The Longbilled Lark *Certhilauda curvirostris* in the W. Cape. *Promerops* **164**: 12-13.
Vader, W. (1982). Pied Wagtails catching young ghost crabs. *Ostrich* **53(4)**: 205.
Valentine, B.E., Roberts, T.A., Boland, S.P. & Woodman, A.P. (1988). Livestock management and productivity of Willow Flycatchers in the central Sierra Nevada. *Trans. West. Sec. Wildl. Soc.* **24**: 105-114.
Valenzuela, R.B. (1962). El cachudito *Spizitornis parulus* (Kittlitz). *Rev. Univ. Catól. Chile* **47**: 253-257.
Valkama, J. & Lehikoinen, E. (1994). Present occurrence and habitat selection of the Woodlark *Lullula arborea* in SW Finland. *Ornis Fenn.* **71(4)**: 129-136.
Valkiünas, G. & Iezhova, T. (2001). A comparison of the blood parasites in three subspecies of the Yellow Wagtail *Motacilla flava*. *J. Parasitol.* **87(4)**: 930-934.
Vallely, A.C. & Whitman, A.A. (1997). The birds of Hill Bank, northern Belize. *Cotinga* **8**: 39-49.
Valverde, J.A. (1957). *Aves del Sahara Español. (Estudio Ecológico del Desierto)*. Instituto de Estudios Africanos, Consejo Superior de Investigaciones Científicas, Madrid.
Valverde, J.A. (1961). *Vertebrados de las Marismas del Guadalquivir. Introducción a su Estudio Ecológico*. Archivos del Instituto de Aclimatación de Almería **9**. Consejo Superior de Investigaciones Científicas, Almería, Spain.
Van den Berg, A.B., van Ree, L. & Roselaar, C.S. (1983). [Blyth's Pipit at Westenschouwen in November 1983]. *Dutch Birding* **15(5)**: 198-206. In Dutch with English summary.
Van Ee, C.A. (1963). Cape Wagtail (*Motacilla capensis*) making its nest in a Hamerkop nest occupied by the Egyptian Goose. *Ostrich* **34(4)**: 253.
Van Fleet, W. (1876). Notes on the Rough-winged Swallow (*Hirundo serripennis*), in Pennsylvania. *Bull. Nuttall Orn. Club* **1**: 9-11.
Van Hecke, P. (1979a). Verhalten, Nest und Neststanddort des Baumpiepers. [Behaviour, nest and neststite of the Tree Pipit (*Anthus trivialis*)]. *J. Orn.* **120(3)**: 265-279. In German with English summary.
Van Hecke, P. (1979b). Zur Brutbiologie des Baumpiepers (*Anthus t. trivialis*): Legeperiode, Gelegegrösse, Bruterfolg. [On the breeding ecology of the Tree Pipit (*Anthus trivialis*): laying period, clutches, and breeding success]. *J. Orn.* **120(1)**: 12-29. In German with English summary.
Van Hecke, P. (1980a). Ei- und Flügelbiometrie, Körpergewicht und Flügelmauser beim Baumpieper (*Anthus trivialis*). *Vogelwelt* **101(3)**: 99-114.

Van Hecke, P. (1980b). Ei- und Flügelbiometrie, Körpergewicht und Flügelmauser beim Baumpieper (*Anthus trivialis*). [Egg and wing measurements, body weight and moult of the Tree Pipit (*Anthus trivialis*)]. *Vogelwelt* **101(4)**: 140-153. In German with English summary.

Van Hecke, P. (1981). Ortstreue, Altersaufbau und Mortalität einer Population des Baumpiepers (*Anthus t. trivialis*). [Site-tenacity, age structure and mortality in a population of the Tree Pipit (*Anthus t. trivialis*) in northern Belgium]. *J. Orn.* **122(1)**: 23-35. In German with English summary.

Van Loon, A.J. (2001). New species of flycatcher. *Dutch Birding* **23(1)**: 61.

Van Tyne, J. (1935). *The Birds of Northern Petén, Guatemala*. Miscellaneous Publications of the Museum of Zoology of the University of Michigan **27**. 50 pp.

Van Tyne, J. (1938). The Yucatan form of West Indian Cliff Swallow (*Petrochelidon fulva*). *Occas. Pap. Mus. Zool. Univ. Mich.* **385**: 1-3.

Vanhinsbergh, D.P. (2000). The ubiquitous Meadow Pipit: a useful indicator of habitat change. *BTO News* **229**: 12-13.

Vanhinsbergh, D.P. & Chamberlain, D.E. (2001). Habitat associations of Meadow Pipits *Anthus pratensis* in the British uplands. *Bird Study* **48(2)**: 159-172.

Vansteenwegen, C. (1982). Longévité et structure des nids d'Hirondelle de cheminée. *Aves* **19**: 247-251.

Vansteenwegen, C. (1988). Choix de l'habitat, fidélité et répartition spatiale chez l'Hirondelle de cheminée. *Alauda* **56(4)**: 350-364.

Vansteenwegen, C. (1992). Étude de passage et des retours de l'Hirondelle de cheminée (*Hirundo rustica*) en Belgique. *Aves* **29**: 155-176.

Varadinov, E. & Nankinov, D. (1978). [Subspecies-affiliation and biology of the Crested Lark in the area around Sofia]. *Orn. Inf. Bjull.* **3**: 18-25. In Bulgarian.

Vargas, H. (1996). What is happening with the avifauna of San Cristóbal? *Noticias de Galápagos* **57**: 23-24.

Varty, N., Adams, J., Espin, P. & Hambler, C. (1986). *An Ornithological Survey of Lake Tota, Colombia, 1982*. ICBP Study Report **12**, Cambridge. 103 pp.

Vasic, V., Matvejev, S. & Ham, I. (1980). Present range of Red-rumped Swallow in Serbia and adjacent countries. *Proc. Fauna Serb.* **1**: 85-100.

Vasilchenko, A.A. (1987). *The Birds of Khumar-Daban*. Nauka, Novosibirsk, Siberia.

Vaurie, C. (1951a). A study of Asiatic larks. Notes from the Walter Koelz Collections number 11. *Bull. Amer. Mus. Nat. Hist.* **97(5)**: 435–526.

Vaurie, C. (1951b). Notes on some Asiatic swallows. *Amer. Mus. Novit.* **1529**: 1-47.

Vaurie, C. (1954a). Systematic notes on Palearctic birds. No. 7. Alaudidae and Motacillidae (Genus *Anthus*). *Amer. Mus. Novit.* **1672**: 1-13.

Vaurie, C. (1954b). Systematic notes on Palearctic birds. No. 12. Muscicapinae, Hirundinidae, and Sturnidae. *Amer. Mus. Novit.* **1694**: 1-18.

Vaurie, C. (1955). Systematic Notes on Palearctic Birds. No. 18. Supplementary notes on Corvidae, Timaliinae, Alaudidae, Sylviinae, Hirundinidae, and Turdinae. *Amer. Mus. Novit.* **1753**: 1-19.

Vaurie, C. (1957a). Field notes on some Cuban birds. *Wilson Bull.* **69(4)**: 301-313.

Vaurie, C. (1957b). Systematic Notes on Palearctic Birds. No. 25. Motacillidae: the genus *Motacilla*. *Amer. Mus. Novit.* **1832**: 8-16.

Vaurie, C. (1959). *The Birds of the Palearctic Fauna: A Systematic Reference*. Order Passeriformes. Witherby, London.

Vaurie, C. (1972). *Tibet and its Birds*. H.F. & G. Witherby, London.

Vaurie, C. & Dharmakumarsinhji, K.S. (1954). A new Sand Lark from western India (Saurashtra). *J. Bombay Nat. Hist. Soc.* **52**: 8–9.

Vázquez, X. (2003). Bisbita Alpino *Anthus spinoletta*. Pp. 396-397 in: Martí & del Moral (2003).

Vega-Rivera, J.H., Ayala, D. & Haas, C.A. (2003). Home-range size, habitat use, and reproduction of the Ivory-billed Woodcreeper (*Xiphorhynchus flavigaster*) in dry forest of western Mexico. *J. Field Orn.* **74**: 141–151.

Veiga, J.O., Babarskas, M.P. & Acerbo, P.E. (2002). Nuevas observaciones de aves para la provincia de Neuquén, Argentina. *Nuestras Aves* **44**: 10-11.

Veit, R. & Petersen, W. (1993). *Birds of Massachusetts*. Massachusetts Audubon Society, Lincoln, Massachusetts.

Velasco, T., Bustamante, P., Galindo, A.J. & Torralvo, C. (2002). La situación de la Terrera Marismeña (*Calandrella rufescens*) en La Mancha (Ciudad Real-Cuenca-Toledo). Primeros datos de nidificación y localidades de invernada. Pp. 107-116 in: Torralbo, C. ed. (2002). *Anuario Ornitológico de Ciudad Real, 1995-2001*. SEO-Ciudad Real, Ciudad Real, Spain.

Velásquez, M.P. (1991). Aves frugívoras y su relación con la flora en un bosque húmedo en el municipio de San Carlos, Dpto. de Antioquia, Colombia. No. **57** in: Anon. (1991). (Abstract).

Venegas, C. & Schlatter, R. (1999). Efecto de la intervención silvícola en bosques de *Nothofagus pumilio* sobre ensambles avifaunísticos estivales en Tierra del Fuego (Chile). *Anales Inst. Patagonia* **27**: 41-50.

Venel, E. (1992). Le Cochevis huppé *Galerida cristata* dans la region d'Arras (Pas-de-Calais) en 1990 et 1991. *Heron* **25(2)**: 43-48.

Venier, L.A. & Robertson, R.J. (1991). Copulation behaviour of the Tree Swallow, *Tachycineta bicolor*: paternity assurance in the presence of sperm competition. *Anim. Behav.* **42**: 939-948.

Venter, C. (1999). More roosting Wagtes. *Bokmakierie* **185**: 20.

Venturini, A.C., Pacheco, M., de Paz, P.R. & do Carmo, L.P. (2001). Contribuição ao conhecimento das aves da região centro Serrana do Espírito Santo: municípios de Santa Maria do Jetibá e Itarana. Part 2. *Atualidades Orn.* **99**: 12.

Verbeek, N.A.M. (1967). Breeding biology and ecology of the Horned Lark in alpine tundra. *Wilson Bull.* **79**: 208-218.

Verbeek, N.A.M. (1970). Breeding ecology of the Water Pipit. *Auk* **87**: 425-451.

Verbeek, N.A.M. (1975). Comparative feeding behavior of three coexisting tyrannid flycatchers. *Wilson Bull.* **87**: 231–240.

Verbeek, N.A.M. (1981). Nesting success and orientation of Water Pipit *Anthus spinoletta* nests. *Ornis Scand.* **12(1)**: 37-39.

Verbeek, N.A.M. (1988). Development of a stable body temperature and growth rates in nestlings of three ground nesting passerines in alpine tundra. *J. Orn.* **129(4)**: 449-456. In English with German summary.

Verbeek, N.A.M. (1996). Occurrence of egg-capping in birds' nests. *Auk* **113(3)**: 703-705.

Verbeek, N.A.M. & Hendricks, P. (1994). American Pipit (*Anthus rubescens*). No. **95** in: Poole & Gill (1995).

Verea, C. & Solórzano, A. (1998). La avifauna del sotobosque de una selva decidua tropical en Venezuela. *Orn. Neotropical* **9**: 161-176.

Verea, C. & Solórzano, A. (2001). La comunidad de aves del sotobosque de un bosque deciduo tropical en Venezuela. *Orn. Neotropical* **12**: 235-253.

Verea, C., Fernández-Badillo, A. & Solórzano, A. (2000). Variación en la composición de las comunidades de aves de sotobosque de dos bosques en el norte de Venezuela. *Orn. Neotropical* **11**: 65-79.

Verheyden, C. (1994). First record of the Tawny-headed Swallow (*Alopochelidon fucata*) at the Falkland Islands. *Alauda* **62(2)**: 148-150.

Verheyen, R. (1952). Nos hirondelles (*Riparia riparia, Delichon urbica, Hirundo rustica*) dans leurs quartiers d'hiver. *Gerfaut* **42**: 92-124.

Verheyen, R. (1953). *Oiseaux. Pt. 19. Exploration du Parc National de l'Upemba*. Institut de Parcs Nationaux du Congo Belge, Bruxelles.

Verheyen, R. (1958). Contribution a l'anatomie de base et a la systématique des Alaudidae (Passeriformes). *Alauda* **26(1)**: 1-25.

Verheyen, R. (1959). Contribution to the systematics of the larks Alaudidae: what is *Certhilauda*? *Ostrich* **30**: 51-52.

Verner, J. (1980). Bird communities of mixed-conifer forests of the Sierra Nevada. Pp. 198–223 in: DeGraff, R.M. ed. (1980). *Management of Western Forests and Grasslands for Nongame birds*. USDA Forest Service General Technical Report **INT-86**.

Vernon, C.J. (1962). The occurrence of the Cliff Swallow *Hirundo spilodera* in southern Rhodesia. *Ostrich* **33**: 53.

Vernon, C.J. (1971). Nest of *Mirafra cheniana*. *Ostrich* **42**: 298-299.

Vernon, C.J. (1973). Vocal imitation by southern African birds. *Ostrich* **44**: 23-30.

Vernon, C.J. (1983a). Notes from the border. 11. Glimpses of unfamiliar birds: Yellow-breasted Pipit. *Bee-Eater* **10**(Suppl.): 4-6.

Vernon, C.J. (1983b). Notes on the Monotonous or White-tailed Bush Lark in Zimbabwe. *Honeyguide* **113**: 19-21.

Vernon, C.J. (1985). Striped Pipit at Sapkamma and Yellow Warbler at Amanzi. *Bee-eater* **36**: 23.

Vernon, C.J. & Dean, W.R.J. (1988). Further African bird-mammal feeding associations. *Ostrich* **59**: 38-39.

Verroken, L. & Verroken, D. (1991). [Citrine Wagtail at Harchies in April 1987: description of the bird and treatment of the field characters]. *Belg. Birding Mag.* **2(1)**: 1-11. In Dutch with French and English summary.

Verroken, L. & Verroken, D. (1993). [A spring record of Richard's Pipit in Belgium]. *Aves* **30(3-4)**: 221-225. In French with English summary.

Verroken, L. & Verroken, D. (1995). Nidification d'une Bergeronnette printanière des Balkans (*Motacilla flava feldegg*) en Hainaut occidental. Broedgeval van een Balkankwikstaart (*Motacilla flava feldegg*) in westerlijke Henegouwen. Brut einer Balkan-Schafstelze (*Motacilla flava feldegg*) in West-Hainaut. [Breeding record of a Black-headed Wagtail (*Motacilla flava feldegg*) in western Hainaut (Belgium)]. *Aves* **32(4)**: 219-226.

Verschoore, K. (1982). Notes on the breeding behaviour and habitat preference of the Skylark, Crested Lark and Meadow Pipit in the sand-dune region of De Panne (Belgian coast). *Veldornitologisch Tijdschrift* **5(1)**: 3-19.

Vesey-Fitzgerald, D.F. (1957). Nest of *Mirafra albicauda* White. *Bull. Brit. Orn. Club* **77**: 23-24.

Via, J.W. (1979). Foraging tactics of flycatchers in southwestern Virginia. In: Dickson, J.G., Conner, E.N., Fleet, R.R., Kroll, J.C. & Jackson, J.A. eds. (1979). *The Role of Insectivorous Birds in Forest Ecosystems*. Academic Press, New York.

Vickery, J.A. & Buckingham, D.L. (2001). The value of set-aside for Skylarks *Alauda arvensis* in Britain. Pp. 161-175 in: Donald & Vickery (2001).

Vickery, P.D., Casañas, H.E. & Di Giacomo, A.S. (2003). Effects of altitude on the distribution of Nearctic and resident grassland birds in Córdoba Province, Argentina. *J. Field Orn.* **74(2)**: 172-178.

Vidal-Rodríguez, R.M. (1992). Abundance and seasonal distribution of migrants during autumn in a Mexican cloud forest. Pp. 370–376 in: Hagan & Johnston (1992).

Vietinghoff-Riesch, A. (1955). *Die Rauchschwalbe*. Duncker & Humblot, Berlin.

Vignes, J.C. (1996). Analyses stomacales de l'Alouette des champs (*Alauda arvensis*), en migration automnale au Pays-Basque. [Stomach analyses of Skylarks (*Alauda arvensis*) during fall migration through the Basque Country]. *Munibe* **48**: 107-109.

Villarán, A. (1999). Invernada diferencial según sexos del Bisbita Ribereño Alpino *Anthus spinoletta* en un carrizal del centro de España. [Sexual differences in wintering Water Pipits *Anthus spinoletta* in a reedbed in central Spain]. *Butll. Grup Català d'Anellament* **16**: 17-22. In Spanish with English summary.

Vincent, A.W. (1944). Nesting site of the Banded Sand Martin. *Ostrich* **15**: 237.

Vincent, A.W. (1946). On the breeding habits of some African birds. *Ibis* **88**: 462-477.

Vincent, A.W. (1949). On the breeding habits of some African birds. *Ibis* **91(1)**: 111-139.

Vincent, J. (1951). The description of a new race of Richard's Pipit *Anthus richardi* Vieillot from Basutoland. *Ann. Natal Mus.* **12(1)**: 135-136.

Vincent, J. (1986). The type locality of *Anthus brachyurus eludens* Clancey, 1985. *Bull. Brit. Orn. Club* **106(3)**: 124-126.

Vincent, R.T. (1972). Fairy Martin in southern Tasmania. *Emu* **72**: 115-116.

Viney, C., Phillipps, K. & Lam, C.Y. (1994). *Birds of Hong Kong and South China*. 6th edition. Government Publications Centre, Hong Kong.

Vinicombe, K. (2003). Plain wanderer. *Birdwatch* **136**: 32-35.

Vinicombe, K. & Cottridge, D. (1996). *Rare Birds in Britain and Ireland. A Photographic Record*. Harper Collins, London.

Violani, C.G. & Barbagli, F. (1999). *Mirafra erythrocephala* Salvadori & Giglioli, 1885, an older name for *Mirafra assamica marionae* Baker, 1915. *Bull. Brit. Orn. Club* **119**: 189-192.

Virtanen, H. (1991). [The appearance and the nesting biology of the Woodlark in south-western Finland in 1989-1991]. *Lintumies* **26(6)**: 269-276. In Finnish.

Visbal, R., Manzanilla, J. & Fernández, A. (1996). *Importancia de los Vertebrados del Parque Nacional Henri Pittier y Consideraciones para su Conservación*. Universidad Central de Venezuela, Maracay, Venezuela.

Vittery, A., Squire, J.E. & Porter, R.F. (1972). *Ornithological Society of Turkey Bird Report 1968-1969*. Sandy, UK.

Voelker, G. (1999a). Dispersal, variance and clocks: historical biogeography and speciation in a cosmopolitan passerine (Genus *Anthus*: Motacillidae). *Evolution* **53**: 1536-1552.

Voelker, G. (1999b). Molecular evolutionary relationships in the avian genus *Anthus* (Pipits; Motacillidae). *Mol. Phylogen. Evol.* **11**: 84-94.

Voelker, G. (1999c). Body mass and moult data for South African motacillids, with body mass data for 47 additional species. *Ostrich* **70(3&4)**: 233-235.

Voelker, G. (2002). Systematics and historical biogeography of wagtails: dispersal versus vicariance revisited. *Condor* **104(4)**: 725-739.

Voelker, G. & Edwards, S.V. (1998). Can weighting improve bushy trees? Models of cytochrome b evolution and the molecular systematics of pipits and wagtails (Aves: Motacillidae). *Syst. Biol.* **47(4)**: 589-603.

Vogel, C. & Hennessey, A.B. (2002). Discovery of a new site for Ash-breasted Tit-tyrant *Anairetes alpinus* in Bolivia. *Cotinga* **17**: 80.

Voisin, J.C. (1958). Description du nid et des oeufs de *Lecythoplastes fuliginosa*. *Oiseau et RFO* **28**: 264-265.

Völker, O. (1952). Die Lipochrome in den Federn der Cotingiden. *J. Orn.* **93**: 122-129.

Voous, K.H. (1950). The races of Yellow Wagtail (*Motacilla flava*) wintering in the Indo-Australian archipelago. *Treubia* **20**: 647-656.

Voous, K.H. (1955). Origin of the avifauna of Aruba, Curaçao, and Bonaire. Pp. 329-332 in: Thomson (1955).

Voous, K.H. (1965). Check-list of the birds of Aruba, Curaçao, and Bonaire. *Ardea* **53(3/4)**: 205-234.

Voous, K.H. ed. (1972). *Proceedings of the XV International Ornithological Congress, The Hague 1970*. E.J. Brill, Leiden.

Voous, K.H. (1977). List of recent holarctic bird species. Passerines. *Ibis* **119(2)**: 223.

Voous, K.H. (1983). *Birds of the Netherlands Antilles*. De Walburg Pers, Zutphen, Netherlands.

Voous, K.H. (1985). Additions to the avifauna of Aruba, Curaçao, and Bonaire, South Caribbean. Pp. 247-254 in: Buckley *et al.* (1985).

Vowles, G.A. & Vowles, R.S. (1997). *An Annotated Checklist of the Birds of Brunei*. 2nd edition. Centro de Estudos Ornitologicos no Algarve, Silves, Portugal.

Vowles, R.S. & Vowles, G.A. (1985). Some notes on the birds of Borneo. *Bull. Brit. Orn. Club* **105(2)**: 71-73.

Vuilleumier, F. (1969). Field notes on some birds from the Bolivian Andes. *Ibis* **111(4)**: 599-608.

Vuilleumier, F. (1985). Forest birds of Patagonia: ecological geography, speciation, endemism, and faunal history. Pp. 255-304 in: Buckley *et al.* (1985).

Vuilleumier, F. (1994). Nesting, behavior, distribution, and speciation of Patagonian and Andean ground tyrants (*Myiotheretes, Xolmis, Neoxolmis, Agriornis*, and *Muscisaxicola*). *Orn. Neotropical* **5**: 1-55. In English with Spanish summary.

Vuilleumier, F. & Ewert, D.N. (1978). The distribution of birds in Venezuelan páramos. *Bull. Amer. Mus. Nat. Hist.* **162(2)**: 47-90.

Vuilleumier, F. & Williams, J.E. (1964). Notes on some birds of the Rio Conchos, Chihuahua, Mexico. *Condor* **66**: 515-516.

Vuilleumier, F., LeCroy, M. & Mayr, E. (1992). New species of birds described from 1981 to 1990. Pp. 267-309 in: Monk (1992).

Wade, I. (1994). Sani Pass and Lesotho highlands. *Laniarius* **53**: 18-21.

Wagner, H.O. (1951). Zugbeobachtungen an der Schwalbe *Stelgidopteryx ruficollis* in Mexico. *Vogelwarte* **16**: 59-62.

Wagner, R.H. (1998). Hidden leks: sexual selection and the clustering of avian territories. Pp. 123-145 in: Parker, P.G. & Burley, N.T. eds. (1998). *Avian Reproductive Tactics: Female and Male Perspectives*. Ornithological Monographs **49**. American Ornithologists' Union, Washington, D.C.

Wagner, R.H. & Morton, E.S. (1997). Sexual selection for delayed size maturation in a bird exhibiting delayed plumage maturation. *J. Avian Biol.* **28(2)**: 143-149.

Wagner, R.H., Davidar, P., Schug, M.D. & Morton, E.S. (1997). Do blood parasites affect paternity, provisioning and mate-guarding in Purple Martins? *Condor* **99(2)**: 520-523.

Wagner, R.H., Schug, M.D. & Morton, E.S. (1994). Coloniality and the control of extra-pair fertilization by female Purple Martins. Page 131 in: Dittami (1994). (Abstract).

Wagner, R.H., Schug, M.D. & Morton, E.S. (1996a). Condition-dependent control of paternity by female Purple Martins: implications for coloniality. *Behav. Ecol. Sociobiol.* **38(6)**: 379-389.

Wagner, R.H., Schug, M.D. & Morton, E.S. (1996b). Confidence of paternity, actual paternity and parental effort by Purple Martins. *Anim. Behav.* **52(1)**: 123-132.

Wagstaff, W.H. (1987). Calandra Lark in Scilly. *British Birds* **80(8)**: 382.

Wahl, T.R. & Wilson, H.E. (1971). Nesting record of European Skylark in Washington State. *Condor* **73(2)**: 254.

Wahlberg, N. (1990). Mimicry by Singing Bushlark *Mirafra javanica*. *Muruk* **4(2)**: 62.

Waiyaki, E.M. (1998). The avifauna and conservation status of South Nandi Forest, Kenya. *Centre Biodiversity Res. Rep.* **30**: 1-17.

Waiyaki, E.M. & Bennun, L.A. (1999). The avifauna of coastal forests in southern Kenya: status and conservation. *Ostrich* **71**: 247-256.

Wakeham-Dawson, A. & Aebischer, N.J. (1998). Factors determining winter densities of birds on Environmentally Sensitive Area arable reversion grassland in southern England, with special reference to Skylarks (*Alauda arvensis*). *Agric. Ecosyst. & Environm.* **70(2-3)**: 189-201.

Wakeham-Dawson, A., Szoszkiewicz, K., Stern, K. & Aebischer, N.J. (1998). Breeding Skylarks *Alauda arvensis* on Environmentally Sensitive Area arable reversion grass in southern England: survey-based and experimental determination of density. *J. Appl. Ecol.* **35(5)**: 635-648.

Walasz, K. & Mielczarek, P. eds. (1992). *The Atlas of Breeding Birds in Malopolska 1985-1991 (Southeastern Poland)*. Biologica Silesiae, Wroclaw, Poland. In Polish and English.

Waldenström, A. (1984). [The Corn Bunting, *Miliaria calandra*, and the Crested Lark, *Galerida cristata*, on Öland]. *Calidris* **13(3)**: 99-102.

Walker, B. (2001). *Field Guide to the Birds of Machu Picchu*. PROFONANPE & Machu Picchu Program, Lima.

Walker, B. (2002). Observations from the Tumbes Reserved Zone, dpto. Tumbes, with notes on some new taxa for Peru and a checklist of the area. *Cotinga* **18**: 37-43.

Walker, B., Stotz, D.F. & Fitzpatrick, J.W. (2003). Birds of the Manu Biosphere Reserve and their elevational limits, departments Cuzco and Madre de Dios, Peru. MS. 48 pp.

Walker, F.J. (1981a). Notes on the birds of northern Oman. *Sandgrouse* **2**: 33-55.

Walker, F.J. (1981b). Notes on the birds of Dhofar, Oman. *Sandgrouse* **2**: 56-90.

Walker, R. (1996). Avifauna registrada en la parte alta de la microcuenca Palogrande (sector del jardín botánico de la Universidad de Caldas). [Avifauna from the high area of the Palogrande watercourse (sector of the botanical garden of Caldas University)]. *Bol. Cient. Mus. Hist. Nat. Univ. Caldas* **1**: 11-15.

Walkinshaw, L.H. (1966). Summer biology of Traill's Flycatcher. *Wilson Bull.* **78**: 31-46.

Walkinshaw, L.H. (1967). The Yellow-bellied Flycatcher in Michigan. *Jack-pine Warbler* **45**: 2–9.

Walkinshaw, L.H. & Henry, C.J. (1957). Yellow-bellied Flycatcher nesting in Michigan. *Auk* **74**: 293–304.

Wall, L.E. & Wheeler, W.R. (1966). Lyrebirds in Tasmania. *Emu* **66**: 123-131.

Wallace, D.I.M. (1965). Studies of less familiar birds. 135. Thekla Lark. *British Birds* **58**: 337-341.

Wallace, D.I.M. (1983). The breeding birds of the Azraq Oasis and its desert surround, Jordan, in the mid-1960s. *Sandgrouse* **5**: 1-18.

Wallace, D.I.M. (1984). Selected observations from Lebanon, Syria and Jordan in the springs of 1963 and 1966. *Sandgrouse* **6**: 24-47.

Walsh, H. (1978). Food of nestling Purple Martins. *Wilson Bull.* **90(2)**: 248-260.

Walsh, J.F., Cheke, R.A. & Sowah, S.A. (1990). Additional species and breeding records of birds in the Republic of Togo. *Malimbus* **12(1)**: 2-18.

Walters, R. (1993). Some records of birds from Belize, Central America, including three first records. *Bull. Brit. Orn. Club* **113(3)**: 145-147.

Walters, R.E. (1983). *Utah Bird Distribution: Latilong Study 1983*. Utah Division of Wildlife Resource, Salt Lake City, Utah.

Walther, B.A. (2002). Vertical stratification and use of vegetation and light habitats by Neotropical forest birds. *J. Orn.* **143(1)**: 64-81.

Walther, B.A. (2004). Why canopy access is essential to understand canopy birds: four examples from the Surumoni Crane Project. *Orn. Neotropical* **15**.

Walton, K.C. (1979). Diet of Meadow Pipits *Anthus pratensis* on mountain grassland in Snowdonia. *Ibis* **121(3)**: 325-329.

Walton, K.C. (1984). Stomach stones in Meadow Pipits *Anthus pratensis*. *Bird Study* **31**: 39-42.

Wang, S.M. (1959). Preliminary studies on the life history of the House Swallow. *Acta Zool. Sinica* **11**: 138-144.

Wang Wen, Maruyama, N., Liu Bowen, Morimoto, H. & Gao Zhongxin (2002). Relationships between bird communities and vegetation structure in Honghua'erji, northern Inner Mongolia. *J. Forestry Res.* **13(4)**: 294-298.

Wang Xiangting ed. (1991). [*Vertebrate Fauna of Gansu*]. Gansu Scientific & Technical Press, Lanzhou, China. In Chinese.

Warburton, B., Kingsford, S.J., Lewitt, D.W. & Spurr, E.B. (1992). Plant species preferences of birds in lowland rimu (*Dacrydium cupressinum*) forest - implications for selective logging. *New Zealand J. Ecol.* **16(2)**: 119-126.

Ward, P. (1963). Lipid levels in birds preparing to cross the Sahara. *Ibis* **105(1)**: 109-111.

Ward, P. (1964). The fat reserves of Yellow Wagtails *Motacilla flava* wintering in southwest Nigeria. *Ibis* **106(3)**: 370-375.

Ward, P. & Zahavi, A. (1973). The importance of certain assemblages of birds as "information-centres" for food-finding. *Ibis* **115(4)**: 517-534.

Ward, S. (1992). *Energetics of Laying and Incubation in Birds: Studies of Swallows* Hirundo rustica, *Dippers* Cinclus cinclus *and Japanese Quail* Coturnix coturnix japonica. PhD thesis, University of Stirling, Stirling, UK.

Ward, S. (1995). Causes and consequences of egg size variation in Swallows *Hirundo rustica*. *Avocetta* **19**: 201-208.

Ward, S. (1996). Energy expenditure of female Barn Swallows *Hirundo rustica* during egg formation. *Physiol. Zool.* **69**: 930-951.

Wardill, J.C. (1995). *The Report of the Ornithological Expedition to the Rawa Aopa Watumohai National Park, South-east Sulawesi, Indonesia. 9th September - 9th November 1995*. Sulawesi '95 Ornithological Expedition & Symbiose Birdwatchers Club, Leeds & Jakarta.

Warkentin, I.G., Greenberg, R. & Ortiz, J.S. (1995). Songbird use of gallery woodlands in recently cleared and older settled landscapes of the Selva Lacandona, Chiapas, Mexico. *Conserv. Biol.* **9**: 1095–1106.

Wardle, C. (1995). Projects in the Bahamas. *Pitirre* **8(3)**: 14.

Wardrop, S.L. & Ydenberg, R.C. (2003). Date and parental quality effects in the seasonal decline in reproductive performance of the Tree Swallow *Tachycineta bicolor*: interpreting results in light of potential experimental bias. *Ibis* **145(3)**: 439-447.

Warham, J. & Bell, B.D. (1979). The birds of Antipodes Island, New Zealand. *Notornis* **26**: 121-169.

Warter, S.L. (1965). *The Cranial Osteology of the New World Tyrannoidea and its Taxonomic Implications*. Louisiana State University, Baton Rouge, Louisiana.

Wartmann, B.A. (1990). [Behavioural ecology of Water Pipit and wheatear in the Swiss Alps]. Pp. 383-389 in: van den Elzen, R., Schuchmann, K.L. & Schmidt-Koenig, K. eds. (1990). *Proceedings of the International Centennial Meeting of the Deutsche Ornithologen-Gesellschaft*. Current Topics in Avian Biology. In German with English summary.

Wassink, A. (1986). Plumage and behaviour of Pechora Pipit on its wintering grounds. *Dutch Birding* **8(4)**: 141-143.

Watanake, M. & Maruyama, N. (1977). Wintering ecology of the White Wagtail *Motacilla alba lugens* in the middle stream of Tama River. *Misc. Rep. Yamashina Inst. Orn.* **9**: 20-43.

Waterman, M.H. & Llewellyn, L.C. (1968). Further notes on White-backed Swallows and Rainbow-birds. *Austr. Bird Bander* **6**: 8-9.

Watling, D. (1982). *Birds of Fiji, Tonga and Samoa*. Millwood Press, Wellington, New Zealand.

Watling, D. (1983). Ornithological notes from Sulawesi. *Emu* **83(4)**: 247-261.

Watling, D. (2001). *A Guide to the Birds of Fiji and Western Polynesia, Including American Samoa, Niue, Samoa, Tokelau, Tonga, Tuvalu and Wallis & Futuna*. Environmental Consultants, Suva, Fiji.

Watson, D.M. (1999). Behavioural observations of pine-oak forest birds in southern Mexico. *Cotinga* **12**: 66-69.

Watson, G.E. (1962). A revision of Balkan, Aegean, and Anatolian Crested Larks. *Bull. Brit. Orn. Club* **82**: 9-18.

Watson, I. (1955). Some species seen at the Laverton Saltworks, Victoria, 1950-53, with notes on seasonal changes. *Emu* **55**: 224-228.

Watson, I. (1965). Mating of the Superb Lyrebird. *Emu* **65**: 129-132.

Watt, D.J. & Mock, D.W. (1987). A selfish herd of martins. *Auk* **104(2)**: 342-343.

Watts, D. (1999). *Field Guide to Tasmanian Birds*. New Holland, Sydney.

Wauer, R.H. (1973). *Naturalist's Big Bend*. Peregrine Productions, Santa Fe, New Mexico.

Wauer, R.H. (1996). *Field Guide to Birds of the Big Bend*. 2nd edition. Gulf Publication, Houston, Texas.

Wauer, R.H. (1997). *Birds of Zion National Park and Vicinity*. Utah State Press, Logan, Utah.

Wauer, R.H. (1998). Avian population survey of a Tamaulipan scrub habitat, Tamaulipas, Mexico. *Cotinga* **10**: 13-19.

Wauer, R.H. & Davis, D.G. (1972). Cave Swallows in Big Bend National Park, Texas. *Condor* **74**: 482.

Waugh, D.R. (1978). *Predation Strategies in Aerial-feeding Birds*. PhD thesis, University of Stirling, Stirling, UK.

Waugh, D.R. (1979). The diet of Sand Martins during the breeding season. *Bird Study* **26**: 123-128.

Waugh, D.R. & Hails, C.J. (1983). Foraging ecology of a tropical aerial feeding bird guild. *Ibis* **125(2)**: 200-217.

Weatherhead, P.J. (1984). Fecal sac removal by Tree Swallows, *Tachycineta bicolor*, the cost of cleanliness. *Condor* **86**: 187-191.

Weatherhead, P.J., Sealy, S.G. & Barclay, R.M.R. (1985). Risks of clustering in thermally stressed swallows. *Condor* **87**: 443-444.

Webb, R. & Smith, S. (1996). Degodi Lark *Mirafra degodiensis*, one of Africa's most poorly-known species. *Bull. African Bird Club* **3(2)**: 85-86.

Webber, T. (1996). Rare. West Indian Cave Swallow *Hirundo fulva fulva*. Pp. 341-347 in: Rodgers, J.A., Kale, H.W. & Smith, H.T. eds. (1996). *Rare and Endangered Biota of Florida*. Vol. 5. Birds. University Press of Florida, Gainesville, Florida.

Weber, S. & Hegelbach, J. (1993). [Differences in habitat use by Grey Wagtails *Motacilla cinerea* and White Wagtails *M. alba*]. *Orn. Beob.* **90(1)**: 39-52. In German with French and English summary.

Webster, H.O. (1962). Rediscovery of the Noisy Scrub-bird (*Atrichornis clamosus*). *West. Austr. Nat.* **8**: 57-59.

Webster, J.D. (1963). A revision of the Rose-throated Becard. *Condor* **65**: 383-399.

Weeks, H.P. (1979). Nesting ecology of the Eastern Phoebe in southern Indiana. *Wilson Bull.* **91**: 441–454.

Weeks, H.P. (1994). Eastern Phoebe (*Sayornis phoebe*). No. **94** in: Poole & Gill (1994).

Wege, D.C. (1993). Red data bird: Bare-necked Umbrellabird. *World Bridwatch* **15(2)**: 18-19.

Wege, D.C. & Long, A.J. (1995). *Key Areas for Threatened Birds in the Neotropics*. BirdLife Conservation Series **5**. BirdLife International, Cambridge.

Weghe, J.P.V. (1993). Akagera: Rwanda's National Park: a watershed for conservation in Africa. *Afr. Environm. & Wildl.* **1(2)**: 44-53.

Weibel, U. (1998). Habitat use of foraging Skylarks (*Alauda arvensis* L.) in an arable landscape with flower strips. *Bull. Geobot. Inst. ETH* **64**: 37-45.

Welch, G. & Welch, H. (1984). Birds seen on an expedition to Djibouti. *Sandgrouse* **6**: 1-23.

Wells, D.R. (1968). Zonation of bird communities on Fernando Poo. *Bull. Niger. Orn. Soc.* **5**: 71-87.

Wells, D.R. (1984). Bird report. 1978 and 1989. *Malay. Nat. J.* **38**: 111-150.

Wells, D.R. (1990). Malayan bird report: 1986 and 1987. *Malay. Nat. J.* **43**: 172-210.

Wendelken, P.W. & Martin, R.F. (1986). Recent data on the distribution of birds in Guatemala. *Bull. Brit. Orn. Club* **106(1)**: 16-22.

Wenny, D.G. (2000). Seed dispersal, seed predation, and seedling recruitment of a Neotropical montane tree. *Ecol. Monogr.* **70(2)**: 331-351.

Wenny, D.G. (2001). Advantages of seed dispersal: A re-evaluation of directed dispersal. *Evol. Ecol. Research* **3**: 51-74.

Wenny, D.G. & Levey, D.J. (1998). Directed seed dispersal by bellbirds in a tropical cloud forest. *Proc. Natl. Acad. Sci. USA* **95(11)**: 6204-6207.

Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (2002). *The Migration Atlas: Movements of the Birds of Britain and Ireland*. T. & A.D. Poyser, London.

Weske, J.S. (1972). *The Distribution of the Avifauna in the Apurimac Valley of Peru with Respect to Environmental Gradients, Habitat, and Related Species*. PhD. dissertation, University of Oklahoma, Norman, Oklahoma.

Weske, J.S. (1976). Western Flycatcher in Oklahoma. *Auk* **93**: 655–656

West, S. (1976). First description of the eggs of the Cinnamon Becard. *Condor* **78**: 422-423.

West, S. (1988). Status of the Cave Swallow (*Hirundo fulva*) in New Mexico. *New Mexico Orn. Soc. Bull.* **16**: 26-30.

West, S. (1991). *Behavior, Status, and Ecology of the Cave Swallow* (Hirundo fulva). MSc thesis, New Mexico Institute of Mining and Technology, Socorro, New Mexico.

West, S. (1995). Cave Swallow (*Hirundo fulva*). No. **141** in: Poole & Gill (1995).

Westcott, D.A. (1992). Inter- and intra-sexual selection: the role of song in a lek mating system. *Anim. Behav.* **44(4)**: 695-703.

Westcott, D.A. (1993). Habitat characteristics of lek sites and their availability for the Ochre-bellied Flycatcher, *Mionectes oleagineus*. *Biotropica* **25**: 444-451.

Westcott, D.A. (1994). Leks of leks: a role for hotspots in lek evolution? *Proc. Royal Soc. London (Ser. B Biol. Sci.)* **258(1353)**: 281-286.

Westcott, D.A. (1997a). Neighbors, strangers and male-male aggression as a determinant of lek size. *Behav. Ecol. Sociobiol.* **40(4)**: 235-242.

Westcott, D.A. (1997b). Lek locations and patterns of female movement and distribution in a Neotropical frugivorous bird. *Anim. Behav.* **53**: 235-247.

Westcott, D.A. & Graham, D.L. (2000). Patterns of movement and seed dispersal of a tropical frugivore. *Oecologia* **122**: 249-257.

Westcott, D.A. & Smith, J.N.M. (1994). Behavior and social organization during the breeding season in *Mionectes oleagineus*, a lekking flycatcher. *Condor* **96(3)**: 672–683.

Westcott, D.A. & Smith, J.N.M. (1997). Lek size variation and its consequences in the Ochre-bellied Flycatcher, *Mionectes oleagineus*. *Behav. Ecol.* **8**: 396-403.

Westerterp, K.R. & Bryant, D.M. (1984). Energetics of free existence in swallows and martins (Hirundinidae) during breeding: a comparative study using doubly labelled water. *Oecologia* **62**: 376-381.

Wetmore, A. (1916). *Birds of Puerto Rico*. US Department of Agriculture Bulletin **326**. 140 pp.

Wetmore, A. (1920). Observations on the habits of birds at Lake Burford, New Mexico. *Auk* **37**: 393-412.

Wetmore, A. (1926). *Observations on the Birds of Argentina, Paraguay, Uruguay and Chile*. US National Museum Bulletin **133**. Smithsonian Institution, Washington, D.C. 448 pp.

Wetmore, A. (1939). *Observations on the Birds of Northern Venezuela*. Proceedings of the US National Museum **87**. Smithsonian Institution, Washington, D.C. 87 pp.

Wetmore, A. (1941). Notes on birds of the Guatemalan highlands. *Proc. US Natl. Mus.* **89**: 523-581.

Wetmore, A. (1943). *The Birds of Southern Veracruz, Mexico*. Proceedings of the US National Museum **93**. 126 pp.

Wetmore, A. (1944). A collection of birds from northern Guanacaste, Costa Rica. *Proc. US Natl. Mus.* **95(3179)**: 25-80.

Wetmore, A. (1946). *The Birds of San José and Pedro González Islands, Republic of Panamá*. Smithsonian Miscellaneous Collections **106(1)**. Smithsonian Institution, Washington, D.C. 60 pp.

Wetmore, A. (1952). The birds of the islands of Taboga, Taboguilla, and Uravá, Panama. *Smiths. Misc. Coll.* **121**: 1-32.

Wetmore, A. (1957). *The Birds of Isla Coiba, Panamá*. Smithsonian Miscellaneous Collections **134**. Smithsonian Institution, Washington, D.C. 105 pp.

Wetmore, A. (1972). *The Birds of the Republic of Panama*. Vol. 3. Passeriformes: Dendrocolaptidae (Woodcreepers) to Oxyruncidae (Sharpbills). Smithsonian Miscellaneous Collections **150(3)**. Smithsonian Institution, Washington, D.C. 631 pp.

Wetmore, A. & Lincoln, F.C. (1933). Additional notes on the birds of Haiti and the Dominican Republic. *Proc. US Nat. Mus.* **82**: 1-68.

Wetmore, A. & Swales, B.H. (1931). *The Birds of Haiti and the Dominican Republic*. US National Museum Bulletin **155**. Smithsonian Institution, Washington, D.C. 483 pp.

Wetmore, A., Pasquier, R.F. & Olson, S.L. (1984). *The Birds of the Republic of Panama*. Vol. 4. Passeriformes: Dendrocolaptidae (Woodcreepers) to Oxyruncidae (Sharpbills). Smithsonian Miscellaneous Collections **150(4)**. Smithsonian Institution, Washington, D.C.

Weydemeyer, W. (1933). Nesting of the Rough-winged Swallow in Montana. *Auk* **50**: 362-363.

Weydemeyer, W. (1934a). Tree Swallows at home in Montana. *Bird Lore* **36**: 100-106.

Weydemeyer, W. (1934b). Singing of a Tree Swallow. *Auk* **51(1)**: 86-87.

Weydemeyer, W. (1935). Efficiency of nesting of the Tree Swallow. *Condor* **37(4)**: 216-217.

Wheelwright, N.T. (1985). Fruit size, gape width, and the diets of fruit-eating birds. *Ecology* **66(3)**: 808-818.

Wheelwright, N.T. (1988). Four constraints on coevolution between fruit-eating birds and fruiting plants: a tropical case history. Pp. 827-845 in: Ouellet (1988).

Wheelwright, N.T. (1991). How long do fruit-eating birds stay in the plants where they feed? *Biotropica* **23(1)**: 29-40.

Wheelwright, N.T. & Dorsey, F.B. (1991). Short-term and long-term consequences of predator avoidance by Tree Swallows (*Tachycineta bicolor*). *Auk* **108(3)**: 719-723.

Wheelwright, N.T. & Schultz, C.B. (1994). Age and reproduction in Savanna Sparrows and Tree Swallows. *J. Anim. Ecol.* **63**: 686-702.

Wheelwright, N.T., Leary, J. & Fitzgerald, C. (1991). The costs of reproduction in Tree Swallows (*Tachycineta bicolor*). *Can. J. Zool.* **69**: 2540-2547.

Whistler, H. (1923). On the breeding of certain wagtails. *J. Bombay Nat. Hist. Soc.* **29(1)**: 281-284.

Whistler, H. (1925). On the breeding of the Indian Tree Pipit *Anthus hodgsoni* in Kulu. *J. Bombay Nat. Hist. Soc.* **30(3)**: 701-702.

Whistler, H. (1932). On some larks of the Kashmir State. *Ibis* **Ser. 13, no. 2**: 470-479.

Whistler, H. (1936). The ornithology of Travancore and Cochin. *J. Bombay Nat. Hist. Soc.* **38**: 767–768.

Whistler, H. (1941). Differences in moult in closely allied forms. *Ibis* **Ser. 14, no. 5**: 173-174.

Whitacre, D.F. & Thorstrom, R.K. eds. (1992). *Maya Project: Use of Raptors and other Fauna as Environmental Indicators for Design, Management, and Monitoring of Protected Areas and for Building Local Capacity for Conservation in Latin America*. Progress Report **5**. The Peregrine Fund, Inc., Boise, Idaho.

White, A.W. (1998). Birding southern Abaco: a selection from ABA's upcoming birdfinding guide to the Bahama Islands. *Birding* **30(3)**: 196-207.

White, C.M.N. (1946). Notes on pipits of the *Anthus richardi* group and a new race of waxbill for northern Rhodesia. *Bull. Brit. Orn. Club* **67**: 8-10.

White, C.M.N. (1948). The African Plain-backed Pipits - a case of sibling species. *Ibis* **90(4)**: 547-553.

White, C.M.N. (1951). *Anthus pallidiventris* in Angola. *Ibis* **93(4)**: 627.

White, C.M.N. (1952). On the genus *Mirafra*. *Ibis* **94(4)**: 687-689.

White, C.M.N. (1956). Notes on African larks. Part III. *Bull. Brit. Orn. Club* **76(7)**: 120-124.
White, C.M.N. (1957a). Taxonomic notes on African pipits with the description of a new race of *Anthus similis*. *Bull. Brit. Orn. Club* **77**: 3-34.
White, C.M.N. (1957b). Notes on African larks. Part IV. *Bull. Brit. Orn. Club* **77(6)**: 103-104.
White, C.M.N. (1959a). Nomadism, breeding and subspeciation in some African larks. *Bull. Brit. Orn. Club* **79(4)**: 53-57.
White, C.M.N. (1959b). The limits of the genus *Mirafra*. *Bull. Brit. Orn. Club* **79(9)**: 163-166.
White, C.M.N. (1960a). Some inter relationships in the larks of the *Mirafra africana* group. *Bull. Brit. Orn. Club* **80(1)**: 7-10.
White, C.M.N. (1960b). The Ethiopian and allied forms of *Calandrella cinerea* (Gmelin). *Bull. Brit. Orn. Club* **80(2)**: 24-25.
White, C.M.N. (1961a). *A Revised Check List of African Broadbills, Pittas, Larks, Swallows, Wagtails and Pipits*. The Government Printer, Lusaka.
White, C.M.N. (1961b). The African Rough-winged Swallows. *Bull. Brit. Orn. Club* **81(2)**: 29-33.
White, C.M.N. (1965). The southern forms of *Mirafra africanoides* Smith. *Bull. Brit. Orn. Club* **86**: 143-144.
White, C.M.N. & Bruce, M.D. (1986). *The Birds of Wallacea (Sulawesi, The Moluccas & Lesser Sunda Islands, Indonesia). An Annotated Check-list*. BOU Check-list **7**. British Ornithologists' Union, London.
White, S.A. (2002). A mist-netting study in Guayaguayare and the Victoria Mayaro Forest Reserve, Trinidad, West Indies. Pp. 111-118 in: Hayes & Temple (2002).
Whitehead, D.R. & Taylor, T. (2002). Acadian Flycatcher (*Empidonax virescens*). No. **614** in: Poole & Gill (2002).
Whitehouse, S.M. (1978). Bimaculated Lark in Shetland. *British Birds* **71**: 462-463.
Whitmore, R.C. (1980). Reclaimed surface mines as avian habitat islands in the eastern forest. *Amer. Birds* **34**: 13-14.
Whitney, B.M. & Álvarez, A. (1998). A new *Herpsilochmus* antwren (Aves: Thamnophilidae) from northern Amazonian Peru and adjacent Ecuador: the role of edaphic heterogeneity of *terra firme* forest. *Auk* **115(3)**: 559-576.
Whitney, B.M. & Cohn-Haft, M. (2004). Unpublished research notes on *Poecilotriccus senex*. MS.
Whitney, B.M. & Kaufman, K. (1986). The *Empidonax* challenge, looking at *Empidonax*. Part III: the Alder/Willow problem (*Empidonax alnorum* and *E. traillii*). *Birding* **18(3)**: 153-159.
Whitney, B.M. & Kaufman, K. (1987). The *Empidonax* challenge, looking at *Empidonax*. Part IV: Acadian, Yellow-bellied, and Western Flycatchers (*Empidonax virescens*, *E. flaviventris*, and *E. difficilis*, respectively). *Birding* **18(6)**: 315-327.
Whitney, B.M., Pacheco, J.F. & Parrini, R. (1995). Two species of *Neopelma* in southeastern Brazil and diversification within the *Neopelma/Tyranneutes* complex: implications of the subspecies concept for conservation (Passeriformes: Tyrannidae). *Ararajuba* **3**: 43-53.
Whittaker, A. (1993). Notes on the behaviour of the Crimson Fruitcrow *Haematoderus militaris* near Manaus, Brazil, with the first nesting record for this species. *Bull. Brit. Orn. Club* **113**: 93-96.
Whittaker, A. (1994). The rediscovery of Pelzeln's Tody-tyrant *Hemitriccus inornatus* after 161 years! *Cotinga* **2**: 10.
Whittaker, A. (1995). Range extensions and nesting of the Gloss-backed Becard *Pachyramphus surinamus* in central Amazonian Brazil. *Bull. Brit. Orn. Club* **115(1)**: 45-48.
Whittaker, A. (1996a). Notes on feeding behavior, diet and anting of some cotingas. *Bull. Brit. Orn. Club* **116(1)**: 58-62.
Whittaker, A. (1996b). Range extensions of some cotingas from Rondonia, Brazil. *Bull. Brit. Orn. Club* **116(3)**: 198-199.
Whittaker, A. & Oren, D.C. (1999). Important ornithological records from the Río Juruá, western Amazonia, including twelve additions to the Brazilian avifauna. *Bull. Brit. Orn. Club* **119(4)**: 235-260.
Whittingham, L.A. & Dunn, P.O. (2001). Female responses to intraspecific brood parasitism in the Tree Swallow. *Condor* **103**: 166-170.
Whittingham, L.A. & Lifjeld, J.T. (1995a). Extra-pair fertilizations increase the opportunity for sexual selection in the monogamous House Martin *Delichon urbica*. *J. Avian Biol.* **26**: 283-288.
Whittingham, L.A. & Lifjeld, J.T. (1995b). High paternal investment in unrelated young: extra-pair paternity and male parental care in House Martins. *Behav. Ecol. Sociobiol.* **37**: 103-108.
Whittingham, L.A., Dunn, P.O. & Robertson, R.J. (1994). Do female Tree Swallows guard their mates by copulating frequently? *Anim. Behav.* **47**: 994-997.
Whittingham, L.A., Dunn, P.O. & Robertson, R.J. (1995). Do males exchange feathers for copulations in Tree Swallows? *Auk* **112(4)**: 1079-1080.
Whittingham, L.A., Slikas, B., Winkler, D.W. & Sheldon, F.H. (2002). Phylogeny of the Tree Swallow, genus *Tachycineta* (Aves: Hirundinidae), by Bayesian analysis of mitochondrial DNA sequences. *Mol. Phylogen. Evol.* **22(3)**: 430-441.
Whittingham, M.J. (1994). Observations at a nest of the Pacific Royal Flycatcher *Onychorhynchus coronatus occidentalis*. *Bull. Brit. Orn. Club* **114**: 131-132.
Whittingham, M.J. & Williams, R.S.R. (2000). Notes on morphological differences exhibited by Royal Flycatcher *Onychorynchus coronatus* taxa. *Cotinga* **13**: 14-16.
von Wicht, U. (1978). Zur Arealausweitung der Rötelschwalbe *Hirundo daurica* in Europa. *Anz. Orn. Ges. Bayern* **17(1/2)**: 79-98.
Wickler, S.J. & Marsh, R.L. (1981). Effects of nestling age and burrow depth on CO_2 and O_2 concentrations in the burrows of Bank Swallows (*Riparia riparia*). *Physiol. Zool.* **54**: 132-136.
Wickler, W. (1967). Der "Flügelgesang" der ostafrikanischen Klappenlerche *Mirafra rufocinnamomea* (Salvadori). *Vogelwelt* **88**: 161-165.
Wiedenfeld, D.A., Messick, L.R. & James, F.C. (1992). *Population Trends in 65 Species of North American Birds. 1966 - 1990*. Final Report to National Fish & Wildlife Foundation. US Fish & Wildlife Service & USDA Forest Service.
Wiedenfeld, D.A., Schulenberg, T.S. & Robbins, M.A. (1985). Birds of a tropical deciduous forest in extreme northwestern Peru. Pp. 305-315 in: Buckley *et al.* (1985).
Wiens, J.A. & Rotenberry, J.T. (1979). Diet niche relationships among North American grassland and shrubsteppe birds. *Oecologia* **42**: 253-292.
Wiens, J.A. & Rotenberry, J.T. (1980). Patterns of morphology and ecology in grassland and shrubsteppe bird populations. *Ecol. Monogr.* **50**: 287-308.
Wiens, J.A. & Rotenberry, J.T. (1985). Response of breeding passerines to rangeland alteration in a North American shrubsteppe locality. *J. Appl. Ecol.* **22**: 655-668.
Wiens, J.A., Rotenberry, J.T. & van Horne, B. (1986). A lesson in the limitations of field experiments: shrubsteppe birds and habitat alteration. *Ecology* **67**: 365-376.
Wiens, J.A., Rotenberry, J.T. & van Horne, B. (1987). Habitat occupancy patterns of North American shrubsteppe birds: the effects of spatial scale. *Oikos* **48**: 132-147.
Wiggins, D.A. (1989). Heritability of body size in cross-fostered Tree Swallow broods. *Evolution* **43**: 1808-1811.
Wiggins, D.A. (1990a). Sources of variation in egg mass of Tree Swallows *Tachycineta bicolor*. *Ornis Scand.* **21**: 157-160.
Wiggins, D.A. (1990b). Food availability, growth, and heritability of body size in nestling Tree Swallows (*Tachycineta bicolor*). *Can. J. Zool.* **68**: 1292-1296.
Wiggins, D.A. (1990c). Clutch size, offspring quality, and female survival in Tree Swallows - an experiment. *Condor* **92**: 534-537.
Wiggins, D.A. (1991). Natural selection on body size and laying date in the Tree Swallow. *Evolution* **45**: 1169-1174.
Wiggins, D.A. & Pärt, T. (1995). Sexual dimorphism and breeding success in Tree Swallows and Collared Flycatchers. *Condor* **97**: 267-271.
Wijesinghe, D.P. (1994). *Checklist of the Birds of Sri Lanka*. Ceylon Bird Club, Colombo.
Wilbur, S.R. (1987). *Birds of Baja California*. University of California Press, Berkeley.
Wiley, J. (1985). Shiny Cowbird *Molothrus bonariensis* parasitism in two avian communities in Puerto Rico. *Condor* **87**: 165-176.
Wiley, J. (1988). Host selection by the Shiny Cowbird. *Condor* **90**: 289-303.
Wilkins, A. (1972). Pipits in the South Island in winter. *Notornis* **19(1)**: 90.
Wilkinson, G.S. & English-Loeb, G.M. (1982). Predation and coloniality in Cliff Swallows (*Petrochelidon pyrrhonota*). *Auk* **99**: 459-467.
Wilkinson, R. (1996). Birdwatching in Brazil. *Avicult. Mag.* **102(2)**: 68-75.
Wilkinson, R. & Beecroft, R. (1988). *Kagoro Forest Conservation Study*. ICBP Study Report **28**. ICBP & Nigerian Conservation Foundation, Cambridge.
Willard, D.E., Foster, M.S., Barrowclough, G.F., Dickerman, R.W., Cannell, P.F., Coats, S.L., Cracraft, J.L. & O'Neill, J.P. (1991). *The Birds of Cerro de la Neblina, Territorio Federal Amazonas, Venezuela*. Fieldiana Zoology **65**. 80 pp.
Willemsen, D.J. (1980). [Crested Lark breeding on flat roof]. *Vogeljaar* **28(2)**: 103.
Williams, E. (1997). Birding in the Usambara Mountains, Tanzania. *Bull. African Bird Club* **4(2)**: 111-115.
Williams, G.R. (1975). *Birds of New Zealand*. A.H. & A.W. Reed, Wellington.
Williams, G.R. & Given, D.R. (1981). *The Red Data Book of New Zealand*. Nature Conservation Council, Wellington.
Williams, J.B. (1988). Field metabolism of Tree Swallows during the breeding season. *Auk* **105**: 706-714.
Williams, J.B. (1992). Longevity of Dune Larks in the Namib Desert. *Safring News* **21(1)**: 17-18.
Williams, J.B. (1998). Energetics of Dune Larks in the Namib Desert. Pp. 271-272 in: Anon. (1998b). (Abstract).
Williams, J.B. (1999). Heat production and evaporative water loss of Dune Larks from the Namib Desert. *Condor* **101(2)**: 432-438.
Williams, J.B. (2001). Energy expenditure and water flux of free-living Dune Larks in the Namib: a test of the reallocation hypothesis on a desert bird. *Functional Ecology* **15(2)**: 175-185.
Williams, J.B. & Tieleman, B.I. (2000). Flexibility in basal metabolic rate and evaporative water loss among Hoopoe Larks exposed to different environmental temperatures. *J. Exper. Biol.* **203**: 3153-3159.
Williams, J.B. & Tieleman, B.I. (2001). Physiological ecology and behavior of desert birds. Pp. 299-353 in: Nolan, V.J. & Thompson, C.F. eds. (2001). *Current Ornithology*. Vol. 16. Kluwer Academics & Plenum Publishers, New York.
Williams, J.B., Tieleman, B.I. & Shobrak, M. (1999). Lizard burrows provide thermal refugia for larks in the Arabian desert. *Condor* **101(3)**: 714-717.
Williams, M.D. ed. (1986). *Report on the Cambridge Ornithological Expedition to China 1985*. Cambridge Ornithological Expedition to China 1985, Scarborough, UK.
Williams, R.S.R. (1995a). Neotropical Notebook. Bolivia. *Cotinga* **4**: 66.
Williams, R.S.R. (1995b). Neotropical Notebook. Brazil. *Cotinga* **4**: 66-67.
Williams, R.S.R. (2002). Consumption of arboreal snails by Scaled Fruiteater *Ampelioides tschudii*. *Cotinga* **18**: 100.
Williams, R.S.R. (2002b). Plañidera Elegante. *Laniisoma buckleyi*. Page 398 in: Granizo (2002).
Williams, R.S.R. & Tobias, J.A. eds. (1994). *The Conservation of Southern Ecuador's Threatened Avifauna. Final Report of the Amaluza Projects, 1990-1991*. ICBP Study Report **60**. Cambridge.
Williamson, J. (1975). Food of some birds of La Pampa, Argentina. *Hornero* **11(4)**: 322-324.
Willis, D. (2003). Evidence for the occurrence of Pale-eyed Pygmy-tyrant *Atalotriccus pilaris* in Brazil. [Evidência para a ocorrência da maria-de-olho-claro, *Atalotriccus pilaris*, no Brasil]. *Ararajuba* **11(1)**: 141-144. In English with Portuguese summary.
Willis, E.O. (1962). Another nest of *Pitangus lictor*. *Auk* **79**: 111.
Willis, E.O. (1966). Notes on a display and nest of the Club-winged Manakin. *Auk* **83(3)**: 475-476.
Willis, E.O. (1972). *The Behavior of Spotted Antbirds*. Ornithological Monographs **10**. American Ornithologists' Union, Washington, D.C. 162 pp.
Willis, E.O. (1980). Ecological roles of migratory and resident birds on Barro Colorado Island, Panama. Pp. 205-225 in: Keast & Morton (1980).
Willis, E.O. (1984). Manakins (Aves, Pipridae) as army ant followers. *Ciênc. Cult.* **36**: 817-823.
Willis, E.O. (1986). Flycatchers, cotingas and drongos (Tyrannidae, Muscicapidae, Cotingidae and Dicruridae) as ant followers. *Giervalk* **73(3)**: 265-280.
Willis, E.O. (1988). Land-bird migration in São Paulo, southeastern Brazil. Pp. 754-764 in: Ouellet (1988).
Willis, E.O. (1991a). Association of open nests and sallying in the open in passerine families. *Ararajuba* **2**: 81-83. In English with Portuguese summary.
Willis, E.O. (1991b). Expansão geográfica de *Netta erythrophthalma*, *Fluvicola nengeta* e outras aves de zonas abertas com a "desertificação" antrópica em São Paulo. *Ararajuba* **2**: 101-102.
Willis, E.O. & Eisenmann, E. (1979). A revised list of birds of Barro Colorado Island, Panama. *Smithsonian Contrib. Zool.* **291**: 1-31.
Willis, E.O. & Oniki, Y. (1985). Bird specimens new for the state of São Paulo, Brazil. *Rev. Bras. Biol.* **45**: 105-108.
Willis, E.O. & Oniki, Y. (1988a). Winter nesting of *Iodopleura pipra* (Lesson, 1831) (Aves, Cotingidae) in southeastern Brazil. *Rev. Bras. Biol.* **48**: 161-167.
Willis, E.O. & Oniki, Y. (1988b). Bright crowns of female and young male Swallow-tailed Manakins, *Chiroxiphia caudata* (Shaw and Nodder 1793) (Aves, Pipridae). *Rev. Bras. Biol.* **48**: 439-441.
Willis, E.O. & Oniki, Y. (1988c). Bird conservation in open vegetation of São Paulo State, Brazil. Pp. 67-70 in: Goriup (1988b).
Willis, E.O. & Oniki, Y. (1990). Levantamento preliminar das aves de inverno em dez áreas do sudoeste de Mato Grosso, Brasil. [Preliminary survey of winter birds of ten localities in southwestern Mato Grosso, Brazil]. *Ararajuba* **1**: 19-38. In Portuguese with English summary.
Willis, E.O. & Oniki, Y. (1991). Avifaunal transects across the open zones of northern Minas Gerais, Brazil. *Ararajuba* **2**: 41-58.
Willis, E.O. & Oniki, Y. (1992). A new *Phylloscartes* (Tyrannidae) from southeastern Brazil. *Bull. Brit. Orn. Club* **112**: 158-165.
Willis, E.O. & Oniki, Y. (1993). New and reconfirmed birds from the state of São Paulo, Brazil, with notes on disappearing species. *Bull. Brit. Orn. Club* **113(1)**: 23-34.
Willis, E.O. & Oniki, Y. (1998). One-parent nesting in Cinnamon-vented Pihas (*Lipaugus lanioides*, Cotinginae, Tyrannidae). *Orn. Neotropical* **9(2)**: 129-159.
Willis, E.O., Wechsler, D. & Oniki, Y. (1978). On behavior and nesting of McConnell's Flycatcher (*Pipromorpha macconnelli*): does female rejection lead to male promiscuity? *Auk* **95(1)**: 1-8.
Willis, E.O., Snow, D.W., Stotz, D.F. & Parker, T.A. (1993). Olive-sided Flycatchers in southeastern Brazil. *Wilson Bull.* **105**: 193–194.
Willoughby, E.J. (1968). Water economy of the Stark's Lark and Grey-backed Finch-lark from the Namib Desert of South West Africa. *Comp. Biochem. Physiol.* **27**: 723-745.
Willoughby, E.J. (1971). Biology of larks (Aves: Alaudidae) in the central Namib Desert. *Zool. Afr.* **6(1)**: 133-176.
Wilson, A.S. (1926). Lista de aves del sur de Santa Fe. *Hornero* **3**: 349-363.
Wilson, J. (1988). Richard's Pipit nesting at Leeupan, Benoni. *Witwatersrand Bird Club News* **142**: 11-12.
Wilson, J. (1999). Bird's bathing habits. *Bokmakierie* **187**: 8-9.
Wilson, J.D. & Browne, S.J. (1993). Habitat selection and breeding success of Skylarks *Alauda arvensis* on organic and conventional farmland. *BTO Res. Rep.* **129**: 1-47.
Wilson, J.D., Evans, J., Browne, S.J. & King, J.R. (1997). Territory distribution and breeding success of Skylarks *Alauda arvensis* on organic and intensive farmland in southern England. *J. Appl. Ecol.* **34(6)**: 1462-1478.
Wilson, J.R. (1984). The avifauna of the Lobatse area, south-east Botswana. *Babbler* **8**: 17-45.
Wilson, M.G. (1984). Range expansion of Citrine Wagtail. *Dutch Birding* **6**: 143.
Wilson, R.G. & Ceballos-Lascurain, H. (1986). *The Birds of Mexico City*. BBC Printing & Graphics, Burlington, Ontario.
Wilson, R.R. & Cooper, R.J. (1998). Breeding biology of Acadian Flycatchers in a bottomland hardwood forest. *Wilson Bull.* **110**: 226-232.
Winding, N. (1990). [Habitat utilization of small Alpine birds in late summer/autumn (Hohe Tauern, Massiv, Austrian central Alps): autecology and community patterns]. *Ecol. Birds* **12(1)**: 13-37. In German with English summary.
Windsor, D. & Emlen, S.T. (1975). Predator-prey interactions of adult and prefledgling Bank Swallows and American Kestrels. *Condor* **77**: 359-361.
Wing, L. (1946). Species association in winter groups. *Auk* **63**: 508-511.
Winker, K. (1994). Divergence in the mitochondrial DNA of *Empidonax traillii* and *E. alnorum*, with notes on hybridization. *Auk* **111(3)**: 710-713.
Winker, K., Arriaga, S., Trejo, J.L. & Escalante, P. (1999). Notes on the avifauna of Tabasco. *Wilson Bull.* **111(2)**: 229-235.
Winkler, D.W. (1991). Parental investment decision rules in Tree Swallows: parental defense, abandonment and the so-called Concorde Fallacy. *Behav. Ecol.* **2**: 133-142.
Winkler, D.W. (1992). Causes and consequences of variation in parental defense behavior by Tree Swallows. *Condor* **94**: 502-520.
Winkler, D.W. (1993). Use and importance of feathers as nest lining in Tree Swallows (*Tachycineta bicolor*). *Auk* **110(1)**: 29-36.
Winkler, D.W. (1994). Anti-predator defence by neighbours as a responsive amplifier of parental defence in Tree Swallows. *Anim. Behav.* **47**: 595-605.
Winkler, D.W. & Allen, P.E. (1995). Effects of handicapping on female condition and reproduction in Tree Swallows (*Tachycineta bicolor*). *Auk* **112(3)**: 737-747.
Winkler, D.W. & Allen, P.E. (1996). The seasonal decline in Tree Swallow clutch size: physiological constraint or strategic adjustment? *Ecology* **77**: 922-932.
Winkler, D.W. & Sheldon, F.H. (1993). The evolution of nest construction in swallows (Hirundinidae): a molecular phylogenetic perspective. *Proc. Natl. Acad. Sci. USA* **90**: 5705-5707.
Winkler, D.W. & Sheldon, F.H. (1994). Phylogenetic hierarchy in character variability and its causes: lessons from character-state distributions in swallows, Hirundinidae. Page 342 in: Dittami (1994). (Abstract).

Winterbottom, J.M. (1939). Miscellaneous notes on some birds of northern Rhodesia. *Ibis* **Ser. 14, no. 3**: 712-734.
Winterbottom, J.M. (1942). A contribution to the ornithology of Barotseland. *Ibis* **Ser. 14, no. 6**: 337-389.
Winterbottom, J.M. (1958). Review of the races of the Spike-heeled Lark, *Certhilauda albofasciata* Lafresnaye. *Ann. S. Afr. Mus.* **44**: 53-67.
Winterbottom, J.M. (1959a). Review of the races of Cape Wagtail *Motacilla capensis* L. *Bull. Brit. Orn. Club* **79**: 89-100.
Winterbottom, J.M. (1959b). The range of *Anthus similis petricolus* Clancey. *Ostrich* **30(2)**: 91.
Winterbottom, J.M. (1960). Systematic notes on birds of the Cape Province. A further note on *Anthus novaeseelandiae* XIII. *Ostrich* **31(4)**: 178-179.
Winterbottom, J.M. (1961). Notes on the relations of the species of wagtails. *Bull. Brit. Orn. Club* **81**: 46-47.
Winterbottom, J.M. (1962). Some manuscript notes of S. F. Townsend for the period 1878-1925. *Ostrich* **52**: 66-71.
Winterbottom, J.M. (1963). The South African subspecies of the Buffy Pipit, *Anthus vaalensis* Shelley. *Ann. S. Afr. Mus.* **46(13)**: 341-352.
Winterbottom, J.M. (1964). Notes on the wagtails of *Motacilla*, southern Africa. *Ostrich* **35**: 129-141.
Winterbottom, J.M. (1965). A review of the southern subspecies of the Fawn-coloured Lark *Mirafra africanoides* Smith. *Oiseau* **35**: 163-174.
Winterbottom, J.M. (1968). The avifaunas of three fresh water habitats in the Southwest Cape. *Ostrich* **39(2)**: 130-138.
Winterbottom, J.M. (1972a). The avifauna of the arid districts of Africa. *Rev. Zool. Bot. Afr.* **85(1-2)**: 131-141.
Winterbottom, J.M. (1972b). Systematic notes on birds of the Cape Province. XXXI. A further note on *Calandrella sclateri*. *Ostrich* **43**: 133.
Winterbottom, J.M. & Wilson, A.H. (1959). Notes on the breeding of the Red-capped Lark *Calandrella cinerea* (Gmel.) at Cape Town. *Ostrich* **3**(Suppl.): 289-299.
With, K.A. & Webb, D.R. (1993). Microclimate of ground nests: the relative importance of radiative cover and wind breaks for three grassland species. *Condor* **95(2)**: 401-413.
Witham, J.W. & Hunter, M.L. (1992). Population trends of Neotropical migrant landbirds in northern coastal New England. Pp. 85-95 in: Hagan & Johnston (1992).
Witherby, H.F. ed. (1943). *The Handbook of British Birds*. Vol. 2. Warblers to Owls. Witherby, London.
Witherby, H.F., Jourdain, F.C.R., Ticehurst, N.F. & Tucker, B.W. (1943). *The Handbook of British Birds*. Vol. 1. Crows to Firecrest. Witherby, London.
Withers, P.C. (1977). Energetic aspects of reproduction by the Cliff Swallow. *Auk* **94**: 718-725.
Witt, K. (1982). Der Bergpieper (*Anthus sp. spinoletta*) als Gast im nordlichen Mitteleuropa. [The Water Pipit (*Anthus sp. spinoletta*) as a visitor to the northern part of central Europe]. *Vogelwelt* **103(3)**: 90-111. In German with English summary.
Wittenberg, J. (1999). Neue Gebäudebruten der Felsenschwalbe (*Ptyonoprogne rupestris*) in Süd-Deutschland 1998. *Orn. Anz.* **38**: 55-59.
Woinarski, J.C.Z. (1998). Research and management for the conservation of birds in Australia. Pp. 383-393 in: Marzluff, J.M. & Sallabanks, R. eds. (1998). *Avian Conservation. Research and Management*. Island Press, Washington, D.C.
Wolf, B.O. (1997). Black Phoebe (*Sayornis nigricans*). No. **268** in: Poole, A.F. & Gill, F.B. eds. (1997). *The Birds of North America*. Vol. 7. Academy of Natural Sciences & American Ornithologists' Union, Philadelphia & Washington, D.C.
Wolf, B.O. & Jones, S.L. (2000). Vermilion Flycatcher (*Pyrocephalus rubinus*). No. **484** in: Poole & Gill (2000a).
Wolf, L.L. (1976). Avifauna of the Cerro de la Muerte region, Costa Rica. *Amer. Mus. Novit.* **2606**: 1-37.
van der Wolf, P. (1989). Calandra Lark on Texel in May 1988. *Dutch Birding* **11(2)**: 70-73.
Wolfenden, I.H. & Peach, W.J. (2001). Annual survival rates of Skylarks on a coastal dune system. Pp. 79-89 in: Donald & Vickery (2001).
Wolinski, R.A. (1980). Rough-winged Swallow feeding of fly larvae. *Wilson Bull.* **92(1)**: 121-122.
Wolinski, R.A. (1985a). Bathing behavior of Purple Martins. *Wilson Bull.* **97(1)**: 127-128.
Wolinski, R.A. (1985b). Polygamy and promiscuous behavior in the Barn Swallow. *J. Field Orn.* **56**: 426-427.
Won Pyongoh (1993). [*A Field Guide to the Birds of Korea*]. Kyo-Hak Publishing Co. Ltd. Seoul. In Korean.
Won Pyongoh, Woo Hanchung, Ham Kyuwhang, Chun Miza & Park Yungsik (1968). [Chick food analysis of some Korean birds (II)]. *Misc. Rep. Yamashina Inst. Orn.* **5(3)**: 259-277. In Japanese with English summary.
Wood, A.J. (1993). Bushveld Pipits duetting. *Honeyguide* **39(4)**: 198.
Wood, B. (1975). The distribution of races of the Yellow Wagtail overwintering in Nigeria. *Bull. Niger. Orn. Soc.* **11(39)**: 19-26.
Wood, B. (1976). *The Biology of Yellow Wagtails* Motacilla flava *L. Overwintering in Nigeria*. PhD thesis, University of Aberdeen.
Wood, B. (1978). Weights of Yellow Wagtails wintering in Nigeria. *Ringing & Migration* **2(1)**: 20-26.
Wood, B. (1979). Changes in numbers of over-wintering Yellow Wagtails *Motacilla flava* and their food supplies in a West African savanna. *Ibis* **121(2)**: 228-231.
Wood, B. (1982). The trans-Saharan migration of Yellow Wagtails *Motacilla flava*. *J. Zool., London* **197(2)**: 267-284.
Wood, B. (1988). Roadside bird counts from southern Somalia. *Scopus* **11(3/4)**: 87-93.
Wood, B. (1992). Yellow Wagtail *Motacilla flava* migration from West Africa to Europe - pointers towards a conservation strategy for migrants on passage. *Ibis* **134**(Suppl.): 66-76.
Wood, D.S., Leberman, R.C. & Weyer, D.S. (1986). *Checklist of the Birds of Belize*. Carnegie Museum of Natural History Special Publication **12**.
Wood, M. (1973). Nesting behaviour of the Welcome Swallow. *Austr. Bird Watcher* **4**: 270-271.
Woodall, P.F. (1975). A bill deformity in Richard's Pipit and the presence of mycobacterium. *Bull. Brit. Orn. Club* **95(2)**: 45-46.
Woodard, J.D. & Murphy, M.T. (1999). Sex roles, parental experience and reproductive success of Eastern Kingbirds, *Tyrannus tyrannus*. *Anim. Behav.* **57(1)**: 105-115.
Woodell, S.R J. (1979). Nesting of the American Water Pipit *Anthus spinoletta rubescens* (Tunstall) at Godhavn, west Greenland. *Dan. Orn. Foren. Tidssk.* **73(3)**: 177-179. In English with Danish summary.
Woods, C.A. & Ottenwalder, J.A. (1986). *Birds of the National Parks of Haiti*. University of Florida, Gainsville, Florida.
Woods, D.S., Leberman, R.C. & Weyer, D. (1986). *Checklist of the birds of Belize*. Carnegie Museum Special Publications **12**. 24 pp.
Woods, R.W. (1988). *Guide to the Birds of the Falkland Islands*. Anthony Nelson Ltd, Oswestry, UK.
Woods, R.W. & Woods, A. (1997). *Atlas of Breeding Birds of the Falkland Islands*. Anthony Nelson, Oswestry, UK.
Woollard, E. & Woollard, J. (1989). Some nesting notes on the Greater Striped Swallow. *Babbler* **18**: 44-46.
Wormington, A. (1999). Cave Swallow - second record for Ontario and the Great Lakes region. *Birders J.* **8**: 35-37.
Worthington, A.H. (1982a). Population sizes and breeding rhythms of two species of manakins in relation to food supply. Pp. 213-225 in: Leigh, E.G., Rand, A.S. & Winsor, D.M. eds. (1982). *The Ecology of a Tropical Forest: Seasonal Rhythms and Long-term Changes*. Smithsonian Institution, Washington, D.C.
Worthington, A.H. (1982b). Food quality and foraging efficiency: the digestive strategies of two species of avian frugivores. *Bull. Ecol. Soc. Amer.* **63(2)**: 84. (Abstract).
Worthington, A.H. (1983). *Foraging Ecology and Digestive Adaptations of Two Avian Frugivores:* Manacus vitellinus *and* Pipra mentalis. PhD thesis, University of Washington, D.C.
Worthington, A.H. (1989). Adaptations for avian frugivory: assimilation efficiency and gut transit time of *Manacus vitellinus* and *Pipra mentalis*. *Oecologia* **80**: 381-389.
Wotton, S.R. (2000). The lark's ascent. *Birdwatch* **93**: 6-10.
Wotton, S.R. & Gillings, S. (2000). The status of breeding Woodlarks *Lullula arborea* in Britain in 1997. *Bird Study* **47(2)**: 212-224.
Wright, A. (1964). Welcome Swallows at The Brothers. *Notornis* **11(3)**: 193.
Wright, A. & Bell, B.D. (1960). Rare birds at Farewell Spit. *Notornis* **8(8)**: 260-262.
Wright, J.M. (1997). *Olive-sided Flycatchers in Central Alaska, 1994–1996*. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration, Final Report Project **SE-3-4**, Juneau, Alaska.
Wright, S.J., Faaborg, J. & Campbell, C.J. (1985). Birds form tightly structured communities in the Pearl Archipelago, Panama. Pp. 798-812 in: Buckley *et al.* (1985).
Wu Yi, Yuan Chonggui *et al.* (1989). The food habits of the Small Skylark *Alauda gulgula*. *Sichuan J. Zool.* **8(2)**: 36.
Wuetherich, D., Azocar, A., García-Núñez, C. & Silva, J.F. (2001). Seed dispersal in *Palicourea rigida*, a common treelet species from neotropical savannas. *J. Trop. Ecol.* **17**: 449-458.
Wunderle, J. (1981). Avian predation upon *Anolis* lizards on Grenada West Indies. *Herpetologica* **37(2)**: 104-108.
Wunderle, J. & Latta, S. (1996). Avian abundance in sun and shade coffee plantations and remnant pine forest in the Cordillera Central, Dominican Republic. *Orn. Neotropical* **7**: 19-34.
Wunderlich, K. (1987). *Chersophilus duponti* (Vieillot). In: Liedel, K., Loskot, W.M., Neufeldt, I.A., Vietinghoff-Scheel, E.V. & Wunderlich, K. eds. (1987). *Atlas der Verbreitung Palearktischer Vogel*. 14. Akademie-Verlag, Berlin.
Wunderlich, W. (1980). *Galerida theklae* Brehm. In: Dathe, H. & Neufeldt, I.A. eds. (1980). *Atlas der Verbreitung Palearktischer Vogel* **8**. Akademie-Verlag, Berlin.
Würtele, K.H. (1986). Beobachtungen am Schlafplatz der Bachstelze (*Motacilla alba*). [Observations at roost sites of the White Wagtail (*Motacilla alba*)]. *Orn. Mitt.* **38(10)**: 247-249.
Wyllie, I. (1981). *The Cuckoo*. B.T. Batsford, London.
Xu, S. (1992). [The ecology and reproduction of *Alauda arvensis intermedia*]. *Chinese J. Zool.* **27(5)**: 18-20. In Chinese.
Yablonovska, E.D. (1993). [About the clinal variation of some morphological parameters of the Tree Pipit]. *Berkut* **2**: 31-33. In Russian with English summary.
Yaich, J.A. & Larrison, E.J. (1973). Nesting record and behavioral observations on the Gray Flycatcher. *Murrelet* **54**: 14–16.
Yamagishi, S., Masuda, T. & Rakotomanana, H. (1997). *A Field Guide to the Birds of Madagascar*. Kaiyusha Publishers Co., Hatsudai, Japan.
Yanes, M. (2000). *La Depredación en Nido de los Aláudidos Almerienses. Una Aproximación desde la Biología de la Conservación y la Ecología Evolutiva*. Instituto de Estudios Almerienses. Almería, Spain.
Yanes, M. & Oñate, J.J. (1996). Does nest predation affect nest-site selection in larks? *Rev. Écol. (Terre Vie)* **51(3)**: 259-267.
Yanes, M. & Suárez, F. (1995). Nest predation patterns in ground-nesting passerines on the Iberian Peninsula. *Ecography* **18**: 423-428.
Yanes, M. & Suárez, F. (1996a). Incidental nest predation and lark conservation in an Iberian semiarid shrubsteppe. *Conserv. Biol.* **10(3)**: 881-887.
Yanes, M. & Suárez, F. (1996b). Mortalidad en nido y viabilidad poblacional de aláudidos. *Ardeola* **43(1)**: 57-68.
Yanes, M. & Suárez, F. (1997). Nest predation and reproductive traits in small passerines: a comparative approach. *Acta Oecol.* **18**: 413-426.
Yanes, M., Herranz, J., Manrique, J., del Moral, J.C. & Suárez, F. (1997). La orientación de los nidos de paseriformes esteparios. *Doñana Acta Vertebrata* **24(1-2)**: 210-217.
Yanes, M., Herranz, J. & Suárez, F. (1995). Nest microhabitat selection in larks from a European semi-arid shrubsteppe: the role of sunlight and predation. *J. Arid Environm.* **32(4)**: 469-478.
Yanes, M., Herranz, J. & Suárez, F. (1996). Facultative nest-parasitism among Iberian shrubsteppe passerines. *Bird Study* **43(1)**: 119-123.
Yanes, M., Suárez, F. & Manrique, J. (1991). La Cogujada Montesina, *Galerida theklae*, como depredador del caracol *Otala lactea*: comportamiento alimentario y selección de presa. *Ardeola* **38(2)**. 297-303.
Yang Guisheng & Xing Lianlian (2000). [Initial research of birds in the Chagannor area, China]. Pp. 299-303 in: Anon. (2000d). In Chinese
Yesilevskaya, M.A. (1972). [Ecological and morphological characteristics of the maxillary apparatus and flight organs of the larks, Alaudidae]. *Biologicheskie Nauki* **15(7)**: 25-32. In Russian.
Yesilevskaya, M.A. (1986). Some eco-morphological peculiarities of the jaw apparatus in larks (Alaudidae). Page 1192 in: Ilyichev, V.D. & Gavrilov, V.M. eds. (1986). *Proceedings of the XVIII International Ornithological Congress, Moscow 1982*. (Abstract).
Yesilevskaya, M.A. & Pivneva, M.A. (1996). Ecological aspect of jaw muscles morphological structure comparison in relative species of *Melanocorypha*. *Ornitologiya* **27**: 214-230.
Yesou, P. (1992). Wagtails of Taimyr Peninsula. *Dutch Birding* **14(2)**: 48-49.
Yoon Mooboo (1992). [*Wild Birds of Korea in Color*]. Kyo-Hak Publishing Co. Ltd, Seoul. In Korean.
York, D.L., Cummings, J.L., Engeman, R.M. & Davis, J.E. (2000). Evaluation of Flight Control™ and Mesurol® as repellents to reduce Horned Lark (*Eremophila alpestris*) damage to lettuce seedlings. *Crop Protection* **19**: 201-203.
Yosef, R. & Maika, R. (1998). Avian conservation in Israel. Pp. 345-354 in: Marzluff, J.M. & Sallabanks, R. eds. (1998). *Avian Conservation: Research and Management*. Island Press, Washington, D.C. & Covelo, California.
Young, B.E. & Zook, J.R. (1999). Nesting of four poorly-known bird species on the Caribbean slope of Costa Rica. *Wilson Bull.* **111(1)**: 124-128.
Young, C. (1983). Noisy Scrub-bird - a success story. *State Wildl. Authority News Serv.* **13(2)**: 3-9.
Young, C.G. (1929). A contribution to the ornithology of the coastland of British Guiana. *Ibis* **Ser. 12, no. 5**: 221-261.
Young, C.G. (1946). Notes on some birds of Cameroon Mountain District. *Ibis* **88(3)**: 348-382.
Young, G. (1995). Annotated list of the birds of Lac Bemamba area. *Working Group on Birds in the Madagascar Region Newsletter* **5(2)**: 14-19.
Yu Yixin & Cheng Tsohsin (1962). Two new records of Chinese birds in southern Yunnan - Rufous-necked Laughing Thrush *Garrulax ruficollis* and Dusky Crag Martin *Ptyonoprogne concolor*. *Acta Zool. Sinica* **14(2)**: 287.
Yuan Chonggui, Wu Yi *et al.* (1982). Breeding habits of the Lesser Skylark *Alauda gulgula*. *Wildlife* **3**: 33-37.
Yuan Hsiaowei (1996). Habitat selection by Lesser Skylarks (*Alauda gulgula wattersi*) in Taiwan. *Acta Zool. Taiwanica* **7(2)**: 9-18.
Yunick, R.P. (1971). A study of a Tree Swallow colony over water. *Kingbird* **21**: 47-56.
Yuri, T. & Rohwer, S. (1997). Molt and migration in the Northern Rough-winged Swallow. *Auk* **114(2)**: 249-262.
Zach, R. (1982). Hatching asynchrony, egg size, growth, and fledging in Tree Swallows. *Auk* **99**: 695-700.
Zach, R. & Mayoh, K.R. (1982a). Weight and feather growth of nestling Tree Swallows. *Can. J. Zool.* **60**: 1080-1090.
Zach, R. & Mayoh, K.R. (1982b). Breeding biology of Tree Swallows and House Wrens in a gradient of gamma radiation. *Ecology* **63**: 1720-1728.
Zach, R. & Mayoh, K.R. (1984). Gamma radiation effects on nestling Tree Swallows. *Ecology* **65**: 1641-1647.
Zach, R. & Mayoh, K.R. (1986). Gamma irradiation of Tree Swallow embryos and subsequent growth and survival. *Condor* **88**: 1-10.
Zacharias, V.J. & Gaston, A.J. (1999). The recent distribution of endemic, disjunct and globally uncommon birds in the forests of Kerala State, south-west India. *Bird Conserv. Int.* **9(3)**: 191-225.
Zahavi, A. (1971). The social behaviour of the White Wagtail *Motacilla alba alba* wintering in Israel. *Ibis* **113(2)**: 203-211.
Zamora, R. (1990). Seasonal variation of a passerine community in a Mediterranean high-mountain. *Ardeola* **37**: 219-228.
Zang, H. & Suedbeck, P. (2000). The situation of Crested Lark *Galerida cristata* in Lower Saxony, NW Germany. *Vogelwelt* **121(4)**: 173-181.
Zapata, A.R.P. (1967). Observaciones sobre aves de Puerto Deseado, Provincia de Santa Cruz. *Hornero* **10**: 351-378.
Zapata, A.R.P. & Martínez, H.S. (1972). Algunas aves no citadas y otras poco frecuentes para el sur de la provincia de Buenos Aires. *Acta Zool. Lilloana* **29**: 181-199.
Zhang Cizu, Zhu Xiang & Pang Bingzhang (1997). *Birds of China*. China Forestry Publishing House, Beijing.
Zhang, L., Brooks, D.R. & Causey, D. (2003). Two species of *Acuaria* Bremser, 1811 (Nematoda: Acuarioidea: Acuariidae) in passerine birds from the Area de Conservación Guanacaste, Costa Rica. *J. Parasitol.* **89**: 1039-1043.
Zhang Shoufu, Zhang Shoulin *et al.* (1989). [Banding of the Red-rumped Swallow *Hirundo daurica*]. *Chinese J. Zool.* **24(5)**: 56-57. In Chinese.
Zhang Wenguang (1982). [Observations on the breeding habits of the Short-toed Lark *Calandrella cinerea*]. *Chinese J. Zool.* **17(4)**: 17-18. In Chinese.
Zhang Xiaoai & Deng Heli (1992). [Breeding biology of Yellow-headed Wagtails: incubation and parental care]. *Acta Biol. Plateau Sinica* **11**: 55-61. In Chinese with English summary.
Zhao Liang, Zhang Xiaoai & Li Laixing (2002). [Incubating behavior of the Horned Lark (*Eremophila alpestris*) and Small Skylark (*Alauda gulgula*)]. *Acta Zool. Sinica* **48(5)**: 695-699.
Zhao Zhengjie (2001). [*A Handbook of the Birds of China*]. Vol. 2. Passerines. Jilin Science & Technology Press, Changchun, China. In Chinese.
Zheng Baolai ed. (1985). *Fauna Sinica. Aves*. Vol. 8. Passeriformes (Eurylaimidae-Irenidae). Science Press, Beijing.
Zheng Guangmei & Zhang Cizu (2002). *Birds in China*. China Forestry Publishing House, Beijing, China.
Zheng Shengwu (1984). On the growth of nestlings of the Horned Lark (*Eremophila alpestris elwesi*). *Acta Biol. Plateau Sinica* **2**: 75-80.
Zielinski, P. & Banbura, J. (1995). Selfish behavior of juvenile Barn Swallows (*Hirundo rustica*) intruding in active nests. *Ornis Fenn.* **72**: 89-90.
Zielinski, P. & Banbura, J. (1998). Egg size variation in the Barn Swallow *Hirundo rustica*. *Acta Ornitologica* **33(3-4)**: 191.
Zimmer, J.T. (1930). *Birds of the Marshall Field Peruvian Expedition, 1922-1923*. Publications of the Field Museum of Natural History (Zoological Series) **282, pt. 17(7)**. 480 pp.
Zimmer, J.T. (1936a). Studies of Peruvian birds 23. Notes on *Doliornis*, *Pipreola*, *Attila*, *Laniocera*, *Rhytipterna*, and *Lipaugus*. *Amer. Mus. Novit.* **893**: 1-15.

Zimmer, J.T. (1936b). Studies of Peruvian birds 24. Notes on *Pachyramphus*, *Platypsaris*, *Tityra*, and *Pyroderus*. *Amer. Mus. Novit.* **894**: 1-26.
Zimmer, J.T. (1937a). Studies of Peruvian birds 26. Notes on the genera *Agriornis*, *Muscisaxicola*, *Myotheretes*, *Ochthoeca*, *Colonia*, *Knipolegus*, *Phaeotriccus*, *Fluvicola*, and *Ramphotrigon*. *Amer. Mus. Novit.* **930**: 1-27.
Zimmer, J.T. (1937b). Studies of Peruvian birds 27. Notes on the genera *Muscivora*, *Tyrannus*, *Empidonomus*, and *Sirystes*, with further notes on *Knipolegus*. *Amer. Mus. Novit.* **962**: 1-28.
Zimmer, J.T. (1937c). Studies of Peruvian birds 28. Notes on the genera *Myiodynastes*, *Conopias*, *Myiozetetes*, and *Pitangus*. *Amer. Mus. Novit.* **963**: 1-28.
Zimmer, J.T. (1938). Studies of Peruvian birds 29. Notes on the genera *Myiarchus*, *Mitrephanes*, and *Cnemotriccus*. *Amer. Mus. Novit.* **994**: 1-32.
Zimmer, J.T. (1939a). Studies of Peruvian birds 30. Notes on the genera *Contopus*, *Empidonax*, *Terenotriccus*, and *Myiobius*. *Amer. Mus. Novit.* **1042**: 1-13.
Zimmer, J.T. (1939b). Studies of Peruvian birds 31. Notes on the genera *Myiotriccus*, *Pyrrhomyias*, *Myiophobus*, *Onychorhynchus*, *Platyrinchus*, *Cnipodectes*, *Sayornis*, and *Nuttallornis*. *Amer. Mus. Novit.* **1043**: 1-15.
Zimmer, J.T. (1939c). Studies of Peruvian birds 33. The genera *Tolmomyias* and *Rhynchocyclus*. *Amer. Mus. Novit.* **1045**: 1-23.
Zimmer, J.T. (1940a). Studies of Peruvian birds 34. The genera *Todirostrum*, *Euscarthmornis*, *Snethlagea*, *Poecilotriccus*, *Lophotriccus*, *Myiornis*, *Pseudotriccus*, and *Hemitriccus*. *Amer. Mus. Novit.* **1066**: 1-23.
Zimmer, J.T. (1940b). Studies of Peruvian birds 35. Notes on the genera *Phylloscartes*, *Euscarthmus*, *Pseudocolopteryx*, *Tachuris*, *Spizitornis*, *Yanacea*, *Uromyias*, *Stigmatura*, *Serpophaga*, and *Mecocerculus*. *Amer. Mus. Novit.* **1095**: 1-19.
Zimmer, J.T. (1941a). Studies of Peruvian birds 36. Notes on the genera *Elaenia* and *Myiopagis*. *Amer. Mus. Novit.* **1108**: 1-23.
Zimmer, J.T. (1941b). Studies of Peruvian birds 37. The genera *Sublegatus*, *Phaeomyias*, *Camptostoma*, *Xanthomyias*, *Phyllomyias*, and *Tyranniscus*. *Amer. Mus. Novit.* **1109**: 1-25.
Zimmer, J.T. (1941c). Studies of Peruvian birds 38. The genera *Oreotriccus*, *Tyrannulus*, *Acrochordopus*, *Ornithion*, *Leptopogon*, *Mionectes*, *Pipromorpha*, and *Phyrocephalus*. *Amer. Mus. Novit.* **1126**: 1-25.
Zimmer, J.T. (1953). Studies of Peruvian birds 65. The jays (Corvidae) and pipits (Motacillidae). *Amer. Mus. Novit.* **1649**: 1-27.
Zimmer, J.T. (1955a). Studies of Peruvian birds 66. The swallows (Hirundinidae). *Amer. Mus. Novit.* **1723**: 1-36.
Zimmer, J.T. (1955b). Further notes on tyrant flycatchers (Tyrannidae). *Amer. Mus. Novit.* **1749**: 1-24.
Zimmer, J.T. & Phelps, W.H. (1944). New species and subspecies of birds from Venezuela. Part 1. *Amer. Mus. Novit.* **1270**: 1–16.
Zimmer, K.J. (1985). *The Western Bird Watcher*. Prentice Hall, Engelwood Cliffs, New Jersey.
Zimmer, K.J. & Hilty, S.L. (1997). Avifauna of a locality in the upper Orinoco drainage of Amazonas, Venezuela. Pp. 865-885 in: Remsen (1997).
Zimmer, K.J. & Whittaker, A. (2000). Species limits in Pale-tipped Tyrannulets (*Inezia*: Tyrannidae). *Wilson Bull.* **112(1)**: 51-66.
Zimmer, K.J. & Whittaker, A. (2004). Observations on the vocalizations and behavior of the Black-chested Tyrant (*Taeniotriccus andrei*) from the Carajás region of Pará, Brazil. *Cotinga* **22**.
Zimmer, K.J., Parker, D.A., Isler, M.L. & Isler, P.R. (1997). Survey of a southern Amazonian avifauna: the Alta Floresta region, Mato Grosso, Brazil. Pp. 887-918 in: Remsen (1997).
Zimmer, K.J., Whittaker, A. & Oren, D.C. (2001). A cryptic new species of flycatcher (Tyrannidae: *Suiriri*) from the Cerrado region of central South America. *Auk* **118(1)**: 56-78.
Zimmerman, D.A. (1972). *The Avifauna of the Kakamega Forest, Western Kenya, Including a Bird Population Study*. Bulletin of the American Museum of Natural History **149(3)**, New York. 83 pp.
Zimmerman, D.A. (1978a). A probable Nutting's Flycatcher in southwestern New Mexico. *Western Birds* **9**: 135-136.
Zimmerman, D.A. (1978b). Mascarene Martins in Kenya. *Scopus* **2(3)**: 74-75.
Zimmerman, D.A., Turner, D.A. & Pearson, D.J. (1996). *Birds of Kenya and Northern Tanzania*. Christopher Helm, London.
Zink, G. (1969). The migrations of European Swallows *Hirundo rustica* to Africa from data obtained through ringing in Europe. *Ostrich* **8**(Suppl.): 213-222.
Zink, G. (1973-1985). *Der Zug Europäischer Singvögel. Ein Atlas der Wiederfunde Beringter Vögel*. Vols. 1-4. Vogelzug-Verlag, Möggingen, Germany.
Zink, R.M. & Johnson, N.K. (1984). Evolutionary genetics of flycatchers. I. Sibling species in the genera *Empidonax* and *Contopus*. *Syst. Zool.* **33**: 205-216.
Zink, R.M., Rohwer, S., Andreev, A.V. & Dittmann, D.L. (1995). Trans-Beringia comparisons of mitochrondrial DNA differentiation in birds. *Condor* **97**: 639-649.
Zinner, D. (2001). Ornithological notes from a primate survey in Eritrea. *Bull. African Bird Club* **8(2)**: 95-106.
Zotta, A.R. (1936). Sobre el contenido estomacal de aves argentinas. *Hornero* **6**: 261-270.
Zotta, A.R. (1940). Lista sobre el contenido estomacal de las aves argentinas. *Hornero* **7**: 402-411.
Zou Fasheng, Song Xiajun, Hu Huijian & Jiang Haisheng (2000). The preliminary results on survey of avian resources on Hainan Island. Pp. 311-321 in: Anon. (2000d).
Zusi, R.L. (1978). Remarks on the generic allocation of *Pseudochelidon sirintarae*. *Bull. Brit. Orn. Club* **98(1)**: 13-15.
Zusi, R.L. (1985). Muscles of the neck, trunk and tail in the Noisy Scrub-bird, *Atrichornis clamosus*, and Superb Lyrebird, *Menura novaehollandiae* (Passeriformes: Atrichornithidae and Menuridae). *Records Austr. Mus.* **37(3-4)**: 229-242.
Zyskowski, K., Robbins, M.B., Townsend, A., Bostwick, K.S., Clay, R.P. & Amarilla, L.A. (2003). Avifauna of the northern Paraguayan Chaco. *Orn. Neotropical* **14(2)**: 247-262.

Recordings used in preparation of Voice subsections of species accounts

Anon. (1995). Unpublished recordings of the family Alaudidae. Percy Fitzpatrick Sound Library, National Flagship Institution, Pretoria, South Africa.
Chappuis, C. (2000). *African Bird Sounds*. 15 Vols. Societé Ornithologique de France & The British Library National Sound Archive, Paris & London.
Coopmans, P. (1994). Unpublished audio recordings of Santa Marta Bush-Tyrant, in Colombia, 2-3 January. Library of Natural Sounds, Cornell Laboratory of Ornithology, Cornell University, Ithaca, New York.
Gibbon, G. (1991). *Southern African Bird Sounds*. 6 cassettes.
Parker, T.A. (1977). Unpublished audio recordings of Tumbes Tyrant, in Peru, 23 and 28 September. Library of Natural Sounds, Cornell Laboratory of Ornithology, Cornell University, Ithaca, New York.
Parker, T.A. (1980). Unpublished audio recordings of Tumbes Tyrant, in Peru, 7 June. Library of Natural Sounds, Cornell Laboratory of Ornithology, Cornell University, Ithaca, New York.
Parker, T.A. (1983). Unpublished audio recordings of *Myiophobus ochraceiventris*, in Peru. Library of Natural Sounds, Cornell Laboratory of Ornithology, Cornell University, Ithaca, New York.
Parrini, R. (2004). Unpublished tape recording of *Hemitriccus mirandae*. Parrini personal collection.
Roché, J.C. & Chevereau, J. (1998). *Birds of North-West Africa. Oiseaux du Maghreb*. Sittelle, Le Verdier, France.
Ryan, P., Lloyd, P., Cohen, C., Barnes, K. *et al.* (2004). Unpublished audio recordings of the family Alaudidae.
Schulenberg, T.S. (1987a). Unpublished audio recordings of *Myiophobus ochraceiventris*, in Peru. Library of Natural Sounds, Cornell Laboratory of Ornithology, Cornell University, Ithaca, New York.
Schulenberg, T.S. (1987b). Unpublished audio recordings of *Myiophobus roraimae*, in Ecuador and Peru. Library of Natural Sounds, Cornell Laboratory of Ornithology, Cornell University, Ithaca, New York.
Straneck, R. (1999a). *Canto de las Aves Patagónicas*. Cassette. Literature of Latin America, Buenos Aires.
Straneck, R. (1999b). *Canto de las Aves de las Serranías Centrales-CC*. Cassette. Literature of Latin America, Buenos Aires.
Walker, B. (1999). Unpublished audio recordings of Tumbes Tyrant, in Quebrada Frijolito and Limon, Lambayeque, Peru, and Piura Chat-Tyrant, in Abra Porcilla (1900m), Lambayeque, Peru.
Whitney, B.M. (1987). Unpublished audio recordings of Strange-tailed Tyrant, in Argentina, 26 December. Library of Natural Sounds, Cornell Laboratory of Ornithology, Cornell University, Ithaca, New York.

INDEX

INDEX

Numbers in *italics* refer to the page numbers of individual photographs.

A

abbotti, Hirundo tahitica 667
abditivus, Manacus manacus 157
abdominalis, Mionectes oleagineus 309
absita, Myiopagis caniceps 265
Abyssinian Bushlark 559
Abyssinian Lark 559
Abyssinian Longclaw *742*, 773
abyssinica, Cecropis 603, 676
Acadian Flycatcher *180*, 359
Acanthisitta 472
ACANTHISITTIDAE 464, 472
accola, Myiopagis viridicata 266
acer, Zimmerius gracilipes 297
Acrochordopus 259
acrolophites, Schiffornis turdina 168
actia, Eremophila alpestris 589
actiosus, Myiarchus panamensis 433
acutipennis, Pseudocolopteryx 289
acutirostris, Calandrella 585
adamsi, Calandrella raytal 586
adastus, Empidonax traillii 360
adendorffi, Mirafra apiata 552
adjacens, Myiobius atricaudus 352
adusta, Eremophila alpestris 589
aenea, Schiffornis turdina 168
aenigma, Elaenia 269
aenigma, Hemitriccus 324
aenigma, Sapayoa 111, 167
aequalis, Stelgidopteryx ruficollis 662
aequatorialis, Anairetes parulus 282
aequatorialis, Petrochelidon rufocollaris 685
aequatorialis, Rupicola peruvianus 107
aequatorialis, Tolmomyias sulphurescens 338
aequinoctialis, Rhynchocyclus olivaceus 337
aethiopica, Hirundo 668
affinis, Empidonax 363
affinis, Eremopterix nigriceps 572
affinis, Lophotriccus vitiosus 318
affinis, Mirafra 543
affinis, Suiriri suiriri 276
African Barn Swallow 666
African Mosque Swallow 677
African Pied Wagtail *693*, *715*, *729*, 779
African Pipit 746
African River Martin *609*, 641
African Rock Martin 673
African Rock Pipit 756
African Sand Martin 647
African Short-toed Lark 583
African Singing Bushlark 545
African Swallow 666
African Wagtail 779
African Wire-tailed Swallow 668
africana, Mirafra 521, *523*, *526*, 551
africanoides, Calendulauda 558
Agile Tit-tyrant 282
agilis, Anairetes 282
aglaiae, Pachyramphus 460
agraphia, Anairetes 283
Agriornis 395
aguimp, Motacilla 693, *715*, *729*, 779
aguirrei, Galerida theklae 596
Agulhas Clapper Lark 552
Agulhas Long-billed Lark 565
aharonii, Calandrella rufescens 585
aithalodes, Contopus cinereus 369
akeleyi, Ammomanes deserti 578
Alaemon 567
Alagoas Tyrannulet 301
alakulensis, Motacilla flava 781
alascensis, Empidonax alnorum 360
alascensis, Motacilla flava 781
alaschanica, Galerida cristata 595
Alaska Wagtail 781
Alaska Yellow Wagtail 781
Alauda 598
ALAUDIDAE 496, 543
alaudipes, Alaemon 502, *512*, 567
alba, Motacilla 694, *706*, *708*, *710*, *713*, *722*, *739*, 777
Albert's Lyrebird *489*, *493*, 494
alberti, Menura 489, *493*, 494
albescens, Calendulauda 560
albescens, Hirundo tahitica 667
albicauda, Agriornis andicola 395
albicauda, Mirafra 545
albiceps, Elaenia 268
albiceps, Psalidoprocne 643
albicollis, Legatus leucophaius 406
albidiadema, Ochthoeca frontalis 381
albidiventer, Leptopogon superciliaris 307
albidus, Anthus rufulus 746
albifacies, Poecilotriccus 330
albifrons, Eremopterix nigriceps 572
albifrons, Muscisaxicola 193, 400
albigula, Eremophila alpestris 589
albigularis, Empidonax 361
albigularis, Hirundo 633, 667
albigularis, Zimmerius chrysops 297
albilinea, Tachycineta 651
albilora, Muscisaxicola 401
albimarginatus, Myiarchus swainsoni 432
albinucha, Xenopsaris 453
albitorques, Tityra inquisitor 449
albiventer, Fluvicola 195, 388
albiventer, Tachycineta 607, *616*, 652
albiventris, Anairetes reguloides 281
albiventris, Myiornis 316
albiventris, Pachyramphus aglaiae 460
albivertex, Elaenia chiriquensis 272
albocaudatus, Mecocerculus stictopterus 279
albocinereus, Sirystes sibilator 427
albofasciata, Chersomanes 518, 564
albogriseus, Pachyramphus 459
albogriseus, Sirystes sibilator 427
albogularis, Contopus 371
albogularis, Platyrinchus mystaceus 341
albogularis, Tyrannus 419
alboides, Motacilla alba 777
albovittatus, Conopias 411
albula, Motacilla alba 777
albus, Procnias 55, 105
Alder Flycatcher 360
Alectrurus 388
alexanderi, Galerida cristata 595
algeriensis, Ammomanes deserti 577
algida, Certhilauda semitorquata 565
algoensis, Mirafra apiata 552
aliena, Mirafra javanica 543
Allocotopterus 159
alluvia, Calandrella cinerea 584
Almirante Manakin 156
alnorum, Empidonax 360
alopex, Calendulauda 559
Alopochelidon 662
alpestris, Eremophila 513, *516*, 589
alpina, Eremophila alpestris 589
Alpine Pipit 758
Alpine Rifleman 472
alpinus, Anairetes 281
alpinus, Muscisaxicola 401
altanus, Macronyx ameliae 774
altera, Alaemon hamertoni 567
altera, Corapipo leucorrhoa 155
alticola, Alauda arvensis 598
alticola, Anthus rubescens 767
alticola, Chersomanes albofasciata 564
alticola, Elaenia cristata 271
alticola, Tachuris rubrigastra 315
altirostris, Galerida cristata 595
amabilis, Cotinga 93
amacurense, Todirostrum maculatum 333
amadoni, Hirundo aethiopica 668
amaurocephalus, Leptopogon 231, 307
amazona, Schiffornis turdina 168
Amazonian Black-tyrant 377
Amazonian Royal Flycatcher 345
Amazonian Scrub-flycatcher 311
Amazonian Tyrannulet 312
Amazonian Umbrellabird 102
amazonicus, Myiobius barbatus 351
amazonicus, Platyrinchus platyrhynchos 342
amazonus, Capsiempis flaveola 287
amazonus, Mionectes macconnelli 310
amazonus, Pachyramphus castaneus 455
amazonus, Terenotriccus erythrurus 352
ambiens, Hirundo tahitica 667
ambigua, Hirundo albigularis 668
ambigua, Hirundo rustica 665
ameliae, Macronyx 702, *715*, 774
American Barn Swallow 665
American Cliff Swallow 683
American Pipit 767
American Rock Pipit 767
American Water Pipit 767
amitinus, Manacus vitellinus 156
Ammomanes 577
Ammomanopsis 563
ammophila, Eremophila alpestris 589
amnicola, Sayornis nigricans 373
Ampelioides 84
Ampelion 74
ampliformis, Cecropis abyssinica 676
amplus, Contopus sordidulus 368
Amur Wagtail 777
Anairetes 280
anchietae, Mirafra africana 551
Andean Cliff Swallow 660
Andean Cock-of-the-rock *35*, *47*, *58*, *59*, *60*, *67*, 107
Andean Laniisoma 76
Andean Negrito 375
Andean Rufous-backed Negrito 375
Andean Swallow 660
Andean Tyrant 377
andecola, Agriornis micropterus 396
andecola, Haplochelidon 660
anderssoni, Calandrella cinerea 583
anderssoni, Ptyonoprogne fuligula 673
andicola, Agriornis 254, 395
andinus, Hemitriccus granadensis 327
andinus, Hymenops perspicillatus 375
andrei, Taeniotriccus 328
Andrew's Swallow 644
andrewi, Hirundo 644
angarensis, Motacilla flava 781
Angola Bushlark 551
Angola Cliff Swallow 681
Angola Lark 551
Angolan Rock Swallow 681
Angolan Swallow 666
Angolan Wagtail 784
angolensis, Anthus lineiventris 755
angolensis, Hirundo 666
angolensis, Mirafra 551
angustifasciata, Ochthoeca cinnamomeiventris 382
angustirostris, Phylloscartes ventralis 299
angustirostris, Phytotoma rutila 74
angustirostris, Sayornis nigricans 373
ankarae, Galerida cristata 595
annae, Ammomanes deserti 578
annae, Anthus cinnamomeus 746
annectens, Pseudotriccus pelzelni 290
annectens, Todirostrum maculatum 333
anomala, Pipra 143, 161
Anomalous Manakin 143, 161
ansorgei, Anthus leucophrys 753
ansorgei, Calendulauda sabota 558
antarcticus, Anthus 741, 760
anthoides, Corythopis torquatus 293
anthracina, Dixiphia pipra 151
anthracinus, Knipolegus aterrimus 379
Anthus 745
antillarum, Myiarchus 440
Antillean Elaenia 273
Antilophia 151
antinorii, Psalidoprocne pristoptera 644
Antioquia Bristle-tyrant 305
antioquiae, Ampelion rufaxilla 75
antioquiae, Machaeropterus striolatus 159
antioquiae, Piprites chloris 167
Antonia's Cotinga 98
antoniae, Carpodectes 98
antonii, Mirafra angolensis 551
Antpipit
  Delalande's Antpipit 293
  Ringed *177*, 293
  Southern 293
apetzii, Calandrella rufescens 586
Aphanotriccus 355
aphracta, Stelgidopteryx serripennis 661
aphrasta, Eremophila alpestris 589
apiata, Mirafra 552
Apical Flycatcher 434
apicalis, Myiarchus 434
apolites, Tyrannus 419
aprica, Hirundo 602
aprophata, Petrochelidon pyrrhonota 683
apuliae, Galerida cristata 595
aquatica, Sayornis nigricans 373
arabica, Ptyonoprogne fuligula 673
arabicus, Anthus similis 749
araguayae, Serpophaga 285
aralensis, Motacilla flava 781
Araripe Manakin *141*, 151
arborea, Lullula 515, *529*, 600
arboricola, Progne subis 655
Archer's Lark 557
Archer's Long-clawed Lark 557
archeri, Heteromirafra 557
arcticincta, Hirundo angolensis 666
arcticola, Eremophila alpestris 589
arcuata, Pipreola 80
ardens, Pyrocephalus rubinus 374
ardosiacus, Contopus fumigatus 368
arenaria, Chersomanes albofasciata 564
arenarum, Sublegatus 310
arenicola, Galerida cristata 595
arenicolor, Ammomanes cinctura 577
arequipae, Anairetes flavirostris 281
argalea, Eremophila alpestris 589
argentina, Muscisaxicola cinereus 400
argentinus, Lathrotriccus euleri 354
argentinus, Pitangus sulphuratus 409
aridula, Calendulauda burra 559
ariel, Petrochelidon 682
Aristida Lark 560
Arkansas Kingbird 422
armenica, Alauda arvensis 598
arorihensis, Mirafra gilletti 553
artemisiana, Calandrella brachydactyla 583
Arundinicola 388
arvensis, Alauda 519, *522*, *532*, 598
asbenaicus, Anthus similis 749
ascensi, Macronyx fuellebornii 773
asemus, Tolmomyias sulphurescens 338
Ash's Bushlark 547
Ash's Lark 547
Ash-breasted Tit-tyrant 281
Ash-coloured Tyrannulet 294

Ash-throated Casiornis 428
Ash-throated Flycatcher *214*, *234*, 437
ashi, Mirafra 547
Ashy-crowned Finch-lark 574
Ashy-crowned Sparrow-lark *520*, 574
Ashy-headed Tyrannulet 262
Ashy-headed Wagtail 781
Asian Grey Short-toed Lark 585
Asian House Martin 675
Asian Martin 675
Asian Short-toed Lark 585, 586
Asian Wire-tailed Swallow 668
Asiatic Calandra Lark 580
Asiatic Lark 580
asmaraensis, Calandrella erlangeri 584
assabensis, Ammomanes deserti 578
assamica, Mirafra 544
assimilis, Mionectes oleagineus 309
assimilis, Pyrrhomyias cinnamomeus 353
assimilis, Tolmomyias 339
Atalotriccus 318
aterrimus, Knipolegus 219, 379
athensis, Calandrella somalica 585
athertonensis, Mirafra javanica 543
Athi Lark 585
Athi Short-toed Lark 585
athi, Mirafra africana 551
atimastus, Sirystes sibilator 427
Atlantic Royal Flycatcher 345
atlantica, Chiroxiphia pareola 152
atlas, Eremophila alpestris 589
atra, Tijuca 48, *50*, 90
atricapillus, Myiornis 316
atricaudus, Myiobius 352
atriceps, Empidonax 365
atriceps, Myiarchus tuberculifer 432
Atrichornis 482
ATRICHORNITHIDAE 474, 482
atripennis, Fluvicola nengeta 388
atrirostris, Sublegatus arenarum 310
atrocaerulea, Hirundo 639, 670
atronitens, Xenopipo 117, 160
atropurpurea, Xipholena 97
Atticora 660
Attila 444
Attila
  Bright-rumped 445
  Cinnamon 444
  Citron-bellied 444
  Dull-capped 445
  Grey-headed 444
  Grey-hooded *185*, 445
  Grey-throated 445
  Ochraceous 444
  Polymorphic 445
  Rufous 445
  Rufous-tailed 444
  Streaked 445
  White-eyed 445
  White-winged 445
aucklandicus, Anthus novaeseelandiae 745
audax, Aphanotriccus 355
audax, Pachyramphus validus 462
aurantiacus, Manacus 116, 156
aurantiicollis, Pipra aureola 143
aurantiigula, Macronyx 773
aurantiiventris, Mitrephanes phaeocercus 371
aurantiivertex, Heterocercus 117, 162
aurantioatrocristatus, Griseotyrannus 416
aureatus, Myiobius sulphureipygius 351
aureiventris, Myiotriccus ornatus 315
aureola, Pipra 136, 143
aureopectus, Machaeropterus striolatus 159
aureopectus, Pipreola 83
aureus, Phyllomyias nigrocapillus 261
auriceps, Myiophobus fasciatus 348
auricularis, Myiornis 187, 315
aurifrons, Neopelma 165
aurulentus, Tolmomyias flaviventris 340
austinrobertsi, Calendulauda africanoides 558
Austral Negrito *201*, 375
Australasian Bushlark 543
Australasian Lark 543
Australasian Pipit *690*, *719*, 745
Australian Pipit 745
Australian Tree Martin 683
australis, Alauda gulgula 599
australis, Anthus novaeseelandiae 745
australis, Empidonax albigularis 361
australis, Eremopterix 534, 571
australis, Myiarchus ferox 434
australis, Pachyramphus major 460
australis, Tyranniscus 260
australoabyssinica, Calendulauda poecilosterna 558
australoabyssinicus, Anthus caffer 768
austroriparius, Poecilotriccus latirostris 331
auyantepui, Elaenia dayi 273
auyantepui, Hemitriccus margaritaceiventer 324
averano, Procnias 38, *66*, 105
azizi, Ammomanes deserti 578

B

baddeleyi, Chersomanes albofasciata 564
badia, Cecropis 678
badius, Pachyramphus cinnamomeus 455
Bahama Flycatcher 439
Bahama Swallow 651
bahamensis, Contopus caribaeus 370
bahamensis, Tyrannus caudifasciatus 424
Bahia Tyrannulet 299
bahiae, Myiarchus tyrannulus 438
bahiae, Stigmatura napensis 294
bahiae, Suiriri suiriri 276
baicalensis, Motacilla alba 777
Baird's Flycatcher 413
bairdi, Empidonax affinis 363
bairdii, Myiodynastes 413
balcanica, Eremophila alpestris 589
balsaci, Galerida cristata 595
Bamboo Flatbill 443
Bamboo-tyrant
  Brown-breasted 321
  Drab-breasted 321
  Flammulated 322
bamendae, Mirafra africana 551
bamingui, Psalidoprocne pristoptera 643
Bananal Tyrannulet 265
Band-tailed Fruiteater 80
Band-tailed Manakin 143
Banded Cotinga 94
Banded Martin *628*, 649
Banded Sand Martin 649
bangsi, Manacus manacus 157
Bank Swallow 647
Bannerman's Pipit 749
bannermani, Anthus similis 749
bannermani, Cecropis abyssinica 676
bansoensis, Ptyonoprogne fuligula 673
Bar-tailed Desert Lark 577
Bar-tailed Lark *511*, 552, 577
Bar-tailed Sand Lark 577
barbadensis, Elaenia martinica 267
barbatus, Myiobius 233, 351
barbirostris, Myiarchus 431
bardus, Rhynchocyclus olivaceus 337
Bare-necked Fruitcrow *45*, 99
Bare-necked Umbrellabird *57*, *62*, 102
Bare-throated Bellbird *50*, *51*, *53*, 105
Barlow's Lark *497*, 560
barlowi, Calendulauda 497, 560
barlowi, Chersomanes albofasciata 564
barlowi, Spizocorys conirostris 591
Barn Swallow *604*, *610*, *617*, *631*, 665
Barred Becard 454
Barred Fruiteater 80
batesi, Mirafra africana 551
bathoeni, Chersomanes albofasciata 564
Bay-ringed Tyrannulet 302
Bay-vented Cotinga 75
Bearded Bellbird *38*, *66*, 105
Bearded Flycatcher 351
Bearded Manakin 157
Bearded Tachuri *250*, 288
Beardless Flycatcher 275
beaulieui, Mirafra javanica 543
Becard
  Barred 454
  Black-and-white 459
  Black-capped 459
  Chestnut-crowned *245*, 455
  Cinereous 455
  Cinnamon 455
  Crested 461
  Glossy-backed 460
  Green-backed *186*, 453
  Grey-collared 459
  Jamaican 461
  Mexican 459
  One-coloured 461
  Pink-throated 461
  Plain 461
  Reed 453
  Rose-throated 460
  Slaty 454
  White-winged *243*, 456
  Yellow-cheeked 453
beckeri, Phylloscartes 299
beema, Motacilla flava 781
Beesley's Lark 564
beesleyi, Chersomanes 564
beicki, Calandrella rufescens 586
beirensis, Motacilla capensis 784
Bellbird
  Bare-throated *50*, *51*, *53*, 105
  Bearded *38*, *66*, 105
  Three-wattled *56*, 104
  White *55*, 105
bellicosa, Hirundinea ferruginea 353
bellus, Masius chrysopterus 155
bellus, Myiophobus pulcher 347
Belted Flycatcher 356
Bengal Bushlark 544
Benguela Long-billed Lark *496*, 566
benguelensis, Certhilauda 496, 566
beniensis, Cnemotriccus fuscatus 356
benii, Tyrannulus elatus 262
bensoni, Ammomanes deserti 577
Bent-billed Flycatcher 316
Bentbill
  Grey-throated 316
  Northern 316
  Southern 317
berezowskii, Anthus hodgsoni 764
berlepschi, Conopias trivirgatus 411
berlepschi, Mitrephanes phaeocercus 371
berlepschi, Ochthoeca fumicolor 383
berlepschi, Pipra erythrocephala 144
berlepschi, Pseudotriccus pelzelni 290
berlepschi, Tolmomyias sulphurescens 338
berlepschii, Myiarchus oberi 440
Berryeater
  Black-headed *70*, 79
  Hooded *41*, 79
Berthelot's Pipit 755
berthelotii, Anthus 755
bicolor, Tachycineta 613, *637*, 649
bicornis, Eremophila alpestris 589
Bifasciated Lark 567
bifasciatus, Platyrinchus mystaceus 341
bilbali, Anthus novaeseelandiae 745
bilopha, Eremophila 500, 590
bimaculata, Melanocorypha 517, 579
Bimaculated Lark *517*, 579
bimaculatus, Cnemotriccus fuscatus 356
Bird-of-paradise
  New South Wales 495
birwae, Ptyonoprogne fuligula 673
bistriatus, Anthus novaeseelandiae 745
Black Lark *502*, 581
Black Manakin *117*, 160
Black Phoebe 373
Black Roughwing 643
Black Saw-wing *634*, 643
Black-and-gold Cotinga *48*, *50*, 90
Black-and-rufous Swallow 670
Black-and-white Becard 459
Black-and-white Monjita *254*, 394
Black-and-white Swallow 645
Black-and-white Tody-flycatcher 330
Black-and-white Tody-tyrant 330
Black-backed Tody-flycatcher 333
Black-backed Wagtail 777
Black-backed Water-tyrant *195*, 388
Black-bellied Finch-lark 574
Black-bellied Sparrow-lark 574
Black-billed Flycatcher 355
Black-billed Ground-tyrant 395
Black-billed Shrike-tyrant *192*, 395
Black-capped Becard 459
Black-capped Flycatcher 365
Black-capped Manakin 167
Black-capped Piprites *140*, 167
Black-capped Pygmy-tyrant 316
Black-capped Swallow 660
Black-capped Tyrannulet 261
Black-chested Fruiteater 83
Black-chested Tyrant 328
Black-collared Swallow 660
Black-crested Tit-tyrant 280
Black-crowned Finch-lark 572
Black-crowned Monjita 393
Black-crowned Sparrow-lark *500*, *524*, 572
Black-crowned Tityra *220*, 449
Black-eared Finch-lark 571
Black-eared Sparrow-lark *534*, 571
Black-eared Wagtail 777
Black-faced Cotinga 98
Black-fronted Ground-tyrant 402
Black-fronted Tody-flycatcher 334
Black-fronted Tyrannulet 300
Black-headed Berryeater *70*, 79
Black-headed Fruiteater 80
Black-headed Tody-flycatcher 335
Black-headed Wagtail 781
Black-necked Red Cotinga *43*, 107
Black-tailed Desert Lark 577
Black-tailed Finch-lark 577
Black-tailed Flycatcher 352
Black-tailed Lark 577
Black-tailed Tityra 450
Black-tipped Cotinga 98
Black-tyrant
  Amazonian 377
  Blue-billed 378
  Caatinga 379
  Crested *238*, 379
  Hudson's 377
  Velvety *182*, 379
  White-winged *219*, 379
Black-vented Swallow 677
Blackish Chat-tyrant 382
Blackish Pewee 371
blakistoni, Anthus spinoletta 766
blancoi, Contopus latirostris 370
Blanford's Lark 584
Blanford's Saw-wing 643
Blanford's Short-toed Lark 584
blanfordi, Calandrella 584
blanfordi, Psalidoprocne pristoptera 644
blatteus, Pyrocephalus rubinus 374
blayneyi, Anthus caffer 768
Blue Cotinga 93, 94
Blue Manakin *114*, 153
Blue Saw-wing 643
Blue Swallow 670
Blue-and-white Swallow 659
Blue-backed Manakin *138*, 152
Blue-billed Black-tyrant 378
Blue-crowned Manakin *113*, *124*, 147
Blue-headed Wagtail 781
Blue-headed Yellow Wagtail 781
Blue-rumped Manakin 147
Bluish-crowned Fruiteater 83
Bluish-fronted Fruiteater 83
Blyth's Pipit 750
Boat-billed Flycatcher *247*, 415
Boat-billed Tody-tyrant 322
boavistae, Alaemon alaudipes 567
bocagei, Anthus cinnamomeus 746
boehmii, Anthus campestris 750
bogotense, Camptostoma obsoletum 275
bogotensis, Anthus 761
bogotensis, Contopus cinereus 369
bogotensis, Myiopagis gaimardii 265
bogotensis, Polystictus pectoralis 288
bohndorffi, Anthus leucophrys 753
bokermanni, Antilophia 141, 151
bolivari, Dixiphia pipra 151
Bolivian Plantcutter 74
Bolivian Tyrannulet 296
boliviana, Chiroxiphia 121, 153
boliviana, Ochthoeca frontalis 381
boliviana, Phibalura flavirostris 79
boliviana, Piprites chloris 167
bolivianum, Camptostoma obsoletum 275
bolivianum, Ramphotrigon megacephalum 443
bolivianus, Anairetes alpinus 281
bolivianus, Attila 445
bolivianus, Lathrotriccus euleri 354
bolivianus, Pitangus sulphuratus 409
bolivianus, Polioxolmis rufipennis 391
bolivianus, Zimmerius 296
Borba Tody-flycatcher 330
borbae, Pipra aureola 143
borbae, Tolmomyias flaviventris 340
borbonica, Phedina 645
borealis, Contopus 367
boreus, Myiarchus crinitus 437
borosi, Ammomanes deserti 577
Botha 592
Botha's Lark *540*, 592
boweni, Chersomanes albofasciata 564
brachydactyla, Calandrella 503, *504*, *523*, 583
brachyptera, Elaenia chiriquensis 272
brachyptera, Tachycineta thalassina 650
brachyrhynchus, Contopus fumigatus 368
Brachystegia Pipit 748
brachytarsus, Contopus cinereus 369
brachyura, Galerida cristata 595
brachyurus, Anthus 768
brachyurus, Myiarchus tyrannulus 438
Bradfield's Lark 558
bradfieldi, Calendulauda sabota 558
bradfieldi, Chersomanes albofasciata 564
bradfieldi, Motacilla capensis 784
bradshawi, Certhilauda subcoronata 566
Bran-coloured Flycatcher *188*, 348
brandti, Eremophila alpestris 589
brasilianus, Anthus hellmayri 761
braziliensis, Tityra cayana 450
Brazza's Martin 645
Brazza's Swallow 645
brazzae, Phedina 645
brevicauda, Muscigralla 405
brevipennis, Polystictus pectoralis 288
brevirostris, Anthus furcatus 759
brevirostris, Certhilauda 565
brevirostris, Muscisaxicola flavinucha 400
brevirostris, Phyllomyias fasciatus 259
brevirostris, Rhynchocyclus 337
brevirostris, Sublegatus modestus 311
breweri, Hemitriccus margaritaceiventer 324
brewsteri, Empidonax traillii 360
Bright-rumped Attila 445
Bristle-tyrant
  Antioquia 305
  Chapman's 303
  Ecuadorian 300
  Marble-faced *174*, 304
  Otto's 304

Southern 304
Spectacled 304
Variegated 303
Venezuelan 305
Yellow-bellied 301
British Pied Wagtail 777
Broad-billed Manakin 167
Broad-billed Sapayoa *111*, 167
brodkorbi, Empidonax fulvifrons 365
Bronze-olive Pygmy-tyrant 290
brooksi, Oxyruncus cristatus 73
Brown Manakin 168
Brown Mourner 168
Brown Rock Pipit 749
Brown Roughwing 643
Brown Saw-wing 643
Brown Schiffornis 168
Brown Tree Pipit 765
Brown-backed Chat-tyrant 383
Brown-bellied Swallow 659
Brown-breasted Bamboo-tyrant 321
Brown-breasted Pygmy-tyrant 321
Brown-capped Tyrannulet 274
Brown-chested Martin *612*, 657
Brown-crested Flycatcher 438
Brown-throated Sand Martin 647
browni, Elaenia frantzii 272
Brownish Elaenia 271
Brownish Flycatcher 345
Brownish Twistwing 345
brunneicapillus, Contopus latirostris 370
brunneicapillus, Ornithion 274
brunneiceps, Myiarchus tuberculifer 432
brunneifrons, Ochthoeca fumicolor 383
brunneifrons, Terenotriccus erythrurus 352
brunneomarginatus, Mecocerculus leucophrys 280
brunnescens, Myiarchus ferox 434
buchanani, Ptyonoprogne fuligula 673
Buckley's Lark 552
Buckley's Mourner 76
buckleyi, Laniisoma elegans 76
buckleyi, Mirafra rufocinnamomea 552
buckleyi, Tityra inquisitor 449
bucolica, Galerida modesta 597
budytoides, Stigmatura 295
Buff-banded Tyrannulet 279
Buff-bellied Pipit 767
Buff-breasted Flycatcher 365
Buff-breasted Tody-tyrant 327
Buff-cheeked Tody-flycatcher 330
Buff-cheeked Tody-tyrant 330
Buff-throated Cotinga 87
Buff-throated Purpletuft *39*, *71*, 87
Buff-throated Tody-tyrant 328
Buffy Pipit 753
bunites, Phyllomyias burmeisteri 259
burleighi, Mitrephanes phaeocercus 371
burleighi, Stelgidopteryx serripennis 661
burmeisteri, Phyllomyias 259
Burmese Bushlark 544
burra, Calendulauda 528, *539*, 559
burzil, Anthus trivialis 765
Bush Lark 544
Bush Pipit 768
Bush Wren 473
Bush-tyrant
Jelski's 377
Red-rumped *191*, 390
Rufous-bellied 390
Rufous-webbed 391
Santa Marta 389
Smoky 390
Streak-throated 389
Bushlark
Abyssinian 559
African Singing 545
Angola 551
Ash's 547
Australasian 543
Bengal 544
Burmese 544
Ceylon 543
Cinnamon 552
Collared 553
Eastern 543
Eastern Singing 543
Fawn 558
Friedmann's 547
Horsfield's 543
Indian 543
Indian Red-winged 543
Indochinese 544
Jerdon's 543
Kordofan 546
Madagascar 545
Monotonous 546
Northern White-tailed 545
Nyiro 547
Red-winged 548
Rufous 547
Rufous-rumped 563
Rufous-winged 543, 544
Rusty 546
Rusty-winged 543
Short-clawed 566
Sidamo 557
Singing 543, 545
Somali 551
Somali Long-billed 548
Western Singing 545
White-tailed 545
Williams's 546
bushmanensis, Chersomanes albofasciata 564
Bushveld Pipit 768
buxtoni, Alauda arvensis 598

C

Caatinga Black-tyrant 379
cabanisi, Cnemotriccus fuscatus 356
cabanisi, Knipolegus signatus 377
cacabata, Stelgidopteryx ruficollis 662
cadwaladeri, Laniisoma elegans 76
caelestipileata, Lepidothrix coronata 147
Caenotriccus 290
caesius, Hemitriccus granadensis 327
caffer, Anthus 768
cajamarcae, Myiotheretes fumigatus 390
cajamarcae, Ochthoeca diadema 382
calamae, Pipra fasciicauda 143
calamae, Tolmomyias assimilis 339
Calandra Lark *526*, *535*, 579
calandra, Melanocorypha 526, *535*, 579
Calandrella 583
calcarata, Motacilla citreola 782
calcaratus, Anthus correndera 760
Calendula 598
Calendulauda 558
Calfbird 103
Callichelidon 651
callizonus, Xenotriccus 356
calopterus, Mecocerculus 280
calopterus, Poecilotriccus 333
calviniensis, Calendulauda albescens 560
Calyptura 87
Calyptura
Kinglet 87
camaroonensis, Anthus cinnamomeus 746
Cameroon Mountain Saw-wing 643
Cameroon Pipit 746
Cameroon Saw-wing 643
campbelli, Atrichornis clamosus 482
campestris, Anthus 714, 750
campestris, Empidonax traillii 360
Campo Suiriri Flycatcher 276
Camptostoma 275
Canarian Pipit 755
canariensis, Motacilla cinerea 785
Canary Islands Pipit 755
cancrominus, Platyrinchus 340
cancromus, Platyrinchus mystaceus 341
candei, Manacus 134, *135*, 156
candida, Mirafra 547
canescens, Contopus nigrescens 371
canescens, Pachyramphus homochrous 461
caniceps, Attila spadiceus 445
caniceps, Megarynchus pitangua 415
caniceps, Myiopagis 265
caniceps, Poecilotriccus latirostris 331
cantarella, Alauda arvensis 598
cantillans, Mirafra 545
Cape Clapper Lark 552
Cape Long-billed Lark 565
Cape Longclaw *692*, *721*, 772
Cape Verde Lark 600
Cape Verde Skylark 600
Cape Wagtail *723*, 784
capensis, Macronyx 692, *721*, 772
capensis, Motacilla 723, 784
capensis, Spizocorys sclateri 592
capistratus, Muscisaxicola 206, 402
capitalis, Aphanotriccus 355
capitalis, Poecilotriccus 330
Capsiempis 287
captus, Anthus similis 749
Capuchinbird *54*, 103
caquetae, Lepidothrix coronata 147
carbonata, Lepidothrix coronata 147
caribaeus, Contopus 370
caribbaeus, Myiarchus cephalotes 435
Caribbean Elaenia 267
Caribbean Martin 656
caripensis, Myiophobus flavicans 346
carnifex, Phoenicircus 106
carnobarba, Procnias averano 105
caroli, Galerida cristata 595
carolinae, Galerida theklae 596
Carpodectes 97
Carpornis 79
carteri, Hirundo neoxena 667
carthaginis, Galerida cristata 595
cashmeriense, Delichon dasypus 675
Casiornis 428
Casiornis
Ash-throated 428
Rufous *208*, 428
caspica, Motacilla cinerea 785
Cassin's Kingbird 421
castaneotinctus, Lipaugus unirufus 89
castaneus, Pachyramphus 245, 455
castelnaui, Onychorynchus coronatus 345
catamarcae, Anthus correndera 760
Cattle Tyrant *183*, *228*, 405
caucae, Camptostoma obsoletum 275
caucae, Phyllomyias griseiceps 261
caucasica, Galerida cristata 595
caucasicus, Anthus spinoletta 766
caucensis, Pitangus sulphuratus 409
caudacuta, Culicivora 251, 287
caudata, Chiroxiphia 114, 153
caudata, Inezia 312
caudifasciatus, Tyrannus 424
Cave Swallow 684
cavei, Calendulauda barlowi 560
cavicola, Petrochelidon fulva 684
cayana, Cotinga 35, 94
cayana, Tityra 450
cayanensis, Myiozetetes 200, 406
caymanensis, Elaenia martinica 267
caymanensis, Tyrannus caudifasciatus 424
cearae, Phyllomyias fasciatus 259
cearae, Todirostrum cinereum 334
ceciliae, Phylloscartes 301
Cecropis 675
centralasiae, Anthus richardi 745
centralasica, Ptyonoprogne rupestris 673
centralis, Ochthoeca rufipectoralis 382
centralis, Psalidoprocne nitens 643
cephaleucos, Dixiphia pipra 151
Cephalopterus 102
cephalotes, Myiarchus 435
Ceratotriccus 328
cerritus, Manacus 156
Certhilauda 565
cerula, Capsiempis flaveola 287
Cerulean-capped Manakin 147
cervinus, Anthus 712, *717*, *727*, *728*, 764
Ceylon Bushlark 543
Ceylon Finch-lark 574
Ceylon Swallow 677
ceylonensis, Mirafra affinis 543
chachapoyas, Pipreola riefferii 80
Chaco Pipit 760
Chaco Suiriri Flycatcher 276
chacoensis, Anthus 760
chadensis, Mirafra cantillans 545
chalybea, Progne 603, 656
chalybea, Psalidoprocne pristoptera 644
Chapada Flycatcher *217*, 276
Chapin's Pipit 748
chapini, Anthus similis 749
chapini, Mirafra africana 551
chapini, Motacilla clara 786
Chapman's Bristle-tyrant 303
Chapman's Fruiteater 83
Chapman's Tyrannulet 303
chapmani, Mecocerculus leucophrys 280
chapmani, Myiodynastes maculatus 414
chapmani, Petrochelidon rufocollaris 685
chapmani, Pogonotriccus 303
chathamensis, Anthus novaeseelandiae 745
Chat-tyrant
Blackish 382
Brown-backed 383
Chestnut-belted 382
Crowned 381
D'Orbigny's 383
Golden-browed 381
Jelski's *174*, 382
Maroon-belted 382
Patagonian 384
Piura 384
Rufous-breasted 382
Slaty-backed 382
White-browed 383
Yellow-bellied 381
Yellow-browed 381
cheesmani, Ammomanes deserti 578
cheleensis, Calandrella rufescens 586
chendoola, Galerida cristata 595
cheniana, Mirafra 547
Chepen Swallow 651
Cheramoeca 645
cherriei, Elaenia fallax 273
cherriei, Tolmomyias sulphurescens 338
Chersomanes 564
Chersophilus 568
chersophilus, Anthus nyassae 748
Chestnut-backed Finch-lark 571
Chestnut-backed Sparrow-lark 571
Chestnut-bellied Cotinga *34*, 75
Chestnut-belted Chat-tyrant 382
Chestnut-capped Piha *33*, 88
Chestnut-collared Swallow 685
Chestnut-crested Cotinga 75
Chestnut-crowned Becard *245*, 455
Chestnut-headed Finch-lark 573
Chestnut-headed Sparrow-lark 573
chii, Anthus 759
Chilean Elaenia 268
Chilean Martin 657
Chilean Plantcutter 74
Chilean Swallow 652
chilensis, Anthus correndera 760
chilensis, Elaenia albiceps 268
Chimney Swallow 665
chinchorrensis, Elaenia martinica 267
Chinchorro Elaenia 267
chinensis, Riparia paludicola 647
Chinese Pipit 754
chiribiquetensis, Hemitriccus margaritaceiventer 324
chiriquensis, Elaenia 272
Chiriqui Flycatcher 272
Chirocylla 89
Chiroxiphia 152
chlorion, Piprites chloris 167
chloris, Acanthisitta 465, *467*, *469*, 472
chloris, Hemimacronyx 771
chloris, Piprites 119, 167
chlorolepidota, Pipreola 68, 84
chloromeros, Pipra 145
chloronotus, Mionectes oleagineus 309
chloronotus, Tyrannus couchii 420
Chloropipo 160
chobiensis, Anthus vaalensis 753
Chocolate-vented Tyrant 391
chrysocephalum, Neopelma 121, 165
chrysocephalus, Myiodynastes 412
chrysocrotaphum, Todirostrum 187, 335
chrysogaster, Megarynchus pitangua 415
chrysolaema, Eremophila alpestris 589
chrysolophum, Neopelma 118, 166
chrysops, Zimmerius 297
chrysopterus, Masius 115, 155
chuana, Certhilauda 566
chyluensis, Anthus similis 749
cinchoneti, Conopias 412
cincta, Riparia 628, 649
cinctura, Ammomanes 511, 577
cineraceus, Contopus fumigatus 368
cinerascens, Camptostoma obsoletum 275
cinerascens, Myiarchus 214, *234*, 437
cinerascens, Myiodynastes chrysocephalus 413
cinerea, Calandrella 536, 583
cinerea, Motacilla 724, *732*, *733*, *737*, *740*, 785
cinerea, Myiopagis caniceps 265
cinerea, Serpophaga 194, 285
cinereicapilla, Zimmerius 296
cinereiceps, Phyllomyias 262
cinereiceps, Tolmomyias sulphurescens 338
cinereicollis, Myiornis auricularis 315
cinereifrons, Pseudelaenia leucospodia 294
cinereigulare, Oncostoma 316
cinereipectus, Poecilotriccus plumbeiceps 331
cinereiventris, Pachyramphus polychopterus 456
cinereocapilla, Motacilla flava 781
Cinereous Becard 455
Cinereous Ground-tyrant 400
Cinereous Mourner 446
Cinereous Tyrant 377
cinerescens, Elaenia martinica 267
cinereum, Todirostrum 221, 334
cinereus, Contopus 369
cinereus, Muscisaxicola 400
cinereus, Xolmis 203, 393
cineritius, Empidonax difficilis 364
cinnamomea, Neopipo 173, 352
cinnamomeipectus, Hemitriccus 327
cinnamomeiventris, Ochthoeca 382
cinnamomeus, Anthus 691, *696*, *730*, 746
cinnamomeus, Attila 444
cinnamomeus, Pachyramphus 455
cinnamomeus, Pyrrhomyias 353
cinnamomina, Galerida cristata 595
Cinnamon Attila 444
Cinnamon Becard 455
Cinnamon Bushlark 552
Cinnamon Flycatcher 353
Cinnamon Lark 543
Cinnamon Manakin 352
Cinnamon Neopipo 352
Cinnamon Tyrant *173*, 352
Cinnamon Tyrant-manakin 352
Cinnamon-bellied Ground-tyrant *206*, 402
Cinnamon-breasted Tody-tyrant 327
Cinnamon-crested Spadebill *178*, 340
Cinnamon-faced Tyrannulet 301
Cinnamon-throated Swallow 684

Cinnamon-vented Piha *70*, 90
circumdatus, Tyrannus savana 425
citata, Petrochelidon fulva 684
citreola, Motacilla 705, 782
citreopygus, Attila spadiceus 445
citrina, Acanthisitta chloris 472
Citrine Wagtail *705*, 782
citriniventris, Attila 444
Citron-bellied Attila 444
clamosus, Atrichornis 477, *479*, *480*, *481*, 482
clanceyi, Anthus vaalensis 753
clara, Hirundo lucida 666
clara, Lipaugus unirufus 89
clara, Motacilla 707, 786
clarus, Myiobius villosus 351
clarus, Tolmomyias assimilis 339
Cliff Flycatcher *226*, 353
Cliff Swallow *618*, *624*, *626*, 683
Clotbey Lark 578
clotbey, Ramphocoris 530, 578
Clotbey's Lark 578
Cloudforest Swallow 659
Club-winged Manakin *116*, 159
Cnemarchus 390
Cnemotriccus 356
Cnipodectes 345
Coast Swallow 666
Coastal Flycatcher 364
Coban Swallow 660
cocachacrae, Pyrocephalus rubinus 374
cockburniae, Anthus similis 749
Cock-of-the-rock
  Andean *35*, *47*, *58*, *59*, *60*, *67*, 107
  Guianan *42*, *65*, 107
  Orange 107
  Red 107
Cock-tailed Tyrant *255*, 388
Cocos Flycatcher 287
Cocos Island Flycatcher 287
codea, Calendulauda albescens 560
coelivox, Alauda gulgula 599
coeruleocapilla, Lepidothrix 147
Collared Bushlark 553
Collared Lark 544, 553
Collared Sand Martin *611*, *620*, *630*, *635*, 647
collaris, Mirafra 553
colletti, Macronyx capensis 772
collingwoodi, Tolmomyias flaviventris 340
Colonia 405
colonus, Colonia 200, 405
Colopteryx 318
coloreum, Todirostrum cinereum 334
Colorhamphus 384
columbiana, Tityra semifasciata 449
columbianus, Mionectes striaticollis 308
columbianus, Muscisaxicola alpinus 401
columbianus, Myiozetetes similis 407
comata, Dixiphia pipra 151
commandorensis, Anthus gustavi 765
Common Crested Lark 595
Common House Martin 674
Common Pipit 745
Common Sand Lark 585
Common Sand Martin 647
Common Short-toed Lark 585
Common Skylark 598
Common Swallow 665
Common Tody-flycatcher *221*, 334
Common Tufted Flycatcher 371
concolor, Hirundo 657
concolor, Ptyonoprogne 674
condita, Tijuca 90
confusa, Pipreola riefferii 80
confusus, Tolmomyias sulphurescens 338
congener, Lophotriccus vitiosus 318
congica, Riparia 647
Congo Martin 645, 647
Congo Sand Martin 647
Congo Saw-wing 643
conigravi, Petrochelidon ariel 682
Conioptilon 98
conirostris, Spizocorys 591
connectens, Myiarchus tuberculifer 432
connectens, Myiobius atricaudus 352
connivens, Myiozetetes similis 407
Conopias 411
Contopus 367
cooperi, Contopus 367
cooperi, Myiarchus tyrannulus 438
coracina, Dixiphia pipra 151
Corapipo 155
Cordilleran Flycatcher 364
cordofanica, Mirafra 546
coreensis, Galerida cristata 595
cornuta, Pipra 120, 145
coronata, Lepidothrix 113, *124*, 147
coronatus, Onychorynchus 179, 345
coronatus, Pachyramphus albogriseus 459
coronatus, Platyrinchus 341
coronatus, Xolmis 393
coronulatus, Masius chrysopterus 155
Correndera Pipit *696*, 760
correndera, Anthus 696, 760
Coryphotriccus 411
Corythopis 293
costaricensis, Pachyramphus versicolor 454
costaricensis, Tityra semifasciata 449
Cotinga 32, 73
  Antonia's 98
  Banded 94
  Bay-vented 75
  Black-and-gold *48*, *50*, 90
  Black-faced 98
  Black-necked Red *43*, 107
  Black-tipped 98
  Blue 93, 94
  Buff-throated 87
  Chestnut-bellied *34*, 75
  Chestnut-crested 75
  Dusky 87
  Grey-tailed 88
  Grey-winged 90
  Guianan Red 106
  Hopke's 98
  Kinglet 87
  Lovely 93
  Natterer's 93
  Olivaceous 88
  Orgaos 90
  Plum-throated *36*, 94
  Pompadour *36*, 97
  Purple-breasted 94
  Purple-throated 93
  Red 106, 107
  Red-crested *40*, 74
  Ridgway's 93
  Scimitar-winged 89
  Shrike 76
  Shrike-like 76
  Snow's 90
  Spangled *35*, 94
  Swallow-tailed *63*, *67*, 79
  Turquoise *69*, 93
  White 98
  White-browed 87
  White-cheeked 75
  White-tailed 97
  White-winged 97
  Yellow-billed 98
Cotinga 93
cotinga, Cotinga 94
COTINGIDAE 32, 73
cotta, Myiopagis 266
Couch's Kingbird 420
couchii, Tyrannus 420
Coues's Flycatcher 367
courtoti, Galerida cristata 595
coutellii, Anthus spinoletta 766
cowani, Riparia paludicola 647
coxi, Ammomanes deserti 578
cozumelae, Attila spadiceus 445
cozumelae, Myiarchus tyrannulus 438
Crag Martin 673
crassirostris, Tyrannus 421
crenatus, Anthus 756
Crested Becard 461
Crested Black-tyrant *238*, 379
Crested Doradito 289
Crested Lark *505*, 595
Crested Tyrannulet 261
Crested Wood Pewee 356
Crimson Fruitcrow *44*, 101
Crimson-hooded Manakin *136*, 143
crinitus, Myiarchus 207, *235*, *248*, 437
cristata, Calyptura 87
cristata, Elaenia 223, 271
cristata, Galerida 505, 595
cristatus, Oxyruncus 32, *53*, 73
cristatus, Phyllomyias griseiceps 261
croceus, Macronyx 703, *737*, *740*, 772
Crowned Chat-tyrant 381
Crowned Flycatcher 345
Crowned Slaty Flycatcher 416
crypta, Spizocorys conirostris 591
crypterythrus, Myiophobus fasciatus 348
cryptoleuca, Progne 655
cryptolophus, Snowornis 88
cryptoxanthus, Myiophobus 348
Cuban Crested Flycatcher 439
Cuban Martin 655
Cuban Pewee 370
cubensis, Tyrannus 256, 424
cucullata, Carpornis 41, 79
cucullata, Cecropis 612, 675
Culicivora 287
cumanensis, Zimmerius chrysops 297
curvirostris, Certhilauda 565
cuttingi, Delichon nipalense 675
cuzcoensis, Anairetes flavirostris 281
cyaneoviridis, Tachycineta 651
cyanirostris, Knipolegus 378
cyanodorsalis, Notiochelidon murina 659
cyanoleuca, Notiochelidon 659
cypriaca, Galerida cristata 595

D

D'Orbigny's Chat-tyrant 383
daaroodensis, Calandrella blanfordi 584
dabbenei, Anthus hellmayri 761
Damara Clapper Lark 553
damarensis, Certhilauda subcoronata 566
damarensis, Eremopterix verticalis 572
damarensis, Mirafra fasciolata 553
damarensis, Spizocorys conirostris 591
darica, Ammomanes deserti 578
Dark Pewee 367
Dark-faced Ground-tyrant 401
Dark-headed Wagtail 781
dasypus, Delichon 675
dathei, Melanocorypha calandra 579
daurica, Cecropis 604, *632*, 677
dauricus, Anthus richardi 745
davidwillardi, Elaenia pallatangae 274
daviesi, Anthus vaalensis 753
dayi, Elaenia 273
decaptus, Anthus similis 749
Deccan Lark 597
decolor, Stelgidopteryx ruficollis 662
decora, Pipreola aureopectus 83
decurvirostris, Dendroscansor 466
Degodi Lark *537*, 554
degodiensis, Mirafra 537, 554
deichleri, Galerida theklae 596
Delalande's Antpipit 293
delalandi, Corythopis 293
delamerei, Pseudalaemon fremantlii 593
Delichon 674
deliciosus, Machaeropterus 116, 159
deltae, Galerida cristata 595
Deltarhynchus 441
dementieva, Alauda arvensis 598
Dendronanthus 777
Dendroscansor 465
deprimozi, Galerida cristata 595
derbianus, Pitangus sulphuratus 409
Desert Finch-lark 577
Desert Lark *529*, 577
deserti, Ammomanes 529, 577
deserti, Mirafra fasciolata 553
deserticola, Megarynchus pitangua 415
desertorum, Alaemon alaudipes 567
deses, Tityra semifasciata 449
despotes, Tyrannus melancholicus 419
deva, Galerida 597
dewittei, Anthus similis 749
dharmakumarsinhjii, Alauda gulgula 599
diadema, Ochthoeca 381
diaphora, Eremophila alpestris 589
differens, Anthus trivialis 765
difficilis, Anthus 750
difficilis, Empidonax 364
difficilis, Myiodynastes maculatus 414
difficilis, Phylloscartes 251, 303
diluta, Riparia 648
dilutum, Ornithion brunneicapillus 274
dilutus, Platyrinchus cancrominus 340
dimidiata, Hirundo 629, 669
Dinelli's Doradito 289
dinelliana, Pseudocolopteryx 289
diops, Hemitriccus 321
discolor, Dixiphia pipra 151
disjuncta, Cecropis daurica 677
dissors, Ochthoeca leucophrys 383
dissors, Tolmomyias flaviventris 340
distinctus, Conopias albovittatus 411
Diucon
  Fire-eyed 393
diversa, Elaenia albiceps 268
diversum, Todirostrum maculatum 333
diversus, Leptopogon amaurocephalus 307
Dixiphia 151
dolgushini, Riparia riparia 647
Doliornis 75
dombrowskii, Motacilla flava 781
domestica, Progne chalybea 656
domicella, Cecropis daurica 677
domicola, Hirundo tahitica 667
dominicanus, Xolmis 254, 394
dominicensis, Myiarchus stolidus 440
dominicensis, Progne 656
dominicensis, Tyrannus 211, 423
Doradito
  Crested 289
  Dinelli's 289
  Subtropical 289
  Warbling *198*, *242*, 289
doriae, Alaemon alaudipes 567
dorsalis, Mionectes oleagineus 309
dorsalis, Pachyramphus polychopterus 456
Double-banded Pygmy-tyrant 318
Drab Water-tyrant 387
Drab-breasted Bamboo-tyrant 321
Drab-breasted Pygmy-tyrant 321
dubius, Pyrocephalus rubinus 374
ducis, Riparia paludicola 647
Duida Elaenia 273
duidae, Chloropipo uniformis 160
duidae, Cnemotriccus fuscatus 356
duidae, Contopus fumigatus 368
duidae, Hemitriccus margaritaceiventer 324
duidae, Platyrinchus mystaceus 341
duidae, Pogonotriccus chapmani 303
duidae, Schiffornis major 168
duidae, Tolmomyias sulphurescens 338
dukhunensis, Calandrella brachydactyla 583
dukhunensis, Motacilla alba 777
dulcivox, Alauda arvensis 598
Dull-capped Attila 445
dumicola, Schiffornis turdina 168
Dune Lark *512*, *525*, 560
Dunn's Lark *499*, 590
dunni, Eremalauda 499, 590
Dupont's Lark *520*, 568
duponti, Chersophilus 520, 568
Dusky Cliff Swallow 682
Dusky Cotinga 87
Dusky Crag Martin 674
Dusky Flycatcher 311, 363
Dusky Lark *501*, 563
Dusky Martin 674
Dusky Piha 88
Dusky Purpletuft 87
Dusky Swallow 682
Dusky-capped Flycatcher 432
Dusky-chested Flycatcher 408
Dusky-tailed Flatbill 443
Dwarf Tyrant-manakin *118*, 166
dyscolus, Mionectes oleagineus 309

E

Eared Pygmy-tyrant *187*, 315
Eastern Blue Swallow 670
Eastern Bushlark 543
Eastern Calandra Lark 579
Eastern Clapper Lark 553
Eastern Grey Short-toed Lark 585
Eastern House Swallow 666
Eastern Kingbird *212*, *241*, 422
Eastern Long-billed Lark 565
Eastern Phoebe 373
Eastern Red-rumped Swallow 678
Eastern Saw-wing 643
Eastern Scrub-bird 482
Eastern Short-toed Lark 585
Eastern Singing Bushlark 543
Eastern Sirystes 427
Eastern Skylark 599
Eastern Small Skylark 599
Eastern Striped Manakin 159
Eastern Swallow 666
Eastern Wood-pewee 369
Eastern Yellow-headed Wagtail 781
ecaudatus, Myiornis 246, 316
Ecuadorian Bristle-tyrant 300
Ecuadorian Swallow 685
Ecuadorian Tyrannulet 300
Ecuadorian Water-tyrant 388
editus, Anthus hoeschi 747
Edward Lyrebird 495
edwardi, Menura novaehollandiae 495
Egyptian Swallow 665
Egyptian Yellow Wagtail 781
eilata, Riparia riparia 647
Elaenia
  Antillean 273
  Brownish 271
  Caribbean 267
  Chilean 268
  Chinchorro 267
  Duida 273
  Foothill 265
  Forest 265
  Giant 271, 273
  Great 273
  Greater Antillean 273
  Greenish 266
  Grey 265
  Highland 273
  Jamaican 266
  Jamaican Yellow-crowned 266
  Large 268
  Lesser 272
  Mottle-backed 271
  Mountain 272
  Noronha *253*, 268
  Olivaceous 269

Pacific 266
Peruvian 268
Plain-crested *223*, 271
Roraiman 274
Rufous-crowned 272
Sierran 273
Slaty 271
Small-billed 269
White-crested 268
Yellow 266
Yellow-bellied *240*, 267
Yellow-crowned 266
Elaenia 267
Elainopsis 265
elatus, Tyrannulus 262
elegans, Eremophila bilopha 590
elegans, Laniisoma 34, 76
elegans, Progne 615, 657
Elegant Martin 657
Elegant Mourner *34*, 76
elfriedae, Calendulauda sabota 558
ellioti, Galerida theklae 596
eludens, Anthus brachyurus 768
elwesi, Eremophila alpestris 589
emini, Cecropis daurica 677
eminulus, Mitrephanes phaeocercus 371
Empidonax 359
Empidonomus 416
enertera, Eremophila alpestris 589
enigmaticus, Anthus pratensis 763
enthymia, Eremophila alpestris 589
Entotriccus 377
enunciator, Anthus leucophrys 753
Erard's Lark 554
Erator 449
Eremalauda 590
eremica, Calandrella blanfordi 584
eremodites, Eremalauda dunni 590
eremonoma, Phaeomyias murina 286
Eremophila 589
Eremopterix 571
Eribates 438
erikssoni, Chersomanes albofasciata 564
eritreae, Galerida cristata 595
Erlanger's Lark *508*, 584
Erlanger's Short-toed Lark 584
erlangeri, Calandrella 508, 584
erlangeri, Galerida theklae 596
erlangeri, Riparia cincta 649
erongo, Calendulauda sabota 558
erythrocephala, Mirafra 544
erythrocephala, Pipra 126, 144
erythrocercus, Myiarchus 438, 439
erythrochlamys, Calendulauda 512, *525*, 560
erythrochroa, Ammomanes deserti 578
erythrogaster, Hirundo rustica 665
erythrogenys, Tityra inquisitor 449
erythroptera, Mirafra 543
erythropterus, Myiozetetes cayanensis 406
erythropygia, Cecropis daurica 677
erythropygia, Pinarocorys 563
erythropygius, Cnemarchus 191, 390
erythrurus, Terenotriccus 352
esobe, Anthus pallidiventris 754
Ethiopian Long-clawed Lark 557
Ethiopian Longclaw 773
Ethiopian Saw-wing 643
Ethiopian Short-toed Lark 584
Ethiopian Swallow 668
eucephala, Lepidothrix iris 148
euchrysea, Tachycineta 650
Euler's Flycatcher 354
euleri, Lathrotriccus 354
eulophotes, Lophotriccus 317
Eumyiobius 378
Eurasian Crag Martin *608*, 673
Eurasian Skylark *519*, *522*, *532*, 598
Eurasian Swallow 665
Eurasian Tree Pipit 765
Eurochelidon 641
European Calandra Lark 579
European House Martin 674
European Rock Pipit 766
European Sand Martin 647
European Short-toed Lark 583
European Skylark 598
European Swallow 665
eurystomina, Pseudochelidon 609, 641
Euscarthmornis 322, 323, 324, 327, 328
Euscarthmus 293
examinatus, Tolmomyias assimilis 339
exasperatus, Anthus vaalensis 753
exiguus, Anthus novaeseelandiae 745
eximius, Anthus cinnamomeus 746
eximius, Pogonotriccus 304
exortivus, Tolmomyias sulphurescens 338
expectatus, Manacus manacus 157
exquisita, Lepidothrix coronata 147
Exquisite Manakin 147
exsul, Elaenia pallatangae 274
extimus, Empidonax traillii 360
Eye-ringed Flatbill 337
Eye-ringed Tody-tyrant *230*, 323

F

Fairy Martin 682
falcirostris, Certhilauda curvirostris 565
fallax, Elaenia 273
Fantee Roughwing 644
Fanti Roughwing 644
Fanti Saw-wing 644
fasciata, Atticora 609, 660
fasciaticollis, Mionectes olivaceus 309
fasciatus, Myiophobus 188, 348
fasciatus, Phyllomyias 176, 259
fasciicauda, Pipra 143
fasciolata, Mirafra 553
fastuosa, Chiroxiphia linearis 152
faustus, Leptopogon amaurocephalus 307
Fawn Bushlark 558
Fawn Lark 558
Fawn-coloured Lark 558
federalis, Hemitriccus granadensis 327
feldegg, Motacilla flava 781
fenestrarum, Delichon urbicum 674
fernandezianus, Anairetes 250, 282
ferocior, Myiarchus swainsoni 432
ferox, Myiarchus 434
ferrieri, Atrichornis rufescens 482
ferruginea, Alauda 559
ferruginea, Hirundinea 226, 353
ferruginea, Ochthoeca fumicolor 383
Ferruginous Lark 559
festae, Galerida cristata 595
festiva, Pipreola aureopectus 83
fiedleri, Myiozetetes similis 407
Field-tyrant
Short-tailed 405
Fierce Flycatcher 433
Fiery-capped Manakin 159
Fiery-throated Fruiteater *68*, 84
filicauda, Pipra 127, 143
filifera, Hirundo smithii 668
Finch-lark
Ashy-crowned 574
Black-bellied 574
Black-crowned 572
Black-eared 571
Black-tailed 577
Ceylon 574
Chestnut-backed 571
Chestnut-headed 573
Desert 577
Fischer's 573
Grey-backed 572
Rufous-tailed 577
White-cheeked 571
White-crested 572
White-fronted 572
finitimum, Todirostrum cinereum 334
Fiordland Rock Wren 473
Fire-eyed Diucon 393
Fischer's Finch-lark 573
Fischer's Sparrow-lark 573
fischeri, Mirafra rufocinnamomea 552
Flame-crested Manakin 161
Flame-crowned Manakin 161
flammeus, Pyrocephalus rubinus 374
flammiceps, Myiophobus fasciatus 348
flammiceps, Pipra erythrocephala 144
Flammulated Bamboo-tyrant 322
Flammulated Flycatcher 441
Flammulated Pygmy-tyrant 322
flammulatus, Attila spadiceus 445
flammulatus, Deltarhynchus 441
flammulatus, Hemitriccus 322
Flappet Lark 552
Flatbill
Bamboo 443
Dusky-tailed 443
Eye-ringed 337
Fulvous-breasted 338
Grey-crowned 339
Large-headed *188*, 443
Olivaceous 337
Pacific 337
Rufous-tailed 443
Yellow-breasted 340
Yellow-margined 339
Yellow-olive 338
Zimmer's 339
flava, Eremophila alpestris 589
flava, Motacilla 689, *711*, *712*, *725*, *726*, 781
flaveola, Capsiempis 238, 287
flaveolus, Manacus manacus 157
flavescens, Empidonax 242, 365
flavescens, Lullula arborea 600
flavescens, Melanocorypha maxima 580
flavescens, Tyrannus caudifasciatus 424
Flavescent Flycatcher 346
flavicans, Myiophobus 346
flavicapilla, Chloropipo 139, 161
flavicollis, Macronyx 742, 773
flavicollis, Pipra aureola 143
flavidifrons, Zimmerius chrysops 297
flavidior, Myiarchus nuttingi 437
flavigularis, Machetornis rixosa 405
flavigularis, Platyrinchus 342
flavimentum, Phyllomyias nigrocapillus 261
flavinucha, Muscisaxicola 206, 400
flavipes, Notiochelidon 659
flavirostris, Anairetes 281
flavirostris, Lathrotriccus euleri 354
flavirostris, Phibalura 63, *67*, 79
flavissima, Motacilla flava 781
flaviventre, Camptostoma obsoletum 275
flaviventris, Empidonax 359
flaviventris, Lathrotriccus euleri 354
flaviventris, Motacilla 704, 785
flaviventris, Phylloscartes 301
flaviventris, Pseudocolopteryx 198, *242*, 289
flaviventris, Tolmomyias 340
flavivertex, Heterocercus 161
flavivertex, Myiopagis 266
flaviviridis, Hemitriccus zosterops 322
flavocinerea, Stigmatura budytoides 295
flavogaster, Elaenia 240, 267
flavoolivaceus, Tolmomyias sulphurescens 338
flavotectus, Tolmomyias assimilis 339
flavovirens, Phylloscartes 300
flavus, Rhynchocyclus olivaceus 337
fluviatilis, Muscisaxicola 399
Fluvicola 387
fluvicola, Petrochelidon 624, 682
Flycatcher
Acadian *180*, 359
Alder 360
Amazonian Royal 345
Apical 434
Ash-throated *214*, *234*, 437
Atlantic Royal 345
Bahama 439
Baird's 413
Bearded 351
Beardless 275
Belted 356
Bent-billed 316
Black-billed 355
Black-capped 365
Black-tailed 352
Boat-billed *247*, 415
Bran-coloured *188*, 348
Brown-crested 438
Brownish 345
Buff-breasted 365
Campo Suiriri 276
Chaco Suiriri 276
Chapada *217*, 276
Chiriqui 272
Cinnamon 353
Cliff *226*, 353
Coastal 364
Cocos 287
Cocos Island 287
Common Tufted 371
Cordilleran 364
Coues's 367
Crowned 345
Crowned Slaty 416
Cuban Crested 439
Dusky 311, 363
Dusky-capped 432
Dusky-chested 408
Euler's 354
Fierce 433
Flammulated 441
Flavescent 346
Fork-tailed *215*, *239*, 424, 425
Fuscous 356
Galapagos 438
Golden-bellied 412
Golden-crowned 412
Great Crested *207*, *235*, *248*, 437
Grenada 439
Grey Flycatcher 362
Grey-breasted 355
Grey-capped *220*, 407
Grey-crowned 339
Grey-hooded *232*, 310
Guadeloupe 440
Hammond's 362
Handsome 347
Inca 308
Interior 365
Jamaican 431
Kiskadee 409
La Sagra's *184*, 439
Large-billed 438
Least 361
Lemon-browed 412
Lesser Antillean 440
Lima 348
McConnell's 309
Northern Royal 345
Northern Suiriri 276
Nutting's 437
Ochraceous-breasted 347
Ochre-bellied 309
Ochre-lored 340
Oleaginous 309
Olivaceous 432
Olive 371
Olive Tufted 371
Olive-chested 348
Olive-faced 340
Olive-sided 367
Olive-striped 308
Orange-banded 347
Orange-crested 346
Orange-eyed 339
Orange-vented 408
Ornate *177*, 315
Pacific Royal 345
Pacific-slope 364
Pale-edged 435
Pale-throated 437
Panama 433
Pelzeln's 432
Pileated 356
Pine 363
Piratic 406
Ponderosa 365
Puerto Rican 440
Redwoods 364
Roraiman 347
Royal *179*, 345
Ruddy-tailed 352
Rufescent 348
Rufous 431
Rufous-breasted 307
Rufous-tailed 439
Rusty-margined *200*, 406
Rusty-tailed 438
Sad 431
Scissor-tailed *184*, 424
Seaboard 431
Sepia-capped *231*, 307
Short-crested 434
Slaty-capped 307
Social *212*, *216*, 407
Sooty-crowned 435
Southern Suiriri 276
Stolid 440
Streak-necked 308
Streaked *244*, 414
Suiriri 276
Sulphur-bellied 413
Sulphur-rumped 351
Sulphury *189*, 415
Swainson's 432
Swallow 353
Tawny-breasted 351
Tawny-chested 355
Three-striped 411
Traill's 360
Tufted 371
Unadorned 346
Variegated 416
Venezuelan 433
Vermilion *181*, 374
Vermilion-crowned 407
Western 364
Whiskered *233*, 351
White-bearded 408
White-ringed 411
White-throated 361
Whiteley's 432
Wied's 438
Wied's Crested 438
Willow 360
Wright's 362
Yellow-bellied 359
Yellow-breasted 340
Yellow-crowned 411
Yellow-margined 339
Yellow-olive *229*, 338
Yellow-rumped 351
Yellow-throated 411
Yellowish *242*, 365
Yucatan 431
foetidus, Gymnoderus 45, 99
fohkienensis, Riparia diluta 648
Foothill Elaenia 265
forbeswatsoni, Eremopterix nigriceps 572
Forest Cliff Swallow 682
Forest Elaenia 265
Forest Swallow 682
Forest Wagtail *693*, *734*, 777

forficatus, Tyrannus 184, 424
Fork-tailed Flycatcher *215*, *239*, 424, 425
Fork-tailed Pygmy-tyrant *256*, 328
Fork-tailed Saw-wing 643
Fork-tailed Tody-tyrant 328
formosa, Pipreola 46, 84
forresti, Mirafra javanica 543
fortis, Agriornis lividus 395
fortis, Tityra semifasciata 449
fortis, Xolmis pyrope 393
forwoodi, Motacilla alba 777
Foxy Lark 559
franciscanus, Knipolegus aterrimus 379
frantzii, Elaenia 272
fraserii, Tityra inquisitor 449
frater, Oxyruncus cristatus 73
fraterculа, Ammomanes deserti 577
fraterculus, Onychorynchus coronatus 345
frederici, Rhytipterna simplex 426
fremantlii, Pseudalaemon 511, 593
Friedmann's Bushlark 547
Friedmann's Lark 547
fringillaris, Spizocorys 540, 592
frondicolus, Anthus nyassae 748
frontalis, Hirundo tahitica 667
frontalis, Muscisaxicola 402
frontalis, Ochthoeca 381
frontalis, Pipreola 83
frontata, Motacilla alba 777
Fruitcrow
  Bare-necked *45*, 99
  Crimson *44*, 101
  Purple-throated *52*, 101
  Red-breasted 101
  Red-ruffed *45*, 101
  Scutated 101
Fruiteater
  Band-tailed 80
  Barred 80
  Black-chested 83
  Black-headed 80
  Bluish-crowned 83
  Bluish-fronted 83
  Chapman's 83
  Fiery-throated *68*, 84
  Golden-breasted 83
  Green-and-black *37*, 80
  Handsome *46*, 84
  Huanuco 80
  Masked 83
  Orange-breasted 83
  Red-banded 84
  Scaled *44*, 84
  Scarlet-breasted 83
  Tallmans' 80
fucata, Alopochelidon 662
fuellebornii, Macronyx 773
fuliginosa, Petrochelidon 682
fuliginosa, Psalidoprocne 643
fuligula, Ptyonoprogne 673
Fülleborn's Longclaw 773
fulva, Petrochelidon 684
fulviceps, Euscarthmus meloryphus 293
fulvida, Calandrella cinerea 584
fulvidior, Pachyramphus cinnamomeus 455
fulvifrons, Empidonax 365
fulvigularis, Terenotriccus erythrurus 352
fulvipectus, Hirundo aethiopica 668
fulvipectus, Rhynchocyclus 338
fulvipennis, Stelgidopteryx serripennis 661
Fulvous-breasted Flatbill 338
fumicolor, Ochthoeca 383
fumifrons, Poecilotriccus 331
fumigatus, Contopus 368
fumigatus, Myiotheretes 390
fumosus, Cnemotriccus fuscatus 356
furcatus, Anthus 759
furcatus, Hemitriccus 256, 328
furensis, Mirafra rufocinnamomea 552
furfurosus, Myiophobus fasciatus 348
furva, Mirafra erythroptera 543
fusca, Iodopleura 87
fusca, Progne tapera 657
fuscatior, Cnemotriccus fuscatus 356
fuscatus, Cnemotriccus 356
fuscicapillus, Colonia colonus 405
fuscicauda, Ramphotrigon 443
fusciceps, Empidonax fulvifrons 365
fusciventris, Ptyonoprogne fuligula 673
fuscocinereus, Lipaugus 88
fuscorufus, Myiotheretes 390
Fuscous Flycatcher 356
fuscus, Casiornis 428

G

gabbii, Tyrannus caudifasciatus 424
gafsae, Galerida cristata 595
gaimardii, Myiopagis 265
Galapagos Flycatcher 438
Galapagos Martin 657
galbinus, Mionectes olivaceus 309
galeata, Antilophia 113, *137*, 151
galeatus, Lophotriccus 318
Galerida 595
gallarum, Mirafra hypermetra 548
Gambian Barn Swallow 666
Gambian Swallow 666
ganieri, Petrochelidon pyrrhonota 683
garrula, Chersomanes albofasciata 564
gaumeri, Attila spadiceus 445
gavrilovi, Riparia diluta 648
gaza, Melanocorypha calandra 579
geophilus, Anthus rubescens 767
gephyra, Cecropis daurica 677
gertrudis, Pseudhirundo griseopyga 644
geyri, Ammomanes deserti 577
ghansiensis, Mirafra africana 551
Giant Elaenia 271, 273
Giant Kingbird *256*, 424
giffardi, Galerida modesta 597
gigas, Elaenia 271
Gillett's Lark 553
gilletti, Mirafra 553
gilli, Certhilauda subcoronata 566
gilviventris, Xenicus 466, *471*, 473
gilvus, Zimmerius gracilipes 297
giraudi, Eremophila alpestris 589
glaber, Sublegatus arenarum 310
glabricollis, Cephalopterus 57, *62*, 102
Glossy-backed Becard 460
gobabisensis, Calendulauda africanoides 558
Godlewski's Pipit 750
godlewskii, Anthus 750
Golden Lark 546
Golden Pipit *694*, 771
Golden Swallow 650
Golden-bellied Flycatcher 412
Golden-breasted Fruiteater 83
Golden-browed Chat-tyrant 381
Golden-collared Manakin *130*, *131*, 156
Golden-crested Manakin 161, 162
Golden-crowned Flycatcher 412
Golden-crowned Manakin *140*, 148
Golden-crowned Spadebill 341
Golden-faced Tyrannulet 297
Golden-headed Manakin *126*, 144
Golden-rumped Swallow 677
Golden-scaled Pygmy-tyrant 318
Golden-winged Manakin *115*, 155
Golden-winged Tody-flycatcher 333
gomesi, Mirafra africana 551
goodsoni, Anthus vaalensis 753
gordoni, Cecropis semirufa 676
Gorgeted Sand Martin 647
gouldii, Anthus leucophrys 753
gracilipes, Zimmerius 297
gracilis, Lepidothrix nattereri 147
gracilis, Stigmatura budytoides 295
granadensis, Hemitriccus 327
granadensis, Myiozetetes 220, 407
granadensis, Pyroderus scutatus 101
grandis, Motacilla 704, 778
grandis, Myiozetetes similis 407
granti, Acanthisitta chloris 472
Grass-tyrant
  Sharp-tailed 287
Grassland Pipit 746
Grassveld Pipit *691*, *696*, *730*, 746
gratiosa, Ochthoeca diadema 382
gravis, Pachyramphus aglaiae 460
Gray's Lark *498*, 563
Gray's Sand Lark 563
grayi, Ammomanopsis 498, 563
grayi, Anthus correndera 760
Great Crested Flycatcher *207*, *235*, *248*, 437
Great Elaenia 273
Great Kiskadee *199*, *213*, *248*, 408
Great Shrike-tyrant 395
Greater Antillean Elaenia 273
Greater Antillean Pewee 370
Greater Hoopoe-lark *502*, *512*, 567
Greater Kiskadee 409
Greater Manakin 168
Greater Pewee 367
Greater Schiffornis 168
Greater Short-toed Lark *503*, *504*, *523*, 583
Greater Striated Swallow 678
Greater Striped Swallow *612*, 675
Greater Wagtail-tyrant 295
Green Manakin *122*, 160
Green Wren 473
Green-and-black Fruiteater *37*, 80
Green-backed Becard *186*, 453
Green-crowned Wagtail 781
Green-crowned Yellow Wagtail 781
Green-headed Wagtail 781
Green-headed Yellow Wagtail 781
Greenheart Bird 89
Greenish Elaenia 266
Greenish Manakin 168
Greenish Mourner *119*, 168
Greenish Schiffornis 168
Greenish Tyrannulet 259
Greenish-bellied Manakin 156
gregaria, Spizocorys starki 591
Grenada Flycatcher 439
Grey Elaenia 265
Grey Flycatcher 362
Grey Kingbird *211*, 423
Grey Monjita *203*, 393
Grey Wagtail *724*, *732*, *733*, *737*, *740*, 785
Grey-and-white Tyrannulet 294
Grey-backed Finch-lark 572
Grey-backed Sparrow-lark 571, 572
Grey-backed Tachuri 288
Grey-backed Wagtail 786
Grey-bellied Shrike-tyrant 396
Grey-breasted Flycatcher 355
Grey-breasted Martin *603*, 656
Grey-breasted Sand Martin 647
Grey-capped Flycatcher *220*, 407
Grey-capped Tyrannulet 260
Grey-collared Becard 459
Grey-crowned Flatbill 339
Grey-crowned Flycatcher 339
Grey-crowned Tyrannulet 286
Grey-faced Tody-Tyrant 321
Grey-headed Attila 444
Grey-headed Manakin 166
Grey-headed Piprites 166
Grey-headed Tody-flycatcher 333
Grey-headed Wagtail 781
Grey-hooded Attila *185*, 445
Grey-hooded Flycatcher *232*, 310
Grey-hooded Manakin 166
Grey-rumped Swallow *623*, 644
Grey-tailed Cotinga 88
Grey-tailed Piha 88
Grey-throated Attila 445
Grey-throated Bentbill 316
Grey-winged Cotinga 90
Greyish Mourner *173*, 426
Grimwood's Longclaw 774
grimwoodi, Macronyx 774
grisea, Serpophaga cinerea 285
griseiceps, Atalotriccus pilaris 318
griseiceps, Hemitriccus striaticollis 323
griseiceps, Phyllomyias 261
griseiceps, Piprites 166
griseiceps, Serpophaga 286
griseiceps, Tityra semifasciata 449
griseigula, Laniocera rufescens 446
griseigularis, Elaenia albiceps 268
griseigularis, Pachyramphus viridis 453
griseipectus, Hemitriccus 323
griseipectus, Lathrotriccus 355
griseiventris, Neochelidon tibialis 661
griseocapilla, Phyllomyias 260
griseocapillus, Phylloscartes superciliaris 301
griseolus, Poecilotriccus sylvia 332
griseopyga, Pseudhirundo 623, 644
Griseotyrannus 416
griseovinacea, Spizocorys conirostris 591
grisescens, Mirafra africana 551
grisescens, Piprites chloris 167
grisescens, Tolmomyias sulphurescens 338
griseum, Camptostoma obsoletum 275
griseus, Anthus campestris 750
griseus, Eremopterix 520, 574
griseus, Muscisaxicola 399
grotei, Anthus cinnamomeus 746
Ground-tyrant
  Black-billed 395
  Black-fronted 402
  Cinereous 400
  Cinnamon-bellied *206*, 402
  Dark-faced 401
  Little 399
  Ochre-naped *206*, 400
  Paramo 401
  Plain-capped 401
  Puna 399
  Red-rumped 390
  Rufous-naped 400
  Rufous-webbed 391
  Spot-billed 399
  Taczanowski's 399
  White-browed 401
  White-fronted *193*, 400
Guadeloupe Flycatcher 440
gualaquizae, Phylloscartes 300
guatimalensis, Pitangus sulphuratus 409
guayaquilensis, Pachyramphus albogriseus 459
Gubernetes 402
Guianan Cock-of-the-rock *42*, *65*, 107
Guianan Red Cotinga 106
guianensis, Lophotriccus vitiosus 318
guianensis, Myiopagis gaimardii 265
guianensis, Rhynchocyclus olivaceus 337
guillelmi, Alauda arvensis 598
gularis, Mecocerculus leucophrys 279
gulgula, Alauda 506, 599
gumia, Platyrinchus coronatus 341
gustavi, Anthus 738, 765
guttata, Calendulauda albescens 560
guttatum, Todirostrum chrysocrotaphum 335
gutturalis, Anthus 697, 758
gutturalis, Corapipo 155
gutturalis, Hirundo rustica 665
gutturosus, Manacus manacus 157
Gymnoderus 99

H

Habrura 288
Haematoderus 101
haemsi, Anthus rubescens 767
halfae, Galerida cristata 595
hallae, Anthus similis 749
halli, Mirafra javanica 543
hamertoni, Alaemon 567
Hammond's Flycatcher 362
hammondii, Empidonax 362
Handsome Flycatcher 347
Handsome Fruiteater *46*, 84
Hangnest Tody-tyrant 324
hannumi, Tityra semifasciata 449
Haplochelidon 660
hararensis, Anthus similis 749
harei, Calendulauda africanoides 558
harei, Calendulauda burra 559
harei, Galerida magnirostris 598
haringtoni, Anthus trivialis 765
harrarensis, Galerida theklae 596
harrisoni, Eremopterix signatus 573
harterti, Alauda arvensis 598
harterti, Mirafra africana 551
harterti, Myiozetetes cayanensis 406
harti, Eremopterix verticalis 572
harti, Spizocorys conirostris 591
hauxwelli, Mionectes oleagineus 309
Hazel-fronted Pygmy-tyrant 290
hebraica, Melanocorypha calandra 579
hederaceus, Mionectes olivaceus 309
Heine's Kingbird 419
heinei, Calandrella rufescens 586
helenae, Galerida cristata 595
helenae, Neopipo cinnamomea 352
Hellmayr's Pipit *700*, *708*, 761
hellmayri, Anthus 700, *708*, 761
hellmayri, Attila rufus 445
hellmayri, Empidonax occidentalis 364
hellmayri, Leptopogon superciliaris 307
hellmayri, Mecocerculus 279
hellmayri, Myiozetetes cayanensis 406
hellmayri, Rhynchocyclus brevirostris 337
hellmayri, Terenotriccus erythrurus 352
Helmeted Manakin *113*, *137*, 151
Helmeted Pygmy-tyrant 318
Hemicecrops 669
hemichrysus, Myiodynastes 412
Hemimacronyx 771
Hemitriccus 321
henrici, Mirafra africana 551
heraelaciniae, Galerida cristata 595
herberti, Alauda gulgula 599
herero, Calendulauda sabota 558
hermonensis, Calandrella brachydactyla 583
hesperia, Progne subis 655
hesperianus, Anthus petrosus 766
hespericola, Tyrannus tyrannus 423
hesperis, Myiozetetes similis 407
heterocerca, Pipra 143
Heterocercus 161
heterogyna, Knipolegus aterrimus 379
heteroleuca, Corapipo leucorrhoa 155
Heteromirafra 557
Heteroxolmis 394
hewitti, Mirafra fasciolata 553
Highland Elaenia 273
hijazensis, Ammomanes deserti 577
Hill Swallow 666
Hirundinea 353
HIRUNDINIDAE 602, 641
Hirundo 665
Hispaniolan Pewee 370
hispaniolensis, Contopus 370
Hodgson's Pipit 764
Hodgson's Tree Pipit 764
Hodgson's Wagtail 777
hodgsoni, Anthus 701, 764
hoeschi, Ammomanopsis grayi 563
hoeschi, Anthus 747
hoeschi, Calendulauda sabota 558
hoeschi, Eremopterix leucotis 571
hoflingi, Knipolegus nigerrimus 379
holdereri, Melanocorypha maxima 580

holerythra, Rhytipterna 427
holochlora, Chloropipo 122, 160
holomelas, Psalidoprocne pristoptera 644
homochrous, Pachyramphus 461
Hooded Berryeater *41*, 79
Hoopoe Lark 567
Hoopoe-lark
Greater *502*, *512*, 567
Lesser 567
Hopke's Cotinga 98
hopkei, Carpodectes 98
Horned Lark *513*, *516*, 589
Horsfield's Bushlark 543
horsfieldii, Mirafra javanica 543
House Martin 674
House Swallow 665, 666
Hova Lark 545
hova, Mirafra 545
hoyti, Eremophila alpestris 589
huancabambae, Anairetes flavirostris 281
Huanuco Fruiteater 80
Hudson's Black-tyrant 377
hudsoni, Knipolegus 377
huei, Galerida theklae 596
Hume's Lark 585
Hume's Short-toed Lark 585
hungarica, Calandrella brachydactyla 583
huriensis, Galerida theklae 596
hygricus, Macronyx croceus 772
Hylonax 439
Hymenops 375
hypermetra, Mirafra 509, 548
hyperythra, Cecropis daurica 677
hypochlorus, Lophotriccus pileatus 317
hypoglaucus, Oxyruncus cristatus 73
hypoleuca, Serpophaga 285
hypophaeus, Pachyramphus aglaiae 460
hypopolia, Petrochelidon pyrrhonota 683
hypopyrra, Laniocera 446

I

iberiae, Motacilla flava 781
Iberian Wagtail 781
Iberian Yellow Wagtail 781
icterica, Motacilla flaviventris 785
icterophrys, Conopias cinchoneti 412
icterophrys, Satrapa 387
Idioptilon 321, 322, 323, 324, 327, 328
idius, Leptopogon amaurocephalus 307
ignifera, Pipra mentalis 144
ignobilis, Phaeomyias murina 286
Ihering's Tyrannulet 303
ijimae, Riparia riparia 647
Ilicura 153
illigeri, Todirostrum chrysocrotaphum 335
imani, Galerida cristata 595
imatacae, Platyrinchus mystaceus 341
imberbe, Camptostoma 275
immaculatus, Anthus bogotensis 761
immunda, Rhytipterna 427
imperturbatus, Empidonax flavescens 365
impiger, Hemitriccus margaritaceiventer 324
implacens, Myiopagis viridicata 266
improbus, Zimmerius 295
improvisus, Mionectes olivaceus 308
Inca Flycatcher 308
Inca Leptopogon 308
incomta, Phaeomyias murina 286
inconspicua, Alauda gulgula 599
Indian Bushlark 543
Indian Cliff Martin 682
Indian Cliff Swallow 682
Indian Lark 543
Indian Long-billed Pipit 749
Indian Pipit 746, 754
Indian Red-winged Bushlark 543
Indian Red-winged Lark 543
Indian Rock Pipit 749
Indian Sand Lark 586
Indian Sand Martin 647
Indian Short-toed Lark 586
Indian Skylark 599
Indian Small Skylark 599
Indian Swallow 682
Indian Tree Pipit 764
Indian White Wagtail 777
indica, Riparia diluta 648
indicus, Dendronanthus 693, *734*, 777
Indochinese Bushlark 544
inerme, Ornithion 274
inexpectatus, Empidonax fulvifrons 365
Inezia 311
inflava, Phaeomyias murina 286
innominata, Riparia riparia 647
inopinata, Alauda gulgula 599
inopinatus, Anthus hodgsoni 764
inornata, Inezia 311
inornata, Neopelma 165
inornata, Phelpsia 408
inornatus, Hemitriccus 324
inornatus, Myiophobus 346
inornatus, Tolmomyias sulphurescens 338
inquietus, Myiarchus nuttingi 437
inquisitor, Tityra 220, 449
insignis, Myiobius barbatus 351
insignis, Tolmomyias sulphurescens 338
insolens, Agriornis montanus 395
insolens, Myiodynastes maculatus 414
insularis, Ammomanes deserti 578
insularis, Eremophila alpestris 589
insularis, Hirundo rustica 665
insularis, Pachyramphus aglaiae 460
insularis, Platyrinchus mystaceus 341
insularum, Myiarchus tyrannulus 438
insulicola, Empidonax difficilis 364
insulicola, Myiarchus venezuelensis 433
intensa, Elaenia pallatangae 274
intensa, Spizocorys personata 592
intensus, Hemitriccus granadensis 327
intensus, Mionectes oleagineus 309
intercedens, Calendulauda alopex 559
Interior Flycatcher 365
interior, Manacus manacus 157
interior, Myiarchus phaeocephalus 435
interior, Ochthoeca leucophrys 383
intermedia, Alauda arvensis 598
intermedia, Ammomanes deserti 577
intermedia, Inezia caudata 312
intermedia, Pipreola 80
intermedia, Schiffornis turdina 168
intermedius, Agriornis montanus 395
intermedius, Pachyramphus castaneus 455
inzonata, Stigmatura budytoides 295
Iodopleura 87
iohannis, Hemitriccus 323
ioniae, Galerida cristata 595
iranica, Ammomanes deserti 578
Iridoprocne 649, 651, 652
iris, Lepidothrix 148
irupero, Xolmis 183, 394
irwini, Mirafra africana 551
isabellae, Iodopleura 87
isabellina, Ammomanes deserti 578
isabellina, Galerida cristata 595
isidorei, Lepidothrix 147
islerorum, Suiriri 217, 276
isolata, Mirafra africana 551
itombwensis, Anthus cinnamomeus 746
itzensis, Pachyramphus major 460
iwanowi, Galerida cristata 595

J

Jackson's Pipit 747
jacksoni, Atrichornis rufescens 482
jagmi, Pachyplichas 466
jaliscensis, Myiopagis viridicata 266
Jamaican Becard 461
Jamaican Elaenia 266
Jamaican Flycatcher 431
Jamaican Pewee 370
Jamaican Yellow-crowned Elaenia 266
jamaicensis, Tyrannus caudifasciatus 424
janeti, Ammomanes deserti 577
Japanese Pied Wagtail 777, 778
Japanese Skylark 598
Japanese Wagtail *704*, 778
japonica, Alauda arvensis 598
japonica, Cecropis daurica 677
japonicus, Anthus rubescens 767
jappi, Mirafra fasciolata 553
Javan Lark 543
javanica, Hirundo tahitica 667
javanica, Mirafra 543
jebelmarrae, Anthus similis 749
jelambianus, Rhynchocyclus olivaceus 337
Jelski's Bush-tyrant 377
Jelski's Chat-tyrant *174*, 382
jelskii, Ochthoeca 174, 382
Jerdon's Bushlark 543
jerdoni, Anthus similis 749
jesupi, Ochthoeca diadema 382
Jet Manakin 160
Johannes's Pygmy-tyrant 323
Johannes's Tody-tyrant 323
Johnson's Tody-tyrant *172*, 329
johnstonei, Empidonax euleri 354
jordansi, Galerida cristata 595
josensis, Anthus similis 749
josephinae, Hemitriccus 322
Josephine's Tody-tyrant 322
Juan Fernandez Tit-tyrant *250*, 282
jucunda, Pipreola 83
juninensis, Muscisaxicola 399
juruanus, Pachyramphus rufus 455

K

kabalii, Mirafra africana 551
Kaempfer's Tody-tyrant *257*, 328
kaempferi, Hemitriccus 257, 328
Kaffa Saw-wing 643
kalahariae, Chersomanes albofasciata 564
kalaharica, Mirafra fasciolata 553
Kalochelidon 650
Kamchatka Pied Wagtail 777
kangrae, Motacilla maderaspatensis 778
kaokoensis, Certhilauda benguelensis 566
Karoo Lark 560
Karoo Long-billed Lark 566
karruensis, Calendulauda albescens 560
Kashmir House Martin 675
kashmirica, Melanocorypha maxima 580
kastschenkoi, Anthus campestris 750
katangae, Anthus cinnamomeus 746
kathangorensis, Mirafra hypermetra 548
katharinae, Ammomanes deserti 577
kathleenae, Pipreola whitelyi 84
kawirondensis, Mirafra rufocinnamomea 552
keasti, Mirafra javanica 543
Kenya Swallow 644
Kerala Rock Pipit 749
khama, Eremopterix verticalis 572
khamensis, Eremophila alpestris 589
kiborti, Alauda arvensis 598
kidepoensis, Mirafra hypermetra 548
Kimberley Pipit 749
Kingbird
Arkansas 422
Cassin's 421
Couch's 420
Eastern *212*, *241*, 422
Giant *256*, 424
Grey *211*, 423
Heine's 419
Loggerhead 424
Snowy-throated 419
Thick-billed 421
Tropical *199*, 419
Western *186*, 422
White-throated 419
Kinglet Calyptura 87
Kinglet Cotinga 87
Kiskadee
Great *199*, *213*, *248*, 408
Greater 409
Lesser *197*, *222*, 409
Kiskadee Flycatcher 409
klagesi, Taeniotriccus andrei 329
klagesi, Tolmomyias poliocephalus 339
kleinschmidti, Anthus petrosus 766
kleinschmidti, Galerida cristata 595
Knipolegus 377
kollmanspergeri, Ammomanes deserti 578
kolymensis, Riparia riparia 647
Kordofan Bushlark 546
Kordofan Lark 546
kosteri, Psalidoprocne pristoptera 643
krishnakumarsinhji, Calandrella raytal 586
kronei, Phylloscartes 299
kukunoorensis, Calandrella rufescens 586
kumboensis, Cecropis daurica 677
kumerloevei, Eremophila alpestris 589
Kuril Wagtail 781
Kuril Yellow Wagtail 781
kurrae, Mirafra africana 551

L

La Sagra's Flycatcher *184*, 439
lactea, Eremophila alpestris 589
lacuum, Anthus cinnamomeus 746
lagopodum, Delichon urbicum 674
lamellipennis, Xipholena 97
Lamprochelidon 650
lamprochroma, Eremophila alpestris 589
lanceolata, Chiroxiphia 152
Lance-tailed Manakin 152
Laniisoma 76
Laniisoma
Andean 76
Laniocera 446
lanioides, Lipaugus 70, 90
lanyoni, Myiarchus yucatanensis 431
lanyoni, Pogonotriccus 305
lanzaroteae, Anthus berthelotii 755
Large Desert Lark 567
Large Elaenia 268
Large Pied Wagtail 778
Large Striped Pipit 755
Large Yellow-tufted Pipit 756
Large-billed Flycatcher 438
Large-billed Lark *507*, 558, 598
Large-headed Flatbill *188*, 443
Larger Striated Swallow 678
Larger Stripe-breasted Swallow 675
Lark 496, 543
Abyssinian 559
African Short-toed 583
Agulhas Clapper 552
Agulhas Long-billed 565
Angola 551
Archer's 557
Archer's Long-clawed 557
Aristida 560
Ash's 547
Asian Grey Short-toed 585
Asian Short-toed 585, 586
Asiatic Calandra 580
Asiatic 580
Athi 585
Athi Short-toed 585
Australasian 543
Bar-tailed *511*, 552, 577
Bar-tailed Desert 577
Bar-tailed Sand 577
Barlow's *497*, 560
Beesley's 564
Benguela Long-billed *496*, 566
Bifasciated 567
Bimaculated *517*, 579
Black *502*, 581
Black-tailed 577
Black-tailed Desert 577
Blanford's 584
Blanford's Short-toed 584
Botha's *540*, 592
Bradfield's 558
Buckley's 552
Bush 544
Calandra *526*, *535*, 579
Cape Clapper 552
Cape Long-billed 565
Cape Verde 600
Cinnamon 543
Clotbey 578
Clotbey's 578
Collared 544, 553
Common Crested 595
Common Sand 585
Common Short-toed 585
Crested *505*, 595
Damara Clapper 553
Deccan 597
Degodi *537*, 554
Desert *529*, 577
Dune *512*, *525*, 560
Dunn's *499*, 590
Dupont's *520*, 568
Dusky *501*, 563
Eastern Calandra 579
Eastern Clapper 553
Eastern Grey Short-toed 585
Eastern Long-billed 565
Eastern Short-toed 585
Erard's 554
Erlanger's *508*, 584
Erlanger's Short-toed 584
Ethiopian Long-clawed 557
Ethiopian Short-toed 584
European Calandra 579
European Short-toed 583
Fawn 558
Fawn-coloured 558
Ferruginous 559
Flappet 552
Foxy 559
Friedmann's 547
Gillett's 553
Golden 546
Gray's *498*, 563
Gray's Sand 563
Greater Short-toed *503*, *504*, *523*, 583
Hoopoe 567
Horned *513*, *516*, 589
Hova 545
Hume's 585
Hume's Short-toed 585
Indian 543
Indian Red-winged 543
Indian Sand 586
Indian Short-toed 586
Javan 543
Karoo 560
Karoo Long-billed 566
Kordofan 546
Large Desert 567
Large-billed *507*, 558, 598
Latakoo 547
Lesser Sand 585
Lesser Short-toed 585
Long-billed 565, 580
Long-billed Calandra 580
Long-clawed 557
Madagascar 545

Malabar Lark 597
Malabar Crested 597
Marsabit 546
Masked 592
Melodious 547
Mongolian *502*, 580
Mongolian Grey Short-toed 585
Mongolian Sand 580
Mongolian Short-toed 585
Monotonous 546
Namaqua Clapper 553
Northern White-tailed 545
Nyiro 547
Obbia 592
Pink-billed 591
Pink-breasted *514*, 558
Przewalski's 589
Pygmy Spike-heeled 564
Raso *541*, 600
Raso Short-toed 600
Raytal 586
Raza 600
Red *528*, *539*, 559
Red Somali 548, 551
Red-backed 560
Red-capped *536*, 583
Red-tailed 563
Red-winged *509*, 543, 548
Rudd's *541*, 557
Rudd's Long-clawed 557
Rufous 547
Rufous Short-toed 583, 585
Rufous-naped *521*, *523*, *526*, 551
Rufous-rumped 563
Rufous-tailed *499*, 577
Rufous-tailed Desert 577
Rufous-winged 544
Rusty 546
Rusty-winged 543
Sabota *524*, 558
Sagon 547
Sand 559, 577, 586
Sclater's 592
Sclater's Short-toed 592
Shore 589
Short-clawed 566
Short-crested 597
Short-tailed *511*, 593
Short-toed 583
Sidamo *538*, 557
Sidamo Long-clawed 557
Singing 545
Slender-billed 585
Somali 548, 551, 557
Somali Long-billed 548
Somali Long-clawed 557
Somali Short-toed 585
South African Long-clawed 557
Southern 547
Southern Singing 547
Southern Thick-billed 598
Spike-heeled *518*, 564
Stark's *527*, 591
Stark's Short-toed 591
Sun 597
Sykes's 597
Sykes's Crested 597
Tawny 597
Temminck's *500*, 590
Temminck's Horned 590
Thekla *510*, *531*, *533*, 596
Thick-billed *530*, 578, 598
Tibetan *507*, 580
White-tailed 545, 546
White-winged 580
Williams's 546
Witherby's 567
Latakoo Lark 547
Lathria 88
Lathrotriccus 354
latimerae, Chersomanes albofasciata 564
latimerae, Macronyx capensis 772
latirostris, Contopus 181, 370
latirostris, Pachyramphus aglaiae 460
latirostris, Poecilotriccus 331
latirostris, Sayornis nigricans 373
latistriatus, Anthus 747
Lawrence's Bent-billed Tyrant 317
lawrencei, Lathrotriccus euleri 354
lawrenceii, Myiarchus tuberculifer 432
Least Flycatcher 361
Least Shrike-tyrant 396
leautungensis, Galerida cristata 595
Legatus 406
leggei, Anthus brachyurus 768
lehmani, Hemitriccus granadensis 327
Lemon-browed Flycatcher 412
lepida, Tachycineta thalassina 650
Lepidothrix 147
Leptopogon 307
Leptopogon
Inca 308
Rufous-breasted 307
Sepia-capped 307
Slaty-capped 307
White-bellied 307
Leptotriccus 302
Lesser Antillean Flycatcher 440
Lesser Antillean Pewee *181*, 370
Lesser Elaenia 272
Lesser Hoopoe-lark 567
Lesser Kiskadee *197*, *222*, 409
Lesser Sand Lark 585
Lesser Short-toed Lark 585
Lesser Shrike-tyrant 396
Lesser Skylark 599
Lesser Striated Swallow 677
Lesser Striped Swallow *603*, 676
Lesser Tody-Tyrant 321
Lesser Wagtail-tyrant 294
Lessonia 375
leucansiptila, Eremophila alpestris 589
leucocephala, Arundinicola 195, *227*, 388
leucocephala, Motacilla flava 781
leucochlamys, Manacus manacus 157
leucocraspedon, Anthus similis 749
leucogonys, Phyllomyias burmeisteri 259
leucolaema, Eremophila alpestris 589
leucometopa, Ochthoeca leucophrys 383
leuconota, Colonia colonus 405
leucopareia, Eremopterix 573
leucophaea, Calandrella rufescens 586
leucophaius, Legatus 406
leucophrys, Anthus 753
leucophrys, Capsiempis flaveola 287
leucophrys, Mecocerculus 279
leucophrys, Ochthoeca 383
leucopsis, Motacilla alba 777
leucoptera, Melanocorypha 580
leucopyga, Hirundo 652
leucopygia, Iodopleura pipra 87
leucopygia, Lepidothrix isidorei 147
leucorrhoa, Corapipo 115, 155
leucorrhoa, Tachycineta 652
leucoryphus, Platyrinchus 342
leucosoma, Hirundo 669
leucospodia, Pseudelaenia 294
leucosterna, Cheramoeca 645
leucotis, Eremopterix 571
leucura, Tityra 449
leucurus, Agriornis montanus 395
lhamarum, Alauda gulgula 599
liberiae, Pseudhirundo griseopyga 644
libertatis, Tachuris rubrigastra 315
Lichenops 375
lichenya, Anthus cinnamomeus 746
lictor, Philohydor 197, *222*, 409
Lima Flycatcher 348
linearis, Chiroxiphia 132, *133*, 152
lineiventris, Anthus 716, 755
linteatus, Heterocercus 161
lintoni, Myiophobus 347
Lipaugus 88
Lita Manakin 160
litae, Chloropipo holochlora 160
litae, Myiophobus phoenicomitra 346
Little Blue Swallow 669
Little Ground-tyrant 399
Little Skylark 599
Little Tawny Pipit 768
littoralis, Anthus petrosus 766
littoralis, Myiarchus tuberculifer 432
littoralis, Ochthornis 387
lividus, Agriornis 395
loaensis, Tachuris rubrigastra 315
Loggerhead Kingbird 424
Loja Tyrannulet 297
Long-billed Calandra Lark 580
Long-billed Lark 565, 580
Long-billed Pipit *736*, 749
Long-billed Wren 466
Long-clawed Lark 557
Long-crested Pygmy-tyrant 317
Long-legged Pipit 754
Long-tailed Manakin *132*, *133*, 152
Long-tailed Pipit *686*, 753
Long-tailed Tyrannulet 301
Long-tailed Tyrant *200*, 405
Long-tailed Wagtail 786
Long-wattled Umbrellabird *40*, 102
Longclaw
Abyssinian *742*, 773
Cape *692*, *721*, 772
Ethiopian 773
Fülleborn's 773
Grimwood's 774
Orange-throated 772
Pangani 773
Pink-throated 774
Rosy-breasted *702*, *715*, 774
Rosy-throated 774
Sharpe's *743*, 771
Yellow-breasted 771
Yellow-throated *703*, *737*, *740*, 772
longibarbatus, Manacus manacus 157
longicauda, Motacilla 786
longicaudatus, Anthus 686, 753
longipennis, Calandrella brachydactyla 583
longipes, Xenicus 473
longirostris, Eremophila alpestris 589
longispina, Chersomanes albofasciata 564
longonotensis, Calendulauda alopex 559
lonnbergi, Alauda arvensis 598
lophotes, Knipolegus 238, 379
Lophotriccus 317
Lovely Cotinga 93
Lowland Swallow 677
lubomirskii, Pipreola 83
lucaysiensis, Myiarchus sagrae 439
lucida, Hirundo 666
lugens, Motacilla alba 777
lugubris, Anthus rufulus 746
lugubris, Contopus 367
lugubris, Myiotheretes fumigatus 390
Lullula 600
Lulu von Hagen's Tody-tyrant 329
Lulu's Tody-tyrant 329
luluae, Poecilotriccus 172, 329
lutea, Motacilla flava 781
luteiventris, Lophotriccus pileatus 317
luteiventris, Myiodynastes 413
luteiventris, Myiozetetes 408
luteocephala, Muscicapa 166
luteocephalus, Heterocercus 161, 162
lutescens, Anthus 759
lutescens, Mionectes oleagineus 309
lwenarum, Anthus hoeschi 747
lwenarum, Mirafra rufocinnamomea 552
lyalli, Traversia 465
lynesi, Anthus cinnamomeus 746
lynesi, Galerida cristata 595
lynesi, Hirundo atrocaerulea 670
lynesi, Mirafra rufa 546
Lyrebird 484, 494
Albert's *489*, *493*, 494
Edward 495
Northern 494
Prince Albert 494
Prince Albert's 494
Prince Edward 495
Queen Victoria 495
Superb *485*, *486*, *487*, *490*, *491*, 495
Victoria 495

M

mababiensis, Mirafra rufocinnamomea 552
macconnelli, Mionectes 309
macdonaldi, Calendulauda alopex 559
macdonaldi, Chersomanes albofasciata 564
Machaeropterus 159
Machetornis 405
macilvainii, Myiopagis gaimardii 265
maclovianus, Muscisaxicola 401
Macronyx 772
macronyx, Motacilla flava 781
macrorhamphus, Progne chalybea 656
macrorhyncha, Galerida cristata 595
maculata, Cotinga 94
maculata, Galerida cristata 595
maculatum, Todirostrum 333
maculatus, Myiodynastes 244, 414
maculirostris, Muscisaxicola 399
Madagascar Bushlark 545
Madagascar Lark 545
Madagascar Martin 645
Madagascar Wagtail *704*, 785
madagascariensis, Phedina borbonica 645
madaraszi, Eremopterix leucotis 571
madaraszi, Galerida cristata 595
madeirensis, Anthus berthelotii 755
maderaspatensis, Motacilla 709, 778
magdae, Galerida cristata 595
magdalenae, Pachyramphus cinnamomeus 455
magister, Myiarchus tyrannulus 438
magna, Galerida cristata 595
magnirostris, Capsiempis flaveola 287
magnirostris, Galerida 507, 598
magnirostris, Myiarchus 438
major, Pachyramphus 459
major, Pyrocephalus rubinus 374
major, Schiffornis 120, 168
majus, Camptostoma obsoletum 275
makarikari, Calendulauda africanoides 558
makawai, Spizocorys conirostris 591
Malabar Crested Lark 597
Malabar Lark 597
malabarica, Galerida 597
malayensis, Anthus rufulus 746
malbranti, Mirafra africana 551
Malindi Pipit 755
mallablensis, Anthus melindae 755
mallablensis, Galerida theklae 596
mallopega, Hirundo tahitica 667
Manacus 156
manacus, Manacus 128, 157
Manakin 110, 143
Almirante 156
Anomalous 143, 161
Araripe *141*, 151
Band-tailed 143
Bearded 157
Black *117*, 160
Black-capped 167
Blue *114*, 153
Blue-backed *138*, 152
Blue-crowned *113*, *124*, 147
Blue-rumped 147
Broad-billed 167
Brown 168
Cerulean-capped 147
Cinnamon 352
Club-winged *116*, 159
Crimson-hooded *136*, 143
Eastern Striped 159
Exquisite 147
Fiery-capped 159
Flame-crested 161
Flame-crowned 161
Golden-collared *130*, *131*, 156
Golden-crested 161, 162
Golden-crowned *140*, 148
Golden-headed *126*, 144
Golden-winged *115*, 155
Greater 168
Green *122*, 160
Greenish 168
Greenish-bellied 156
Grey-headed 166
Grey-hooded 166
Helmeted *113*, *137*, 151
Jet 160
Lance-tailed 152
Lita 160
Long-tailed *132*, *133*, 152
Olive 160
Opal-crowned 148
Orange-bellied *111*, 148
Orange-collared *116*, 156
Orange-crested *117*, 162
Orange-crowned 162
Pale-bellied 165
Pearl-headed 148
Pin-tailed *114*, 153
Red-capped *125*, *129*, 144
Red-headed *126*, 144
Round-tailed 145
Saffron-crested 165
Scarlet-horned *120*, 145
Sclater's 151
Sick's 148
Snow-capped 147
Striped 159
Sulphur-bellied 165
Swallow-tailed 153
Tepui 148
Thrush-like 168
Tobago 152
Velvet 151
Velvety 147
Western Striped *112*, 159
White-bearded *128*, 157
White-bibbed 155
White-collared *134*, *135*, 156
White-crowned *123*, 151
White-fronted *136*, 148
White-ruffed *115*, 155
White-throated 155
Wied's 165
Wing-barred 167
Wire-tailed *127*, 143
Yellow-crested 161
Yellow-crowned 161
Yellow-headed *139*, 161
Yellow-thighed 144
Yungas *121*, 153
Zeledon's 151
mandschurica, Hirundo rustica 665
manens, Myiarchus tuberculifer 432
mangbettorum, Psalidoprocne pristoptera 644
Mangbettu Saw-wing 643
Mangrove Swallow 651
Many-coloured Rush-tyrant *196*, *225*, 315
Many-coloured Tyrant 315
Maracaibo Tody-flycatcher 334
Maranon Tit-tyrant 280
maranonica, Phaeomyias murina 286
maranonicum, Camptostoma obsoletum 275
Marble-faced Bristle-tyrant *174*, 304

margaritaceiventer, Hemitriccus 204, 324
margaritae, Chersophilus duponti 568
marginata, Mirafra cantillans 545
marginatus, Pachyramphus 459
marionae, Mirafra 544
maritimus, Agriornis montanus 395
marjoriae, Mirafra apiata 552
marjorinus, Contopus cooperi 367
marngli, Cheramoeca leucosterna 645
Maroon-belted Chat-tyrant 382
Marsabit Lark 546
Marsh-tyrant
White-headed *195*, *227*, 388
Martin 602, 641
African River *609*, 641
African Rock 673
African Sand 647
Asian 675
Asian House 675
Australian Tree 683
Banded *628*, 649
Banded Sand 649
Brazza's 645
Brown-chested *612*, 657
Brown-throated Sand 647
Caribbean 656
Chilean 657
Collared Sand *611*, *620*, *630*, *635*, 647
Common House 674
Common Sand 647
Congo 645, 647
Congo Sand 647
Crag 673
Cuban 655
Dusky 674
Dusky Crag 674
Elegant 657
Eurasian Crag *608*, 673
European House 674
European Sand 647
Fairy 682
Galapagos 657
Gorgeted Sand 647
Grey-breasted *603*, 656
Grey-breasted Sand 647
House 674
Indian Cliff 682
Indian Sand 647
Kashmir House 675
Madagascar 645
Mascarene 645
Mountain Crag 673
Nepal 675
Nepal House 675
Northern Crag 673
Northern House *619*, *627*, 674
Pale 648
Pale Crag 673
Pale Sand 648
Peruvian 657
Plain 647
Plain Sand 647
Purple *638*, 655
Red-throated Rock 673
Rock 673
Sinaloa 656
Snowy-bellied 656
Southern *615*, 657
Tree 683
Western House 674
White-bellied 656
White-eyed River 641
martinica, Elaenia 267
marungensis, Anthus vaalensis 753
marungensis, Mirafra angolensis 551
marwitzi, Hirundo dimidiata 670
Masatierra Tit-tyrant 282
Mascarene Martin 645
Masius 155
Masked Fruiteater 83
Masked Lark 592
Masked Tityra *172*, *236*, 449
Masked Wagtail 777
Masked Water-tyrant 388
masoni, Pyroderus scutatus 101
massaica, Calendulauda poecilosterna 558
massaica, Psalidoprocne pristoptera 644
mastacalis, Myiobius barbatus 351
matudai, Pachyramphus major 460
mauritanica, Riparia paludicola 647
maxima, Cecropis abyssinica 676
maxima, Melanocorypha 507, 580
maximiliani, Pitangus sulphuratus 409
maximiliani, Riparia riparia 647
maximus, Manacus manacus 157
maynana, Cotinga 36, 94
maynanus, Mionectes oleagineus 309
mayri, Cecropis striolata 678
mcchesneyi, Spizocorys personata 592
McConnell's Flycatcher 309
mcilhennyi, Conioptilon 98
Meadow Pipit *695*, 763
Mecocerculus 279
medius, Anthus rufulus 746
megacephalum, Ramphotrigon 188, 443
megaensis, Calandrella somalica 585
megaensis, Hirundo 669
megaensis, Pseudalaemon fremantlii 593
Megarynchus 415
meinertzhageni, Anthus petrosus 766
meinertzhageni, Chersomanes albofasciata 564
Mekong Wagtail *687*, 779
melanauchen, Eremopterix nigriceps 572
melancholicus, Tyrannus 199, 419
melanocephala, Carpornis 70, 79
melanocephalus, Eremopterix leucotis 571
Melanocorypha 579
melanocrissus, Cecropis daurica 677
melanogaster, Petrochelidon pyrrhonota 683
melanogrisea, Motacilla flava 781
melanolaema, Pipreola riefferii 80
melanoleuca, Atticora 660
melanomystax, Poecilotriccus ruficeps 329
melanope, Motacilla cinerea 785
melbina, Pseudhirundo griseopyga 644
melindae, Anthus 755
Melodious Lark 547
meloryphus, Euscarthmus 293
melvillensis, Mirafra javanica 543
mentalis, Muscisaxicola maclovianus 401
mentalis, Pipra 125, *129*, 144
Menura 494
MENURIDAE 484, 494
Menzbier's Pipit 765
menzbieri, Anthus gustavi 765
mercedesfosterae, Mionectes macconnelli 310
meridae, Anthus bogotensis 761
meridae, Mionectes olivaceus 308
meridana, Ochthoeca diadema 382
meridensis, Notiochelidon murina 659
meridionale, Delichon urbicum 674
meridionalis, Galerida cristata 595
meridionalis, Pachyramphus versicolor 454
merrilli, Eremophila alpestris 589
mesoleuca, Elaenia 269
Mexican Becard 459
Mexican Spadebill 340
mexicanus, Megarynchus pitangua 415
mexicanus, Onychorynchus coronatus 345
mexicanus, Pyrocephalus rubinus 374
mexicanus, Xenotriccus 356
meyeni, Tachycineta 652
Microcochlearius 322
microlopha, Dixiphia pipra 151
microptera, Mirafra 544
micropterus, Agriornis 396
Microtriccus 274
militaris, Haematoderus 44, 101
militaris, Ilicura 114, 153
millardi, Calandrella cinerea 584
milleri, Manacus vitellinus 156
Milvulus 424, 425
Minas Gerais Tyrannulet *257*, 302
mindanensis, Mirafra javanica 543
mindoensis, Snowornis cryptolophus 88
minima, Dixiphia pipra 151
minima, Myiopagis viridicata 266
minima, Neochelidon tibialis 661
minima, Petrochelidon pyrrhonota 683
minimus, Empidonax 361
minimus, Hemitriccus 324
minimus, Zimmerius chrysops 297
minor, Calandrella rufescens 586
minor, Cnipodectes subbrunneus 345
minor, Contopus pertinax 367
minor, Hemitriccus 321
minor, Mecocerculus 280
minor, Myiodynastes chrysocephalus 413
minor, Pachyramphus 461
minor, Pipra mentalis 144
minor, Riparia paludicola 647
minor, Xenopsaris albinucha 453
minuscula, Lepidothrix coronata 147
minyanyae, Mirafra angolensis 551
Mionectes 308
Mirafra 543
mirandae, Hemitriccus 327
mirei, Ammomanes deserti 577
mirus, Rhynchocyclus olivaceus 337
miserabilis, Myiornis ecaudatus 316
Mishana Tyrannulet *170*, 296
Mishima Tyrannulet 296
Mistletoe Tyrannulet 295
Mitrephanes 371
mituense, Poecilotriccus latirostris 331
mixtus, Poecilotriccus latirostris 331
mixtus, Tolmomyias sulphurescens 338
Moco Pipit 749
moco, Anthus similis 749
modesta, Elaenia albiceps 268
modesta, Galerida 597
modesta, Progne 657
modestus, Myiobius atricaudus 352
modestus, Sublegatus 311
moeritica, Galerida cristata 595
molestus, Zimmerius chrysops 297
moltschanowi, Galerida cristata 595
monachus, Tyrannus savana 425
Mongolian Grey Short-toed Lark 585
Mongolian Lark *502*, 580
Mongolian Sand Lark 580
Mongolian Short-toed Lark 585
Mongolian Skylark 580
mongolica, Melanocorypha 502, 580
Monjita
Black-and-white *254*, 394
Black-crowned 393
Grey *203*, 393
Rusty-backed 394
Salinas *252*, 394
White *183*, 394
White-rumped *237*, 393
monodi, Ammomanes deserti 577
Monotonous Bushlark 546
Monotonous Lark 546
Montane Blue Swallow *639*, 670
montanus, Agriornis 192, 395
monteiri, Cecropis senegalensis 677
montensis, Mecocerculus leucophrys 279
montivaga, Galerida magnirostris 598
morenoi, Contopus caribaeus 370
Moroccan Wagtail 777
Mosque Swallow *608*, *625*, 677, 678
Motacilla 777
MOTACILLIDAE 686, 745
Mottle-backed Elaenia 271
Mottle-cheeked Tyrannulet 299
Mountain Crag Martin 673
Mountain Elaenia 272
Mountain Pipit 747, 758, 766
Mountain Roughwing 643
Mountain Roughwing Swallow 643
Mountain Saw-wing 643
Mountain Wagtail *707*, 786
Mourner
Brown 168
Buckley's 76
Cinereous 446
Elegant *34*, 76
Greenish *119*, 168
Greyish *173*, 426
Pale-bellied 427
Rufous 427
Speckled 446
Thrush-like *110*, 168
Varzea *120*, 168
Mouse-brown Shrike-tyrant 396
Mouse-coloured Tyrannulet 286
muehlii, Galerida cristata 595
muhingae, Anthus vaalensis 753
munda, Serpophaga 286
murina, Notiochelidon 659
murina, Phaeomyias 286
murinus, Agriornis 396
murphyi, Progne 657
Muscicapa 166
Muscigralla 405
Muscipipra 402
Muscisaxicola 399
mya, Ammomanes deserti 577
Myiarchus 431
Myiobius 351
Myiochanes 367
Myiodynastes 412
Myiopagis 265
Myiophobus 346
Myiornis 315
Myiotheretes 389
Myiotriccus 315
Myiozetetes 406
mystaceus, Platyrinchus 224, 341
mzimbaensis, Anthus caffer 768

N

naevia, Calendulauda sabota 558
Namaqua Clapper Lark 553
namibicus, Anthus vaalensis 753
namiyei, Hirundo tahitica 667
nanus, Pachyramphus marginatus 459
nanus, Pyrocephalus rubinus 374
napaeum, Camptostoma obsoletum 275
napensis, Chiroxiphia pareola 152
napensis, Stigmatura 294
nata, Mirafra fasciolata 553
Natalornis 670
Natterer's Cotinga 93
nattereri, Anthus 742, 761
nattereri, Attila bolivianus 445
nattereri, Lepidothrix 147
nattereri, Platyrinchus platyrhynchos 342
nattererii, Cotinga 93
naumburgae, Hemitriccus obsoletus 321
naumburgae, Hemitriccus zosterops 322
navai, Myiarchus yucatanensis 431
neglecta, Petrochelidon nigricans 683
neglectum, Todirostrum chrysocrotaphum 335
neglectus, Platyrinchus mystaceus 341
neglectus, Tolmomyias assimilis 339
Negrito
Andean 375
Andean Rufous-backed 375
Austral *201*, 375
Patagonian 375
Rufous-backed 375
Salvin's 375
Southern Rufous-backed 375
White-winged 375
nengeta, Fluvicola 388
Neochelidon 661
Neopelma 165
Neophedina 649
Neopipo 352
Neopipo
Cinnamon 352
neoxena, Hirundo 606, 667
Neoxolmis 391, 394
Nepal House Martin 675
Nepal Martin 675
nerlyi, Contopus caribaeus 370
Nesotriccus 287
neumanni, Anthus vaalensis 753
neumanni, Cecropis semirufa 676
neumanni, Galerida cristata 595
neumannianus, Anthus similis 749
New Guinea Pipit *697*, 758
New South Wales Bird-of-paradise 495
New Zealand Pipit 745
New Zealand Wren 464, 472
newtoni, Riparia paludicola 647
nicaraguae, Mitrephanes phaeocercus 371
niceforoi, Muscisaxicola maculirostris 399
nicholsoni, Anthus similis 749
nicolli, Calandrella rufescens 586
nidipendulus, Hemitriccus 324
niethammeri, Calandrella rufescens 586
niethammeri, Mirafra angolensis 551
niger, Pachyramphus 461
nigerrimus, Knipolegus 182, 379
nigrescens, Alauda arvensis 598
nigrescens, Contopus 371
nigrescens, Mirafra africana 551
nigricans, Galerida cristata 595
nigricans, Petrochelidon 683
nigricans, Pinarocorys 501, 563
nigricans, Sayornis 373
nigricans, Serpophaga 285
nigricapillus, Myiarchus tuberculifer 432
nigriceps, Eremopterix 500, *524*, 572
nigriceps, Mecocerculus leucophrys 280
nigriceps, Myiarchus tuberculifer 432
nigriceps, Tityra semifasciata 449
nigriceps, Todirostrum 335
nigricollis, Phoenicircus 43, 107
nigrifrons, Eremophila alpestris 589
nigrifrons, Phylloscartes 300
nigrimentale, Delichon dasypus 675
nigrita, Galerida modesta 597
nigrita, Hirundo 669
nigrita, Ochthoeca cinnamomeiventris 382
nigriticola, Mirafra rufa 546
nigriventris, Pachyramphus polychopterus 456
nigrocapillus, Phyllomyias 261
nigrocristatus, Anairetes 280
nigrorufa, Hirundo 670
Nile Swallow 665
nilghiriensis, Anthus 741, 754
Nilgiri House Swallow 666
Nilgiri Pipit *741*, 754
nipalense, Delichon 675
nipalensis, Cecropis daurica 677
nitens, Psalidoprocne 643
nitidus, Carpodectes 64, 97
niveiceps, Colonia colonus 405
niveigularis, Platyrinchus mystaceus 341
niveigularis, Tyrannus 419
niveni, Calandrella cinerea 584
nivescens, Anthus similis 749
niveus, Xolmis irupero 394
nobilis, Myiodynastes maculatus 414
Noisy Scrub-bird *477*, *479*, *480*, *481*, 482
normantoni, Mirafra javanica 543
Noronha Elaenia *253*, 268
North American Cliff Swallow 683
North Island Bush Wren 473
North Island Rifleman 472
North Island Stout-legged Wren 466
Northern Beardless Tyrannulet 275
Northern Bentbill 316

Northern Crag Martin 673
Northern House Martin *619*, *627*, 674
Northern Lyrebird 494
Northern Rough-winged Swallow *611*, *622*, 661
Northern Royal Flycatcher 345
Northern Scrub-flycatcher 310
Northern Skylark 598
Northern Suiriri Flycatcher 276
Northern White-tailed Bushlark 545
Northern White-tailed Lark 545
notatus, Mecocerculus leucophrys 280
Notiochelidon 659
novaehollandiae, Menura 485, *486*, *487*, *490*, *491*, 495
novaeseelandiae, Anthus 690, *719*, 745
nubica, Galerida cristata 595
nudicollis, Procnias 50, *51*, *53*, 105
nugator, Myiarchus 439
Nuttallornis 367
Nutting's Flycatcher 437
nuttingi, Myiarchus 437
nyassae, Anthus 731, 748
nyikae, Mirafra africana 551
Nyiro Bushlark 547
Nyiro Lark 547

O

oaxacae, Eremophila alpestris 589
Obbia Lark 592
obbiensis, Spizocorys 592
oberholseri, Empidonax 363
oberholseri, Progne subis 655
oberi, Contopus latirostris 370
oberi, Myiarchus 440
obfuscata, Ochthoeca rufipectoralis 382
oblitus, Myiophobus pulcher 347
obscura, Calandrella rufescens 585
obscura, Elaenia 273
obscura, Inezia subflava 312
obscura, Lepidothrix 148
obscura, Psalidoprocne 644
obscurata, Chersomanes albofasciata 564
obscuriceps, Hemitriccus striaticollis 323
obscuriceps, Tolmomyias assimilis 339
obscurior, Myiozetetes granadensis 407
obscurior, Sublegatus 311
obscuritergum, Leptopogon amaurocephalus 307
obscurodorsalis, Machetornis rixosa 405
obscurostriatus, Machaeropterus striolatus 159
obscurum, Poecilotriccus plumbeiceps 331
obscurus, Mionectes oleagineus 309
obscurus, Pyrocephalus rubinus 374
obsoleta, Ptyonoprogne fuligula 673
obsoletum, Camptostoma 202, 275
obsoletus, Hemitriccus 321
occidentalis, Empidonax 364
occidentalis, Eremophila alpestris 589
occidentalis, Mirafra africana 551
occidentalis, Myiozetetes granadensis 407
occidentalis, Onychorynchus coronatus 345
occidentalis, Pipreola riefferii 80
occidentalis, Pyroderus scutatus 101
occidentis, Pinarocorys nigricans 563
occipitalis, Muscisaxicola rufivertex 400
occulta, Dixiphia pipra 151
ochraceiventris, Myiophobus 347
Ochraceous Attila 444
Ochraceous Pewee 368
Ochraceous-breasted Flycatcher 347
ochraceus, Contopus 368
Ochre-bellied Flycatcher 309
Ochre-breasted Pipit *742*, 761
Ochre-faced Tody-flycatcher *230*, 331
Ochre-lored Flycatcher 340
Ochre-naped Ground-tyrant *206*, 400
ochropterus, Poecilotriccus latirostris 331
Ochthodiaeta 377, 389, 390
Ochthoeca 381
Ochthornis 387
ocularis, Motacilla alba 777
oenanthoides, Ochthoeca 383
olallai, Myiopagis 265
oleaginea, Psalidoprocne pristoptera 644
oleagineus, Mionectes 309
Oleaginous Flycatcher 309
Oleaginous Pipromorpha 309
olivacea, Schiffornis turdina 168
Olivaceous Cotinga 88
Olivaceous Elaenia 269
Olivaceous Flatbill 337
Olivaceous Flycatcher 432
Olivaceous Piha 88
Olivaceous Tody-tyrant 323
olivaceum, Camptostoma obsoletum 275
olivaceum, Oncostoma 317
olivaceus, Mionectes 308
olivaceus, Mitrephanes 371
olivaceus, Myiotheretes fumigatus 390
olivaceus, Rhynchocyclus 337
olivascens, Hemitriccus flammulatus 322
olivascens, Myiarchus tuberculifer 432
Olive Flycatcher 371
Olive Manakin 160
Olive Tree Pipit 764
Olive Tufted Flycatcher 371
Olive-backed Pipit *701*, 764
Olive-chested Flycatcher 348
Olive-faced Flycatcher 340
Olive-green Tyrannulet 300
Olive-sided Flycatcher 367
Olive-striped Flycatcher 308
olivina, Elaenia pallatangae 274
omaruru, Calendulauda africanoides 558
omoensis, Anthus leucophrys 753
omoensis, Mirafra rufocinnamomea 552
Oncostoma 316
One-coloured Becard 461
ongumaensis, Calandrella cinerea 583
Onychorynchus 345
Opal-crowned Manakin 148
ophthalmicus, Pogonotriccus 174, 304
Orange Cock-of-the-rock 107
Orange-banded Flycatcher 347
Orange-bellied Manakin *111*, 148
Orange-breasted Fruiteater 83
Orange-collared Manakin *116*, 156
Orange-crested Flycatcher 346
Orange-crested Manakin *117*, 162
Orange-crowned Manakin 162
Orange-eyed Flycatcher 339
Orange-throated Longclaw 772
Orange-vented Flycatcher 408
orbitalis, Pogonotriccus 304
orbitatus, Hemitriccus 230, 323
oreas, Lessonia 375
oreinus, Anthus sylvanus 754
orenocensis, Knipolegus 378
orenocensis, Pyroderus scutatus 101
Oreotriccus 261
Orgaos Cotinga 90
Oriental Mosque Swallow 678
Oriental Pipit 746, 754
Oriental Skylark *506*, 599
Oriental Tree Pipit 764
orientalis, Ammomanes deserti 578
orientalis, Calandrella brachydactyla 583
orientalis, Ochthoeca frontalis 381
orientalis, Psalidoprocne pristoptera 644
orinocensis, Leptopogon amaurocephalus 307
orinocensis, Sublegatus arenarum 310
orinomus, Cnemarchus erythropygius 390
Ornate Flycatcher *177*, 315
Ornate Umbrellabird 102
ornatus, Cephalopterus 102
ornatus, Myiotriccus 177, 315
ornatus, Pachyramphus albogriseus 459
Ornithion 274
Orochelidon 659
oroyae, Haplochelidon andecola 660
orphnum, Camptostoma obsoletum 275
Otto's Bristle-tyrant 304
ottonis, Pogonotriccus ophthalmicus 304
Oustalet's Tyrannulet 303
oustaleti, Phylloscartes 303
Oxyruncus 73

P

Pachyplichas 465
Pachyramphus 453
Pacific Elaenia 266
Pacific Flatbill 337
Pacific Royal Flycatcher 345
Pacific Swallow 666
Pacific-slope Flycatcher 364
pacifica, Myiopagis viridicata 266
pacificus, Anthus rubescens 767
pacificus, Attila spadiceus 445
pacificus, Mionectes oleagineus 309
pacificus, Rhynchocyclus 337
Paddyfield Pipit 746
Painted Tody-flycatcher 334
palamblae, Mionectes striaticollis 308
Pale Crag Martin 673
Pale Martin 648
Pale Sand Martin 648
Pale-bellied Manakin 165
Pale-bellied Mourner 427
Pale-bellied Tyrant-manakin 165
Pale-edged Flycatcher 435
Pale-eyed Pygmy-tyrant 318
Pale-footed Swallow 659
Pale-throated Flycatcher 437
Pale-tipped Tyrannulet 312
pallatangae, Elaenia 273
pallens, Ammomanes cinctura 577
pallens, Hemitriccus minor 321
pallens, Myiopagis viridicata 266
pallens, Sublegatus arenarum 310
pallescens, Contopus cinereus 369
pallescens, Neopelma 165
pallescens, Tolmomyias sulphurescens 338
pallida, Galerida cristata 595
pallida, Lullula arborea 600
pallida, Mirafra africana 551
pallida, Petrochelidon fulva 684
pallida, Ptyonoprogne fuligula 673
pallida, Sayornis saya 374
pallida, Serpophaga hypoleuca 285
pallidiceps, Machaeropterus pyrocephalus 159
pallidiceps, Muscisaxicola rufivertex 400
pallidiceps, Phyllomyias griseiceps 261
pallididorsalis, Elaenia flavogaster 267
pallidior, Hirundinea ferruginea 353
pallidior, Mecocerculus leucophrys 280
palliditergum, Mecocerculus leucophrys 279
palliditinctus, Anthus similis 749
pallidiventris, Anthus 754
pallidiventris, Contopus pertinax 367
pallidiventris, Griseotyrannus aurantioatrocristatus 416
pallidiventris, Mionectes oleagineus 309
pallidiventris, Myiozetetes similis 407
pallidiventris, Platyrinchus saturatus 340
pallidus, Contopus 370
pallidus, Mionectes olivaceus 308
pallidus, Myiarchus tuberculifer 432
pallidus, Myiotheretes striaticollis 389
pallidus, Rhynchocyclus brevirostris 337
palloris, Phylloscartes superciliaris 301
Paltry Tyrannulet 295
paludibula, Riparia paludicola 647
paludicola, Riparia 647
Panama Flycatcher 433
panamensis, Cnipodectes subbrunneus 345
panamensis, Myiarchus 433
panamensis, Philohydor lictor 409
panamensis, Schiffornis turdina 168
panamensis, Tyrannulus elatus 262
Pangani Longclaw 773
paraensis, Iodopleura isabellae 87
paraensis, Tolmomyias assimilis 339
parambae, Attila spadiceus 445
parambae, Myiopagis caniceps 265
Paramo Ground-tyrant 401
Paramo Pipit 761
paraquensis, Knipolegus poecilurus 378
parcus, Mionectes oleagineus 309
pareola, Chiroxiphia 138, 152
pariae, Leptopogon superciliaris 307
pariae, Pipreola formosa 84
pariae, Pyrrhomyias cinnamomeus 353
parkeri, Phylloscartes 301
parsonsi, Hirundo neoxena 667
partridgei, Platyrinchus mystaceus 341
parui, Mecocerculus leucophrys 280
parui, Pachyramphus castaneus 455
parulus, Anairetes 190, 282
parva, Mirafra javanica 543
parvirostris, Ammomanes deserti 578
parvirostris, Attila spadiceus 445
parvirostris, Colorhamphus 384
parvirostris, Elaenia 269
parvirostris, Megarynchus pitangua 415
parvula, Riparia cincta 649
parvus, Anthus lutescens 759
parvus, Conopias 411
parvus, Zimmerius vilissimus 295
PASSERIFORMES 31
passerina, Mirafra 546
patae, Calendulauda barlowi 560
Patagonian Chat-tyrant 384
Patagonian Negrito 375
Patagonian Swallow 659
Patagonian Tyrant 384
patagonica, Notiochelidon cyanoleuca 659
patagonicus, Anairetes parulus 282
patriciae, Motacilla cinerea 785
paulista, Phylloscartes 253, 302
paulistus, Hemitriccus nidipendulus 324
paulus, Euscarthmus meloryphus 293
pax, Masius chrysopterus 155
payni, Ammomanes deserti 577
Pearl-breasted Swallow *629*, 669
Pearl-headed Manakin 148
Pearly-vented Tody-Tyrant *204*, 324
Pechora Pipit *738*, 765
pectorale, Ramphotrigon megacephalum 443
pectoralis, Polystictus 250, 288
pekinensis, Alauda arvensis 598
pelodoma, Hirundo fulva 684
pelopus, Anthus 763
Pelzeln's Flycatcher 432
Pelzeln's Tody-tyrant 324
pelzelni, Elaenia 271
pelzelni, Myiarchus swainsoni 432
pelzelni, Pseudotriccus 290
pelzelni, Tityra inquisitor 449
penardi, Poecilotriccus fumifrons 331
penduliger, Cephalopterus 40, 102
penicillata, Eremophila alpestris 589
peninsulae, Contopus sordidulus 368
pepoaza, Xolmis cinereus 393
percivali, Psalidoprocne pristoptera 643
perconfusa, Calandrella somalica 585
perconfusus, Motacilla flava 781
perdita, Petrochelidon 681
peregrina, Eremophila alpestris 589
perijana, Piprites chloris 167
perijanus, Myiophobus flavicans 346
perijanus, Platyrinchus mystaceus 341
Perissocephalus 103
Perissotriccus 316
pernix, Myiotheretes 389
perpallida, Ptyonoprogne fuligula 673
Persian Rock Pipit 749
persica, Calandrella rufescens 586
persica, Motacilla alba 777
personata, Motacilla alba 777
personata, Spizocorys 592
personata, Tityra semifasciata 449
perspicillatus, Hymenops 175, 375
pertinax, Contopus 367
pertinax, Myiarchus cinerascens 437
peruanum, Todirostrum cinereum 334
peruanus, Knipolegus poecilurus 378
peruanus, Mionectes macconnelli 310
peruanus, Pachyramphus xanthogenys 453
Peruvian Elaenia 268
Peruvian Martin 657
Peruvian Plantcutter 73
Peruvian Swallow 685
Peruvian Tody-tyrant 327
Peruvian Tyrannulet 297
peruviana, Notiochelidon cyanoleuca 659
peruvianus, Anthus lutescens 759
peruvianus, Leptopogon amaurocephalus 307
peruvianus, Masius chrysopterus 155
peruvianus, Myiobius villosus 351
peruvianus, Poecilotriccus ruficeps 329
peruvianus, Pseudotriccus pelzelni 290
peruvianus, Rupicola 35, *47*, *58*, *59*, *60*, *67*, 107
peruvianus, Tolmomyias sulphurescens 338
petersi, Zimmerius improbus 295
Petit's Roughwing 643
Petit's Saw-wing 643
petiti, Psalidoprocne pristoptera 644
petricolus, Anthus similis 749
Petrochelidon 681
petrosus, Anthus 699, *718*, *735*, 766
Pewee
  Blackish 371
  Crested Wood 356
  Cuban 370
  Dark 367
  Greater 367
  Greater Antillean 370
  Hispaniolan 370
  Jamaican 370
  Lesser Antillean *181*, 370
  Ochraceous 368
  Puerto Rican 370
  Smoke-coloured 368
  St Lucia 370
  Tropical 369
  Western 368
  White-throated 371
phaeocephalus, Myiarchus 435
phaeocercus, Mitrephanes 371
Phaeomyias 286
phaeonotus, Myiarchus swainsoni 432
Phaeoprogne 657
Phaeotriccus 377
Phedina 645
Phedinopsis 645
phelpsi, Oxyruncus cristatus 73
Phelpsia 408
Phibalura 79
philippinensis, Mirafra javanica 543
phillipsi, Anthus correndera 760
Philohydor 409
Phoebe
  Black 373
  Eastern 373
  Say's *205*, *210*, *249*, 374
  White-winged 373
phoebe, Sayornis 373
Phoenicircus 106
phoenicomitra, Myiophobus 346
phoenicura, Ammomanes 499, 577
phoenicuroides, Ammomanes deserti 578
phoenicurus, Attila 444
phoenicurus, Myiotriccus ornatus 315
Phyllomyias 259
Phylloscartes 299
Phytotoma 73
pica, Fluvicola 209, 387

pictum, Todirostrum 334
Pied Wagtail 777
Pied Water-tyrant *209*, 387
Pied-crested Tit-tyrant 281
Pied-winged Swallow 669
pifanoi, Pogonotriccus poecilotis 303
Piha
  Chestnut-capped *33*, 88
  Cinnamon-vented *70*, 90
  Dusky 88
  Grey-tailed 88
  Olivaceous 88
  Rose-collared 90
  Rufous *38*, 89
  Scimitar-winged 89
  Screaming *51*, 89
pilaris, Atalotriccus 318
pileata, Notiochelidon 660
pileata, Piprites 140, 167
Pileated Flycatcher 356
pileatus, Leptopogon amaurocephalus 307
pileatus, Lophotriccus 178, 317
Pin-tailed Manakin *114*, 153
Pinarocorys 563
Pine Flycatcher 363
pinicola, Pyrocephalus rubinus 374
Pink-billed Lark 591
Pink-breasted Lark *514*, 558
Pink-throated Becard 461
Pink-throated Longclaw 774
pintoi, Mirafra rufocinnamomea 552
Pipit 686, 745
  African 746
  African Rock 756
  Alpine 758
  American 767
  American Rock 767
  American Water 767
  Australasian *690*, *719*, 745
  Australian 745
  Bannerman's 749
  Berthelot's 755
  Blyth's 750
  Brachystegia 748
  Brown Rock 749
  Brown Tree 765
  Buff-bellied 767
  Buffy 753
  Bush 768
  Bushveld 768
  Cameroon 746
  Canarian 755
  Canary Islands 755
  Chaco 760
  Chapin's 748
  Chinese 754
  Common 745
  Correndera *696*, 760
  Eurasian Tree 765
  European Rock 766
  Godlewski's 750
  Golden *694*, 771
  Grassland 746
  Grassveld *691*, *696*, *730*, 746
  Hellmayr's *700*, *708*, 761
  Hodgson's 764
  Hodgson's Tree 764
  Indian 746, 754
  Indian Long-billed 749
  Indian Rock 749
  Indian Tree 764
  Jackson's 747
  Kerala Rock 749
  Kimberley 749
  Large Striped 755
  Large Yellow-tufted 756
  Little Tawny 768
  Long-billed *736*, 749
  Long-legged 754
  Long-tailed *686*, 753
  Malindi 755
  Meadow *695*, 763
  Menzbier's 765
  Moco 749
  Mountain 747, 758, 766
  New Guinea *697*, 758
  New Zealand 745
  Nilgiri *741*, 754
  Ochre-breasted *742*, 761
  Olive Tree 764
  Olive-backed *701*, 764
  Oriental 746, 754
  Oriental Tree 764
  Paddyfield 746
  Paramo 761
  Pechora *738*, 765
  Persian Rock 749
  Plain-backed 753
  Red-throated *712*, *717*, *727*, *728*, 764
  Richard's *688*, 745
  Rock *699*, *718*, *735*, 756, 766
  Rose-breasted 763
  Roseate 763
  Rosy *698*, 763
  Rufous Rock 749
  Sandy 753
  Sandy Plain-backed 753
  Scandinavian Rock 766
  Sharpe's 771
  Short-billed 759
  Short-tailed 768
  Siberian 765, 767
  Siberian Tree 764
  Siberian Water 767
  Sokoke 768
  South Georgia *741*, 760
  Spotted 764
  Sprague's *743*, 759
  Striped *716*, 755
  Subantarctic 760
  Tawny *714*, 750
  Tree *714*, *720*, 765
  Upland *698*, 754
  Vinaceous-breasted 763
  Water *699*, 766
  Wood 748
  Woodland *731*, 748
  Yellow-bellied 771
  Yellow-breasted 771
  Yellow-tufted 756
  Yellowish 759
  Yellowish-bellied 771
Pipra 143
pipra, Dixiphia 123, 151
pipra, Iodopleura 39, *71*, 87
Pipreola 80
PIPRIDAE 110, 143
Piprites 166
Piprites
  Black-capped *140*, 167
  Grey-headed 166
  White-winged 167
  Wing-barred *119*, 167
Pipromorpha 309, 310
Piratic Flycatcher 406
pispoletta, Calandrella 585
pitangua, Megarynchus 247, 415
Pitangus 408
Piura Chat-tyrant 384
piurae, Ochthoeca 384
piurae, Pyrocephalus rubinus 374
placens, Myiopagis viridicata 266
Plain Becard 461
Plain Martin 647
Plain Sand Martin 647
Plain Tyrannulet 311
Plain-backed Pipit 753
Plain-capped Ground-tyrant 401
Plain-crested Elaenia *223*, 271
Planalto Tyrannulet *176*, 259
Plantcutter
  Bolivian 74
  Chilean 74
  Peruvian 73
  Red-breasted 74
  Reddish 74
  Rufous-tailed *49*, *61*, 74
  White-tipped *33*, *61*, 74
Platypsaris 460, 461
platyrhynchos, Platyrinchus 342
platyrhynchus, Myiarchus tuberculifer 432
Platyrinchus 340
plebeja, Calendulauda sabota 558
plengei, Anairetes agraphia 283
plexa, Motacilla flava 781
Plum-throated Cotinga *36*, 94
plumbeiceps, Phyllomyias 261
plumbeiceps, Poecilotriccus 230, 331
Plumbeous Andean Tyrant 377
Plumbeous Tyrant 377
Plumbeous-crowned Tody-flycatcher 330
Plumbeous-crowned Tyrannulet 261
poecilocercus, Knipolegus 377
poecilocercus, Mecocerculus 279
poeciloma, Petrochelidon fulva 684
poecilonota, Colonia colonus 405
poecilosterna, Calendulauda 514, 558
poecilotis, Pogonotriccus 303
Poecilotriccus 329
poecilurus, Knipolegus 378
poensis, Psalidoprocne fuliginosa 643
Pogonotriccus 303
polatzeki, Calandrella rufescens 585
poliocephalum, Todirostrum 333
poliocephalus, Leptopogon superciliaris 307
poliocephalus, Mionectes striaticollis 308
poliocephalus, Tolmomyias 339
poliogastra, Ochthoeca rufipectoralis 382
polionota, Ochthoeca oenanthoides 383
Polioxolmis 391
polychopterus, Pachyramphus 243, 456
Polymorphic Attila 445
Polystictus 288
Pompadour Cotinga *36*, 97
pompalis, Tyrannus crassirostris 421
Ponderosa Flycatcher 365
ponens, Anthus petrosus 766
Porphyrolaema 93
porphyrolaema, Porphyrolaema 93
portoricensis, Contopus latirostris 370
portovelae, Myiobius atricaudus 352
praetermissa, Galerida theklae 596
pratensis, Anthus 695, 763
praticola, Eremophila alpestris 589
presaharica, Ptyonoprogne fuligula 673
pretoriae, Ptyonoprogne fuligula 673
Preuss's Cliff Swallow 681
Preuss's Swallow 681
preussi, Petrochelidon 681
primarius, Anthus similis 749
primulus, Myiozetetes similis 407
Prince Albert Lyrebird 494
Prince Albert's Lyrebird 494
Prince Edward Lyrebird 495
pristoptera, Psalidoprocne 634, 643
Procnias 104
Progne 655
propinqua, Galerida malabarica 597
prunus, Anthus leucophrys 753
Przewalski's Lark 589
przewalskii, Eremophila alpestris 589
Psalidoprocne 643
psammochroa, Melanocorypha calandra 579
psammochroa, Stelgidopteryx serripennis 661
Pseudalaemon 593
Pseudattila 444
Pseudelaenia 294
Pseudhirundo 644
pseudobaetica, Calandrella rufescens 586
Pseudochelidon 641
Pseudocolopteryx 289
pseudosimilis, Anthus 749
Pseudotriccus 290
ptaritepui, Platyrinchus mystaceus 341
Ptyonoprogne 673
pudica, Elaenia frantzii 272
puella, Cecropis abyssinica 676
Puerto Rican Flycatcher 440
Puerto Rican Pewee 370
puertoricensis, Petrochelidon fulva 684
puii, Calandrella brachydactyla 583
pulchella, Ochthoeca 381
pulchellus, Poecilotriccus 333
pulcher, Myiophobus 347
pulchra, Pipreola 83
pulpa, Mirafra 547
pulverius, Empidonax affinis 363
Puna Ground-tyrant 399
punensis, Contopus cinereus 369
punicea, Xipholena 36, 97
punjaubi, Alauda gulgula 599
purissimus, Manacus manacus 157
Purple Martin *638*, 655
Purple-breasted Cotinga 94
Purple-throated Cotinga 93
Purple-throated Fruitcrow *52*, 101
Purpletuft
  Buff-throated *39*, *71*, 87
  Dusky 87
  White-browed 87
purpurata, Querula 52, 101
purus, Manacus manacus 157
purus, Pogonotriccus ophthalmicus 304
purusiana, Pipra fasciicauda 143
purusianus, Terenotriccus erythrurus 352
pusilla, Ptyonoprogne fuligula 673
pusillum, Camptostoma obsoletum 275
pygmaea, Dixiphia pipra 151
pygmaea, Motacilla flava 781
pygmaeus, Empidonax fulvifrons 365
Pygmy Spike-heeled Lark 564
Pygmy-tyrant
  Black-capped 316
  Bronze-olive 290
  Brown-breasted 321
  Double-banded 318
  Drab-breasted 321
  Eared *187*, 315
  Flammulated 322
  Fork-tailed *256*, 328
  Golden-scaled 318
  Hazel-fronted 290
  Helmeted 318
  Johannes's 323
  Long-crested 317
  Pale-eyed 318
  Rufous-edged 289, 294
  Rufous-headed *176*, 290
  Rufous-sided *252*, 294
  Scale-crested *178*, 317
  Short-tailed *246*, 316
  Tawny-crowned 293
  White-bellied 316
  White-breasted 316
  White-eyed 318
Pygochelidon 659
Pyrocephalus 374
pyrocephalus, Machaeropterus 159
Pyroderus 101
Pyrope 393
pyrope, Xolmis 393
Pyrrhomyias 353
pyrrhonota, Petrochelidon 618, *624*, *626*, 683
pyrrhops, Hemitriccus granadensis 327
pyrrhopterus, Pyrrhomyias cinnamomeus 353

Q

quassitrix, Motacilla citreola 782
Queen Victoria Lyrebird 495
Querula 101
querulus, Myiarchus tuberculifer 432
quesadae, Muscisaxicola alpinus 401
quiescens, Sayornis saya 374
quimarinus, Pachyramphus homochrous 461

R

raddei, Motacilla flava 781
raimondii, Phytotoma 73
Ramphocoris 578
Ramphotrigon 443
randoni, Galerida cristata 595
rara, Phytotoma 49, *61*, 74
Raso Lark *541*, 600
Raso Short-toed Lark 600
Raytal Lark 586
raytal, Calandrella 586
Raza Lark 600
razae, Alauda 541, 600
Razocorys 600
Red Cock-of-the-rock 107
Red Cotinga 106, 107
Red Lark *528*, *539*, 559
Red Sea Cliff Swallow 681
Red Sea Swallow 681
Red Somali Lark 548, 551
Red-backed Lark 560
Red-banded Fruiteater 84
Red-billed Tyrannulet 296
Red-breasted Fruitcrow 101
Red-breasted Plantcutter 74
Red-breasted Swallow 676
Red-capped Lark *536*, 583
Red-capped Manakin *125*, *129*, 144
Red-chested Swallow 666
Red-crested Cotinga *40*, 74
Red-headed Manakin *126*, 144
Red-ruffed Fruitcrow *45*, 101
Red-rumped Bush-tyrant *191*, 390
Red-rumped Ground-tyrant 390
Red-rumped Swallow *604*, *632*, 677
Red-tailed Lark 563
Red-throated Cliff Swallow 681
Red-throated Pipit *712*, *717*, *727*, *728*, 764
Red-throated Rock Martin 673
Red-throated Swallow 681
Red-winged Bushlark 548
Red-winged Lark *509*, 543, 548
Reddish Plantcutter 74
Redwoods Flycatcher 364
Reed Becard 453
regalis, Lepidothrix coronata 147
regina, Chiroxiphia pareola 152
reguloides, Anairetes 281
regulus, Machaeropterus 159
reichenowi, Psalidoprocne pristoptera 644
reischeki, Anthus novaeseelandiae 745
Reiser's Tyrannulet 260
reiseri, Phyllomyias 260
remota, Elaenia martinica 267
remseni, Doliornis 34, 75
Restinga Tyrannulet 299
restricta, Myiopagis viridicata 266
retrusa, Galerida cristata 595
reynoldsi, Mirafra fasciolata 553
Rhamphocorys 578
rhizophorae, Tachycineta albilinea 651
rhizophorus, Contopus cinereus 369
rhododendri, Anthus gutturalis 758
Rhynchocyclus 337
Rhytipterna 426
Richard's Pipit *688*, 745
richardi, Anthus 688, 745
Ridgway's Cotinga 93
Ridgway's Rough-winged Swallow 661
ridgwayi, Camptostoma imberbe 275
ridgwayi, Cotinga 69, 93

ridgwayi, Myiobius atricaudus 352
ridgwayi, Nesotriccus 287
ridgwayi, Stelgidopteryx serripennis 661
ridleyana, Elaenia 253, 268
riefferii, Pipreola 37, 80
Rifleman *465*, *467*, *469*, 472
Alpine 472
North Island 472
South Island 472
Rifleman Wren 472
riggenbachi, Galerida cristata 595
riisii, Elaenia martinica 267
rineyi, Xenicus gilviventris 473
Ringed Antpipit *177*, 293
Riparia 647
riparia, Riparia 611, *620*, *630*, *635*, 647
risora, Alectrurus 255, 389
River Tyrannulet 285
Riverside Tyrant 378
rixosa, Machetornis 183, *228*, 405
robertsi, Chersomanes albofasciata 564
robusta, Motacilla cinerea 785
rochei, Mirafra somalica 548
Rock Martin 673
Rock Pipit *699*, *718*, *735*, 756, 766
Rock Swallow 681
Rock Wren *466*, *471*, 473
rogersi, Anthus novaeseelandiae 745
roquettei, Phylloscartes 257, 302
roraimae, Mecocerculus leucophrys 280
roraimae, Mionectes macconnelli 310
roraimae, Myiophobus 347
Roraiman Elaenia 274
Roraiman Flycatcher 347
Rose-breasted Pipit 763
Rose-collared Piha 90
Rose-throated Becard 460
Roseate Pipit 763
roseatus, Anthus 698, 763
rosenbergi, Rhytipterna holerythra 427
rosenbergi, Schiffornis turdina 168
rostrata, Mirafra africana 551
Rosy Pipit *698*, 763
Rosy-breasted Longclaw *702*, *715*, 774
Rosy-throated Longclaw 774
rothschildi, Hemitriccus zosterops 322
rothschildi, Hirundo lucida 666
Rough-legged Tyrannulet 259
Rough-winged Swallow 661, 662
Round-tailed Manakin 145
Roughwing
Black 643
Brown 643
Fantee 644
Fanti 644
Mountain 643
Petit's 643
White-headed 643
Roughwing Swallow 643
Royal Flycatcher *179*, 345
rubea, Eremophila alpestris 589
rubellula, Ochthoeca diadema 382
rubescens, Anthus 767
rubetra, Xolmis 394
rubicundula, Ochthoeca rufipectoralis 382
rubicundus, Empidonax fulvifrons 365
rubidior, Calendulauda africanoides 558
rubidior, Pipreola formosa 84
rubiginosa, Calandrella brachydactyla 583
rubinus, Pyrocephalus 181, 374
rubrigastra, Tachuris 196, *225*, 315
rubrocapilla, Pipra 126, 144
rubrocristatus, Ampelion 40, 74
Rudd's Lark *541*, 557
Rudd's Long-clawed Lark 557
ruddi, Heteromirafra 541, 557
Ruddy Tody-flycatcher 330
Ruddy-tailed Flycatcher 352
rufa, Lessonia 201, 375
rufa, Menura alberti 494
rufa, Mirafra 546
rufaxilla, Ampelion 75
rufescens, Anthus 754
rufescens, Atrichornis 475, *478*, 482
rufescens, Calandrella 585
rufescens, Laniocera 446
rufescens, Melanocorypha bimaculata 579
rufescens, Mirafra javanica 543
rufescens, Muscisaxicola maculirostris 399
rufescens, Myiophobus fasciatus 348
Rufescent Flycatcher 348
ruficauda, Ramphotrigon 443
ruficeps, Elaenia 272
ruficeps, Poecilotriccus 329
ruficeps, Pseudotriccus 176, 290
ruficollis, Stelgidopteryx 662
ruficolor, Galerida theklae 596
rufigenis, Poecilotriccus ruficeps 329
rufigula, Petrochelidon 681
rufigula, Ptyonoprogne fuligula 673
rufigularis, Hemitriccus 328
rufinus, Empidonomus varius 416
rufipectoralis, Ochthoeca 382
rufipectus, Leptopogon 307, 308
rufipennis, Myiophobus roraimae 347
rufipennis, Myiozetetes cayanensis 406
rufipennis, Pitangus sulphuratus 409
rufipennis, Polioxolmis 391
rufipes, Hemitriccus margaritaceiventer 324
rufipilea, Mirafra 553
rufiventris, Mionectes 232, 310
rufiventris, Neoxolmis 391
rufivertex, Muscisaxicola 400
rufocinnamomea, Mirafra 552
rufocollaris, Petrochelidon 685
rufogularis, Anthus cervinus 764
rufomarginatus, Euscarthmus 252, 294
rufomarginatus, Mecocerculus leucophrys 280
rufopectus, Ochthoeca rufipectoralis 382
Rufous Attila 445
Rufous Bushlark 547
Rufous Casiornis *208*, 428
Rufous Flycatcher 431
Rufous Lark 547
Rufous Mourner 427
Rufous Piha *38*, 89
Rufous Rock Pipit 749
Rufous Sand Lark 585
Rufous Schiffornis 168
Rufous Scrub-bird *475*, *478*, 482
Rufous Short-toed Lark 583, 585
Rufous-backed Negrito 375
Rufous-bellied Bush-tyrant 390
Rufous-bellied Swallow 678
Rufous-breasted Chat-tyrant 382
Rufous-breasted Flycatcher 307
Rufous-breasted Leptopogon 307
Rufous-browed Tyrannulet 301
Rufous-chested Swallow 676
Rufous-crowned Elaenia 272
Rufous-crowned Tody-flycatcher 329
Rufous-crowned Tody-tyrant 329
Rufous-edged Pygmy-tyrant 289, 294
Rufous-headed Pygmy-tyrant *176*, 290
Rufous-lored Tyrannulet 301
Rufous-naped Ground-tyrant 400
Rufous-naped Lark *521*, *523*, *526*, 551
Rufous-rumped Bushlark 563
Rufous-rumped Lark 563
Rufous-sided Pygmy-tyrant *252*, 294
Rufous-tailed Attila 444
Rufous-tailed Desert Lark 577
Rufous-tailed Finch-Lark 577
Rufous-tailed Flatbill 443
Rufous-tailed Flycatcher 439
Rufous-tailed Lark *499*, 577
Rufous-tailed Plantcutter *49*, *61*, 74
Rufous-tailed Tyrant 378
Rufous-webbed Bush-tyrant 391
Rufous-webbed Ground-tyrant 391
Rufous-webbed Tyrant 391
Rufous-winged Bushlark 543, 544
Rufous-winged Lark 544
Rufous-winged Tyrannulet 280
rufula, Cecropis daurica 677
rufuloides, Anthus cinnamomeus 746
rufulus, Anthus 746
rufus, Attila 185, 445
rufus, Casiornis 208, 428
rufus, Pachyramphus 455
rukwensis, Mirafra albicauda 545
rupestris, Ptyonoprogne 608, 673
Rupicola 107
rupicola, Rupicola 42, *65*, 107
Rush-tyrant
Many-coloured *196*, *225*, 315
russatus, Poecilotriccus 330
Russet Tody-flycatcher 330
Russet-winged Spadebill 342
Rustic Swallow 665
rustica, Hirundo 604, *610*, *617*, *631*, 665
Rusty Bushlark 546
Rusty Lark 546
Rusty-backed Monjita 394
Rusty-fronted Tody-flycatcher 331
Rusty-margined Flycatcher *200*, 406
Rusty-tailed Flycatcher 438
Rusty-winged Bushlark 543
Rusty-winged Lark 543
rutila, Phytotoma 33, *61*, 74
ruwenzori, Psalidoprocne pristoptera 644
ruwenzoria, Mirafra africana 551

S

Sabota Lark *524*, 558
sabota, Calendulauda 524, 558
sabotoides, Calendulauda sabota 558
Sad Flycatcher 431
sadiecoatsae, Myiophobus roraimae 347
Saffron-crested Manakin 165
Saffron-crested Tyrant-manakin *121*, 165
Sagon Lark 547
sagrae, Myiarchus 184, 439
sala, Alauda gulgula 599
saldanhae, Calendulauda albescens 560
salinarum, Xolmis 252, 394
Salinas Monjita *252*, 394
salomonseni, Anthus trivialis 765
salvadorensis, Attila spadiceus 445
Salvin's Negrito 375
salvini, Empidonax flavescens 365
salvini, Knipolegus poecilurus 378
salvini, Pachyramphus albogriseus 459
salvini, Tumbezia 381
samharensis, Ammomanes deserti 578
samveasnae, Motacilla 687, 779
sanctaeluciae, Lophotriccus pileatus 317
sanctaeluciae, Myiarchus oberi 440
sanctaemartae, Tyrannus savana 425
Sand Lark 559, 577, 586
Sandy Pipit 753
Sandy Plain-backed Pipit 753
sanguinolentus, Rupicola peruvianus 107
Santa Marta Bush-tyrant 389
Sao Paulo Tyrannulet *253*, 302
Sapayoa 167
Sapayoa
Broad-billed *111*, 167
saphiroi, Anthus vaalensis 753
sarayacuensis, Corythopis torquatus 293
sarwensis, Calendulauda africanoides 558
Satrapa 387
satrapa, Tyrannus melancholicus 419
saturata, Ammomanes deserti 578
saturata, Hirundo rustica 665
saturata, Pipra fasciicauda 143
saturatior, Calandrella cinerea 583
saturatior, Cecropis senegalensis 677
saturatus, Contopus sordidulus 368
saturatus, Myiophobus fasciatus 348
saturatus, Pachyramphus castaneus 455
saturatus, Platyrinchus 178, 340
saturatus, Pyrocephalus rubinus 374
saturatus, Rupicola peruvianus 107
savana, Tyrannus 215, *239*, 425
savannophilus, Euscarthmus rufomarginatus 294
savignii, Hirundo rustica 665
Saw-wing
Black *634*, 643
Blanford's 643
Blue 643
Brown 643
Cameroon 643
Cameroon Mountain 643
Congo 643
Eastern 643
Ethiopian 643
Fanti 644
Fork-tailed 643
Kaffa 643
Mangbettu 643
Mountain 643
Petit's 643
Shari 643
Square-tailed 643
Western 643
White-headed 643
Say's Phoebe *205*, *210*, *249*, 374
saya, Sayornis 205, *210*, *249*, 374
Sayornis 373
Scale-crested Pygmy-tyrant *178*, 317
Scaled Fruiteater *44*, 84
Scandinavian Rock Pipit 766
scarlatina, Pipra fasciicauda 143
Scarlet-breasted Fruiteater 83
Scarlet-horned Manakin *120*, 145
schaeferi, Myiobius villosus 351
Schiffornis 168
Schiffornis
Brown 168
Greater 168
Greenish 168
Rufous 168
Thrush-like 168
schistaceiceps, Poecilotriccus sylvia 332
schlueteri, Anthus trivialis 765
schmitzi, Motacilla cinerea 785
schoensis, Riparia paludicola 647
schoutedeni, Anthus nyassae 748
schoutedeni, Mirafra rufocinnamomea 552
schulzi, Poecilotriccus sylvia 332
Scimitar-winged Cotinga 89
Scimitar-winged Piha 89
Scissor-tailed Flycatcher *184*, 424
Sclater's Lark 592
Sclater's Manakin 151
Sclater's Short-toed Lark 592
Sclater's Tyrannulet 260
sclateri, Attila spadiceus 445
sclateri, Camptostoma obsoletum 275
sclateri, Doliornis 75
sclateri, Hirundinea ferruginea 353
sclateri, Knipolegus orenocensis 378
sclateri, Myiarchus oberi 440
sclateri, Phyllomyias 260
sclateri, Pseudocolopteryx 289
sclateri, Spizocorys 592
sclateri, Tachycineta euchrysea 650
sclateri, Todirostrum cinereum 334
sclateri, Tolmomyias poliocephalus 339
scotica, Alauda arvensis 598
Screaming Piha *51*, 89
Scrub-bird 474, 482
Eastern 482
Noisy *477*, *479*, *480*, *481*, 482
Rufous *475*, *478*, 482
Western 482
Scrub-flycatcher
Amazonian 311
Northern 310
Smooth 310
Southern 311
Todd's 311
Scutated Fruitcrow 101
scutatus, Pyroderus 45, 101
Seaboard Flycatcher 431
secunda, Mirafra javanica 543
sedentaria, Galerida magnirostris 598
seebohmi, Calandrella rufescens 586
selbii, Tityra inquisitor 449
selvae, Mionectes striaticollis 308
semiatra, Sayornis nigricans 373
semifasciata, Tityra 172, *236*, 449
semiflava, Capsiempis flaveola 287
semiflavum, Ornithion 274
semiflavus, Myiobius barbatus 351
semipagana, Elaenia flavogaster 267
semirufa, Cecropis 676
semirufus, Myiarchus 431
semitorquata, Certhilauda 565
senectus, Poecilotriccus latirostris 331
senegalensis, Cecropis 608, *625*, 677
senegallensis, Galerida cristata 595
senex, Platyrinchus platyrhynchos 342
senex, Poecilotriccus 330
separabilis, Dixiphia pipra 151
Sepia-capped Flycatcher *231*, 307
Sepia-capped Leptopogon 307
sepikiana, Mirafra javanica 543
septentrionalis, Empidonomus varius 416
septentrionalis, Hemitriccus margaritaceiventer 324
septentrionalis, Myiozetetes luteiventris 408
serena, Lepidothrix 136, 148
serlei, Mirafra rufocinnamomea 552
Serpophaga 285
Serra do Mar Tyrannulet *251*, 303
Serra do Mar Tyrant-manakin 166
Serra Tyrant-manakin *118*, 166
serripennis, Stelgidopteryx 611, *622*, 661
setophagoides, Mecocerculus leucophrys 280
Shari Saw-wing 643
Sharp-tailed Grass-tyrant 287
Sharp-tailed Tyrant *251*, 287
Sharpbill *32*, *53*, 73
Sharpe's Longclaw *743*, 771
Sharpe's Pipit 771
sharpei, Hemimacronyx 743, 771
sharpii, Mirafra africana 551
Shear-tailed Grey Tyrant 402
shelleyi, Riparia riparia 647
shiptoni, Anthus bogotensis 761
Shore Lark 589
Short-billed Pipit 759
Short-clawed Bushlark 566
Short-clawed Lark 566
Short-crested Flycatcher 434
Short-crested Lark 597
Short-tailed Field-tyrant 405
Short-tailed Grey-headed Wagtail 781
Short-tailed Lark *511*, 593
Short-tailed Pipit 768
Short-tailed Pygmy-tyrant *246*, 316
Short-tailed Tody-flycatcher 334
Short-toed Lark 583
Shrike Cotinga 76
Shrike-like Cotinga 76
Shrike-tyrant
Black-billed *192*, 395
Great 395
Grey-bellied 396
Least 396
Lesser 396
Mouse-brown 396
White-tailed *254*, 395
Siberian Pipit 765, 767
Siberian Tree Pipit 764
Siberian Wagtail 781

Siberian Water Pipit 767
Siberian Yellow Wagtail 781
sibilator, Sirystes 427
sibiricus, Anthus trivialis 765
siccicola, Contopus sordidulus 368
Sick's Manakin 148
Sidamo Bushlark 557
Sidamo Lark *538*, 557
Sidamo Long-clawed Lark 557
sidamoensis, Heteromirafra 538, 557
sierrae, Alauda arvensis 598
sierrae, Eremophila alpestris 589
Sierran Elaenia 273
signata, Pipreola intermedia 80
signatum, Todirostrum maculatum 333
signatus, Eremopterix 573
signatus, Knipolegus 377
signatus, Terenotriccus erythrurus 352
Silvicultrix 381, 382
simile, Todirostrum chrysocrotaphum 335
similis, Anthus 736, 749
similis, Myiozetetes 212, 216, 407
similis, Ochthoeca pulchella 381
similis, Pachyramphus polychopterus 456
simillima, Motacilla flava 781
simplex, Mirafra cantillans 545
simplex, Pseudotriccus 290
simplex, Rhytipterna 173, 426
simplicissima, Motacilla capensis 784
Sinaloa Martin 656
sinaloae, Progne 656
sindiana, Mirafra erythroptera 543
sindzianicus, Motacilla citreola 782
sinensis, Anthus richardi 745
Singing Bushlark 543, 545
Singing Lark 545
sintaungensis, Ptyonoprogne concolor 674
sirintarae, Pseudochelidon 641
Sirystes 427
Sirystes 427
  Eastern 427
  Western 427
Skylark
  Cape Verde 600
  Common 598
  Eastern 599
  Eastern Small 599
  Eurasian *519*, *522*, *532*, 598
  European 598
  Indian 599
  Indian Small 599
  Japanese 598
  Lesser 599
  Little 599
  Mongolian 580
  Northern 598
  Oriental *506*, 599
  Small 599
Slate-headed Tody-flycatcher 332
Slaty Becard 454
Slaty Elaenia 271
Slaty Tody-flycatcher 332
Slaty-backed Chat-tyrant 382
Slaty-capped Flycatcher 307
Slaty-capped Leptopogon 307
Slender-billed Lark 585
Slender-billed Tyrannulet 311
Slender-footed Tyrannulet 297
Small House Swallow 666
Small Skylark 599
Small-billed Elaenia 269
Small-billed Tyrant 384
smithersi, Mirafra rufocinnamomea 552
smithi, Eremopterix leucotis 571
smithii, Hirundo 605, *636*, 668
Smoke-coloured Pewee 368
Smoky Bush-tyrant 390
Smoky-fronted Tody-flycatcher 331
Smooth Scrub-flycatcher 310
Snethlage's Tody-tyrant 321
Snethlagea 321
snethlageae, Hemitriccus minor 321
snethlagei, Myiobius atricaudus 352
Snow's Cotinga 90
Snow-capped Manakin 147
Snowornis 88
Snowy Cotinga *64*, 97
Snowy-bellied Martin 656
Snowy-throated Kingbird 419
sobatensis, Mirafra rufocinnamomea 552
Social Flycatcher *212*, *216*, 407
soderbergi, Mirafra javanica 543
Sokoke Pipit 768
sokokensis, Anthus 768
sokotrae, Anthus similis 749
solitarius, Agriornis montanus 395
solitarius, Myiodynastes maculatus 414
Somali Bushlark 551
Somali Lark 548, 551, 557
Somali Long-billed Bushlark 548
Somali Long-billed Lark 548
Somali Long-clawed Lark 557
Somali Short-toed Lark 585
somalica, Calandrella 585
somalica, Mirafra 548
somaliensis, Galerida cristata 595
Sooty Tyrannulet 285
Sooty-crested Tyrannulet 261
Sooty-crowned Flycatcher 435
Sooty-headed Tyrannulet 261
sordida, Elaenia obscura 273
sordidulus, Contopus 368
sordidus, Rhynchocyclus olivaceus 337
South African Cliff Swallow 681
South African Long-clawed Lark 557
South African Swallow 681
South Georgia Pipit *741*, 760
South Island Bush Wren 473
South Island Rifleman 472
South Island Stout-legged Wren 466
South Island Wren 473
Southern Antpipit 293
Southern Beardless Tyrannulet *202*, 275
Southern Bentbill 317
Southern Bristle-tyrant 304
Southern Lark 547
Southern Martin *615*, 657
Southern Rough-winged Swallow 662
Southern Rufous-backed Negrito 375
Southern Scrub-flycatcher 311
Southern Singing Lark 547
Southern Suiriri Flycatcher 276
Southern Thick-billed Lark 598
Spadebill
  Cinnamon-crested *178*, 340
  Golden-crowned 341
  Mexican 340
  Russet-winged 342
  Stub-tailed 340
  White-crested 342
  White-throated *224*, 341
  Yellow-crested 341
  Yellow-throated 342
spadiceus, Attila 445
spadix, Pyrrhomyias cinnamomeus 353
Spangled Cotinga *35*, 94
Spanish Wagtail 781
Spanish Yellow Wagtail 781
Sparrow-lark
  Ashy-crowned *520*, 574
  Black-bellied 574
  Black-crowned *500*, *524*, 572
  Black-eared *534*, 571
  Chestnut-backed 571
  Chestnut-headed 573
  Fischer's 573
  Grey-backed 571, 572
  White-cheeked 571
  White-crested 572
  White-fronted 572
spatzi, Ptyonoprogne fuligula 673
Speckled Mourner 446
spectabilis, Elaenia 268
Spectacled Bristle-tyrant 304
Spectacled Tyrant *175*, 375
Spike-heeled Lark *518*, 564
spilodera, Petrochelidon 681
spinoletta, Anthus 699, 766
spixii, Pachyramphus polychopterus 456
Spizitornis 280, 281, 282, 283
Spizocorys 591
spleniata, Calandrella cinerea 584
spodionota, Ochthoeca frontalis 381
spodiops, Hemitriccus 321
spodiurus, Pachyramphus 454
Spot-billed Ground-tyrant 399
Spotted Pipit 764
Spotted Tody-flycatcher 333
Sprague's Pipit *743*, 759
spragueii, Anthus 743, 759
spurium, Anthus cinnamomeus 746
squamaecrista, Lophotriccus pileatus 317
squamigerus, Anairetes agraphia 283
squamipectus, Pipreola frontalis 84
Square-tailed Roughwing Swallow 643
Square-tailed Saw-wing 643
St Lucia Pewee 370
stabilior, Macronyx capensis 772
stabilis, Anthus cinnamomeus 746
stanfordi, Cecropis striolata 678
Stark's Lark *527*, 591
Stark's Short-toed Lark 591
starki, Spizocorys 527, 591
Stead's Bush Wren 473
stegmanni, Calandrella rufescens 586
steinbachi, Schiffornis turdina 168
steindachneri, Anthus novaeseelandiae 745
stejnegeri, Anthus gustavi 765
Stelgidopteryx 661
stellatus, Myiotriccus ornatus 315
stenorhyncha, Schiffornis turdina 168
Stephens Wren 465
Stewart Island Bush Wren 473
stictopterus, Mecocerculus 279
Stigmatura 294
stokesii, Xenicus longipes 473
Stolid Flycatcher 440
stolidus, Myiarchus 440
Stolzmann's Swallow 651
stolzmanni, Tachycineta 651
stolzmanni, Tyranneutes 118, 166
stonei, Cheramoeca leucosterna 645
straminea, Serpophaga subcristata 286
Strange-tailed Tyrant *255*, 389
Streak-eyed Wagtail 777
Streak-necked Flycatcher 308
Streak-throated Bush-tyrant 389
Streak-throated Swallow *624*, 682
Streaked Attila 445
Streaked Flycatcher *244*, 414
Streaked Swallow 675
Streamer-tailed Tyrant *218*, 402
strepera, Elaenia 271
streptophorus, Lipaugus 90
stresemanni, Mirafra africana 551
stresemanni, Zaratornis 75
Striated Swallow 678
striaticeps, Knipolegus 377
striaticeps, Pseudocolopteryx sclateri 289
striaticollis, Hemitriccus 323
striaticollis, Mionectes 308
striaticollis, Myiotheretes 389
strigata, Eremophila alpestris 589
striolata, Cecropis 678
striolatus, Machaeropterus 112, 159
Stripe-necked Tody-tyrant 323
Striped Manakin 159
Striped Pipit *716*, 755
Striped Swallow 676
strumpelli, Galerida modesta 597
stuarti, Stelgidopteryx serripennis 661
Stub-tailed Spadebill 340
stygium, Anthus lineiventris 755
suahelica, Riparia cincta 649
suavissima, Lepidothrix 111, 148
subalaris, Hirundo lucida 666
subalaris, Snowornis 88
Subantarctic Pipit 760
subaustralis, Anthus novaeseelandiae 745
subbrunneus, Cnipodectes 345
subcanescens, Sirystes sibilator 427
subcinerea, Myiopagis gaimardii 265
subcoronata, Certhilauda 566
subcristata, Serpophaga 285
subflava, Inezia 312
subfusca, Hirundo tahitica 667
subgrisea, Melanocorypha maxima 580
subis, Progne 638, 655
Sublegatus 310
submagna, Galerida cristata 595
subocularis, Macronyx aurantiigula 774
subpagana, Elaenia flavogaster 267
subpallida, Chersomanes albofasciata 564
subpallida, Pipra filicauda 143
subpersonata, Motacilla alba 777
subplacens, Myiopagis 266
subpurus, Manacus manacus 157
subrufescens, Mirafra javanica 543
subsessor, Mirafra erythrocephala 544
subsimilis, Tolmomyias flaviventris 340
subtaurica, Galerida cristata 595
subtorquatus, Corythopis torquatus 293
Subtropical Doradito 289
subtropicalis, Phyllomyias sclateri 260
suffusa, Chloropipo holochlora 160
suffusa, Psalidoprocne albiceps 643
suffusca, Calendulauda sabota 558
Suiriri 276
Suiriri Flycatcher 276
suiriri, Suiriri 276
sulphuratus, Pitangus 199, *213*, *248*, 408
Sulphur-bellied Flycatcher 413
Sulphur-bellied Manakin 165
Sulphur-bellied Tyrannulet 280
Sulphur-bellied Tyrant-Manakin 165
sulphurea, Tyrannopsis 189, 415
sulphureipygius, Myiobius 351
sulphureiventer, Neopelma 165
sulphurescens, Tolmomyias 229, 338
Sulphur-rumped Flycatcher 351
Sulphury Flycatcher *189*, 415
sumichrasti, Pachyramphus aglaiae 460
Sun Lark 597
Superb Lyrebird *485*, *486*, *487*, *490*, *491*, 495
superba, Menura 495
superciliaris, Leptopogon 307
superciliaris, Motacilla flava 781
superciliaris, Phylloscartes 301
superciliaris, Platyrinchus coronatus 341
superciliaris, Poecilotriccus sylvia 332
superciliaris, Polystictus 288
superciliosa, Ochthoeca fumicolor 383
superciliosus, Myiophobus flavicans 346
superflua, Galerida theklae 596
surinamensis, Contopus cinereus 369
surinamus, Pachyramphus 460
Swainson's Flycatcher 432
swainsoni, Myiarchus 432
swainsoni, Onychorynchus coronatus 345
Swallow 602, 641, 665
  African 666
  African Barn 666
  African Mosque 677
  African Wire-tailed 668
  American Barn 665
  American Cliff 683
  Andean 660
  Andean Cliff 660
  Andrew's 644
  Angola Cliff 681
  Angolan 666
  Angolan Rock 681
  Asian Wire-tailed 668
  Bahama 651
  Bank 647
  Barn *604*, *610*, *617*, *631*, 665
  Black-and-rufous 670
  Black-and-white 645
  Black-capped 660
  Black-collared 660
  Black-vented 677
  Blue 670
  Blue-and-white 659
  Brazza's 645
  Brown-bellied 659
  Cave 684
  Ceylon 677
  Chepen 651
  Chestnut-collared 685
  Chilean 652
  Chimney 665
  Cinnamon-throated 684
  Cliff *618*, *624*, *626*, 683
  Cloudforest 659
  Coast 666
  Coban 660
  Common 665
  Dusky 682
  Dusky Cliff 682
  Eastern 666
  Eastern Blue 670
  Eastern House 666
  Eastern Red-rumped 678
  Ecuadorian 685
  Egyptian 665
  Ethiopian 668
  Eurasian 665
  European 665
  Forest 682
  Forest Cliff 682
  Gambian 666
  Gambian Barn 666
  Golden 650
  Golden-rumped 677
  Greater Striated 678
  Greater Striped *612*, 675
  Grey-rumped *623*, 644
  Hill 666
  House 665, 666
  Indian 682
  Indian Cliff 682
  Kenya 644
  Larger Striated 678
  Larger Stripe-breasted 675
  Lesser Striated 677
  Lesser Striped *603*, 676
  Little Blue 669
  Lowland 677
  Mangrove 651
  Montane Blue *639*, 670
  Mosque *608*, *625*, 677, 678
  Mountain Roughwing 643
  Nile 665
  Nilgiri House 666
  North American Cliff 683
  Northern Rough-winged *611*, *622*, 661
  Oriental Mosque 678
  Pacific 666
  Pale-footed 659
  Patagonian 659
  Pearl-breasted *629*, 669
  Peruvian 685
  Pied-winged 669
  Preuss's 681
  Preuss's Cliff 681
  Red Sea 681
  Red Sea Cliff 681
  Red-breasted 676
  Red-chested 666
  Red-rumped *604*, *632*, 677

Red-throated 681
Red-throated Cliff 681
Ridgway's Rough-winged 661
Rock 681
Rough-winged 661, 662
Roughwing 643
Rufous-bellied 678
Rufous-chested 676
Rustic 665
Small House 666
South African 681
South African Cliff 681
Southern Rough-winged 662
Square-tailed Roughwing 643
Stolzmann's 651
Streaked 675
Streak-throated *624*, 682
Striated 678
Striped 676
Sykes's Striated 677
Tawny-headed 662
Tree *613*, *637*, 649
Tumbes 651
Violet-green *614*, *621*, 650
Welcome *606*, 667
West African 669, 677
West African Striated 677
West Peruvian 651
White-backed 645
White-banded *609*, 660
White-breasted 645
White-chinned 669
White-rumped 652
White-tailed 669
White-thighed 661
White-throated *633*, 667
White-throated Blue 669
White-winged *607*, *616*, 652
Wire-tailed *605*, *636*, 668
Yucatan Rough-winged 661
Swallow Flycatcher 353
Swallow-tailed Cotinga *63*, *67*, 79
Swallow-tailed Manakin 153
Swinhoe's Wagtail 777
Sykes's Crested Lark 597
Sykes's Lark 597
Sykes's Striated Swallow 677
Sykes's Wagtail 781
sylvanus, Anthus 698, 754
sylvia, Poecilotriccus 332
sylviolus, Phylloscartes 302
sylvivagus, Anthus lineiventris 755

T

tachina, Petrochelidon pyrrhonota 683
Tachuri
Bearded *250*, 288
Grey-backed 288
Tachuris 315
Tachycineta 649
tacitus, Contopus hispaniolensis 370
Taczanowski's Ground-tyrant 399
taczanowskii, Leptopogon 308
taczanowskii, Riparia riparia 647
taeniopterus, Mecocerculus stictopterus 279
Taeniotriccus 328
tahitica, Hirundo 666
taimuri, Ammomanes deserti 578
taivana, Motacilla flava 781
tallmanorum, Pipreola riefferii 80
Tallmans' Fruiteater 80
tamae, Zimmerius improbus 295
tamborensis, Rhynchocyclus olivaceus 337
tangutica, Calandrella rufescens 586
tantilla, Riparia paludicola 647
tapera, Progne 612, 657
tardinata, Galerida cristata 595
tardiusculus, Megarynchus pitangua 415
taupoensis, Anthus novaeseelandiae 745
Tawny Lark 597
Tawny Pipit *714*, 750
Tawny-breasted Flycatcher 351
Tawny-chested Flycatcher 355
Tawny-crowned Pygmy-tyrant 293
Tawny-headed Swallow 662
Tawny-rumped Tyrannulet 262
taylori, Tyrannus caudifasciatus 424
tectricialis, Ochthoeca rufipectoralis 382
Teleonema 143
teleschowi, Eremophila alpestris 589
Temminck's Horned Lark 590
Temminck's Lark *500*, 590
tenebrosus, Pachyramphus polychopterus 456
tenellus, Tmetothylacus 694, 771
tenuirostris, Galerida cristata 595
tenuirostris, Inezia 311
tenuirostris, Mitrephanes phaeocercus 371
tephridorsus, Anthus leucophrys 753
Tepui Manakin 148
Terenotriccus 352
tertia, Alaemon hamertoni 567
tertia, Laniocera rufescens 446
tertius, Macronyx croceus 772
testacea, Ammomanes phoenicura 577
texanus, Pitangus sulphuratus 409
texensis, Myiozetetes similis 407
thalassina, Tachycineta 614, *621*, 650
Thekla Lark *510*, *531*, *533*, 596
theklae, Galerida 510, *531*, *533*, 596
theresae, Anthus pratensis 763
theresae, Galerida theklae 596
theresae, Ptyonoprogne rupestris 673
theresae, Spizocorys sclateri 592
Thick-billed Kingbird 421
Thick-billed Lark *530*, 578, 598
thomsi, Galerida cristata 595
thoracica, Ochthoeca cinnamomeiventris 382
Three-striped Flycatcher 411
Three-wattled Bellbird *56*, 104
Thrush-like Manakin 168
Thrush-like Mourner *110*, 168
Thrush-like Schiffornis 168
thunbergi, Motacilla flava 781
thyellophilum, Camptostoma imberbe 275
Tibetan Lark *507*, 580
tibetana, Calandrella acutirostris 585
tibetana, Riparia diluta 648
tibialis, Neochelidon 661
ticehursti, Alauda arvensis 598
tigrina, Mirafra rufocinnamomea 552
Tijuca 90
timidus, Empidonax albigularis 361
timorensis, Mirafra javanica 543
timoriensis, Petrochelidon nigricans 683
timothei, Platyrinchus cancrominus 340
Tiny Tyrant-manakin 166
Tit-tyrant
Agile 282
Ash-breasted 281
Black-crested 280
Juan Fernandez *250*, 282
Maranon 280
Masatierra 282
Pied-crested 281
Tufted *190*, 282
Unstreaked 283
Yellow-billed 281
Tityra 449
Tityra
Black-crowned *220*, 449
Black-tailed 450
Masked *172*, *236*, 449
White-tailed 449
Tmetothylacus 771
tobagensis, Myiodynastes maculatus 414
Tobago Manakin 152
tocantinsi, Oxyruncus cristatus 73
Todd's Scrub-flycatcher 311
Todirostrum 333
Todybill 330
Tody-flycatcher
Black-and-white 330
Black-backed 333
Black-fronted 334
Black-headed 335
Borba 330
Buff-cheeked 330
Common *221*, 334
Golden-winged 333
Grey-headed 333
Maracaibo 334
Ochre-faced *230*, 331
Painted 334
Plumbeous-crowned 330
Ruddy 330
Rufous-crowned 329
Russet 330
Rusty-fronted 331
Short-tailed 334
Slate-headed 332
Slaty 332
Smoky-fronted 331
Spotted 333
White-cheeked 330
Yellow-browed *187*, 335
Yellow-lored 333
Tody-tyrant
Black-and-white 330
Boat-billed 322
Buff-breasted 327
Buff-cheeked 330
Buff-throated 328
Cinnamon-breasted 327
Eye-ringed *230*, 323
Fork-tailed 328
Grey-faced 321
Hangnest 324
Johannes's 323
Johnson's *172*, 329
Josephine's 322
Kaempfer's *257*, 328
Lesser 321
Lulu von Hagen's 329
Lulu's 329
Olivaceous 323
Pearly-vented *204*, 324
Pelzeln's 324
Peruvian 327
Rufous-crowned 329
Snethlage's 321
Stripe-necked 323
Tricoloured 330
White-bellied 323
White-cheeked 330
White-chested 330
White-eyed 322
Yungas 321
Zimmer's 324
Tolmomyias 338
torquata, Melanocorypha bimaculata 579
torquatus, Corythopis 177, 293
Torrent Tyrannulet *194*, 285
torrentium, Motacilla clara 786
torrida, Mirafra rufocinnamomea 552
torridus, Attila 444
tortugensis, Sublegatus arenarum 310
tovarensis, Ochthoeca diadema 382
Traill's Flycatcher 360
traillii, Empidonax 360
transandinus, Leptopogon superciliaris 307
transbaykalica, Riparia diluta 648
transcaspia, Alauda gulgula 599
transiens, Spizocorys conirostris 591
transitiva, Hirundo rustica 665
transvaalensis, Certhilauda semitorquata 565
transvaalensis, Mirafra africana 551
trapnelli, Calendulauda africanoides 558
travancoriensis, Anthus similis 749
Traversia 465
traylori, Anthus caffer 768
traylori, Tolmomyias 339
Tree Martin 683
Tree Pipit *714*, *720*, 765
Tree Swallow *613*, *637*, 649
Tree Wagtail 777
trepidus, Empidonax affinis 363
tricarunculatus, Procnias 56, 104
tricolor, Alectrurus 255, 388
tricolor, Perissocephalus 54, 103
tricolor, Poecilotriccus 330
Tricoloured Tody-tyrant 330
trinitatis, Manacus manacus 157
trinitatis, Myiopagis gaimardii 265
trinitatis, Pitangus sulphuratus 409
tristis, Pachyramphus polychopterus 456
trivialis, Anthus 714, *720*, 765
trivirgatus, Conopias 411
Tropical Kingbird *199*, 419
Tropical Pewee 369
tropicalis, Mirafra africana 551
Tschudi's Tyrannulet 297
tschudii, Ampelioides 44, 84
tschudii, Piprites chloris 167
tschutschensis, Motacilla flava 781
tuberculifer, Myiarchus 432
tucumana, Ochthoeca leucophrys 383
tucumanus, Phylloscartes ventralis 299
Tufted Flycatcher 371
Tufted Tit-tyrant *190*, 282
Tumbes Swallow 651
Tumbes Tyrannulet 286
Tumbes Tyrant 381
tumbezana, Phaeomyias murina 286
Tumbezia 381
turdina, Schiffornis 110, 168
Turkestan Black-headed Wagtail 781
turneri, Anthus leucophrys 753
Turquoise Cotinga *69*, 93
tuvinica, Calandrella rufescens 585
tweedi, Atrichornis rufescens 482
Twistwing
Brownish 345
tyawanoides, Menura 484
tyleri, Elaenia dayi 273
Tyranneutes 166
TYRANNIDAE 170, 259
Tyranniscus 259, 260, 261, 262, 295, 296, 297
Tyrannopsis 415
Tyrannulet
Alagoas 301
Amazonian 312
Ash-coloured 294
Ashy-headed 262
Bahia 299
Bananal 265
Bay-ringed 302
Black-capped 261
Black-fronted 300
Bolivian 296
Brown-capped 274
Buff-banded 279
Chapman's 303
Cinnamon-faced 301
Crested 261
Ecuadorian 300
Golden-faced 297
Greenish 259
Grey-and-white 294
Grey-capped 260
Grey-crowned 286
Ihering's 303
Loja 297
Long-tailed 301
Minas Gerais *257*, 302
Mishana *170*, 296
Mishima 296
Mistletoe 295
Mottle-cheeked 299
Mouse-coloured 286
Northern Beardless 275
Olive-green 300
Oustalet's 303
Pale-tipped 312
Paltry 295
Peruvian 297
Plain 311
Planalto *176*, 259
Plumbeous-crowned 261
Red-billed 296
Reiser's 260
Restinga 299
River 285
Rough-legged 259
Rufous-browed 301
Rufous-lored 301
Rufous-winged 280
Sao Paulo *253*, 302
Sclater's 260
Serra do Mar *251*, 303
Slender-billed 311
Slender-footed 297
Sooty 285
Sooty-crested 261
Sooty-headed 261
Southern Beardless *202*, 275
Sulphur-bellied 280
Tawny-rumped 262
Torrent *194*, 285
Tschudi's 297
Tumbes 286
Urich's 260
Venezuelan 295
White-banded 279
White-bellied 286
White-crested 285
White-fronted 259
White-lored 274
White-tailed 279
White-throated 279
Yellow *238*, 287
Yellow-bellied 274
Yellow-crowned 262
Yellow-green 300
Zeledon's 259
Tyrannulus 262
tyrannulus, Myiarchus 438
Tyrannus 419
tyrannus, Tyrannus 212, *241*, 422
Tyrant
Andean 377
Black-chested 328
Cattle *183*, *228*, 405
Chocolate-vented 391
Cinereous 377
Cinnamon *173*, 352
Cock-tailed *255*, 388
Lawrence's Bent-billed 317
Long-tailed *200*, 405
Many-coloured 315
Patagonian 384
Plumbeous 377
Plumbeous Andean 377
Riverside 378
Rufous-tailed 378
Rufous-webbed 391
Sharp-tailed *251*, 287
Shear-tailed Grey 402
Small-billed 384
Spectacled *175*, 375
Strange-tailed *255*, 389
Streamer-tailed *218*, 402
Tumbes 381
Yellow-browed 387
Tyrant-flycatcher 170, 259
Tyrant-manakin
Cinnamon 352
Dwarf *118*, 166
Pale-bellied 165

Saffron-crested *121*, 165
Serra *118*, 166
Serra do Mar 166
Sulphur-bellied 165
Tiny 166
Wied's 165
tytleri, Hirundo rustica 665

U

uis, Calendulauda sabota 558
ultima, Elaenia frantzii 272
Umbrellabird 102
Amazonian 102
Bare-necked *57*, *62*, 102
Long-wattled *40*, 102
Ornate 102
umbrosus, Manacus manacus 157
Unadorned Flycatcher 346
unica, Dixiphia pipra 151
unicolor, Chloropipo 160
uniformis, Chloropipo 160
unirufus, Lipaugus 38, 89
unitatis, Cecropis abyssinica 676
Unstreaked Tit-tyrant 283
Upland Pipit *698*, 754
urbicum, Delichon 619, *627*, 674
Urich's Tyrannulet 260
urichi, Phyllomyias 260
Uromyias 282, 283
uropygialis, Lipaugus 89
uropygialis, Pachyramphus major 459
uropygialis, Phyllomyias 262
uropygialis, Stelgidopteryx ruficollis 662
uropygiatus, Attila spadiceus 445
urubambae, Elaenia albiceps 268
urubambae, Ochthoeca leucophrys 383
ussuriensis, Anthus richardi 745
utahensis, Eremophila alpestris 589

V

vaalensis, Anthus 753
vagilans, Calandrella cinerea 583
validus, Myiarchus 439
validus, Pachyramphus 461
vamberyi, Galerida cristata 595
variabilis, Xenicus longipes 473
Variegated Bristle-tyrant 303
Variegated Flycatcher 416
variegatus, Legatus leucophaius 406
varius, Empidonomus 416
Varzea Mourner *120*, 168
vauriei, Calandrella raytal 586
velatus, Xolmis 237, 393
veliei, Contopus sordidulus 368
velutina, Lepidothrix coronata 147
Velvet Manakin 151
Velvety Black-tyrant *182*, 379
Velvety Manakin 147
venezuelae, Camptostoma obsoletum 275
Venezuelan Bristle-tyrant 305
Venezuelan Flycatcher 433
Venezuelan Tyrannulet 295
venezuelana, Serpophaga hypoleuca 285
venezuelanus, Knipolegus poecilurus 378
venezuelanus, Leptopogon rufipectus 308
venezuelanus, Myiophobus flavicans 346
venezuelanus, Pogonotriccus 305
venezuelense, Laniisoma elegans 76
venezuelense, Ramphotrigon megacephalum 443
venezuelensis, Atalotriccus pilaris 318
venezuelensis, Leptopogon superciliaris 307
venezuelensis, Mionectes olivaceus 309
venezuelensis, Myiarchus 433
venezuelensis, Terenotriccus erythrurus 352
ventralis, Phylloscartes 299
ventralis, Platyrinchus mystaceus 341
veraepacis, Schiffornis turdina 168
Vermilion Flycatcher *181*, 374
Vermilion-crowned Flycatcher 407
vernayi, Alauda gulgula 599
vernayi, Cecropis striolata 678
versicolor, Pachyramphus 454
verticalis, Eremopterix 572
verticalis, Tyrannus 186, 422
veseyfitzgeraldi, Calendulauda sabota 558
vetula, Muscipipra 402
Victoria Lyrebird 495
victoriae, Menura novaehollandiae 495
vidua, Motacilla aguimp 779
vieillotioides, Pyrrhomyias cinnamomeus 353
vigensis, Empidonax affinis 363
vilasboasi, Lepidothrix 140, 148
vilissimus, Zimmerius 295
villarejoi, Zimmerius 170, 296
villosus, Myiobius 351
Vinaceous-breasted Pipit 763
vincenti, Calendulauda africanoides 558
Violet-green Swallow *614*, *621*, 650
virens, Contopus 369
virescens, Empidonax 180, 359
virescens, Phyllomyias 259
virescens, Phylloscartes 300
virescens, Schiffornis 119, 168
virescens, Tyranneutes 166
viridanum, Todirostrum 334
viridicata, Myiopagis 266
viridicauda, Pipreola arcuata 80
viridiceps, Mionectes striaticollis 308
viridiceps, Phyllomyias burmeisteri 259
viridiceps, Poecilotriccus plumbeiceps 331
viridiceps, Tolmomyias flaviventris 340
virididorsale, Todirostrum cinereum 334
viridiflavus, Zimmerius 297
viridior, Chloropipo holochlora 160
viridis, Pachyramphus 186, 453
viridissimus, Zimmerius bolivianus 296
viridiventris, Manacus vitellinus 156
vitellinus, Manacus 130, *131*, 156
vitiosus, Lophotriccus 318
vividus, Mitrephanes phaeocercus 371
vividus, Platyrinchus flavigularis 342
vociferans, Lipaugus 51, 89
vociferans, Tyrannus 421
vorax, Tyrannus dominicensis 423
vulpecula, Calandrella somalica 585
vulturnus, Macronyx croceus 772

W

wagae, Phaeomyias murina 286
Wagtail 686, 745
African 779
African Pied *693*, *715*, *729*, 779
Alaska 781
Alaska Yellow 781
Amur 777
Angolan 784
Ashy-headed 781
Black-backed 777
Black-eared 777
Black-headed 781
Blue-headed 781
Blue-headed Yellow 781
British Pied 777
Cape *723*, 784
Citrine *705*, 782
Dark-headed 781
Eastern Yellow-headed 781
Egyptian Yellow 781
Forest *693*, *734*, 777
Green-crowned 781
Green-crowned Yellow 781
Green-headed 781
Green-headed Yellow 781
Grey *724*, *732*, *733*, *737*, *740*, 785
Grey-backed 786
Grey-headed 781
Hodgson's 777
Iberian 781
Iberian Yellow 781
Indian White 777
Japanese *704*, 778
Japanese Pied 777, 778
Kamchatka Pied 777
Kuril 781
Kuril Yellow 781
Large Pied 778
Long-tailed 786
Madagascar *704*, 785
Masked 777
Mekong *687*, 779
Moroccan 777
Mountain *707*, 786
Pied 777
Short-tailed Grey-headed 781
Siberian 781
Siberian Yellow 781
Spanish 781
Spanish Yellow 781
Streak-eyed 777
Swinhoe's 777
Sykes's 781
Tree 777
Turkestan Black-headed 781
Wells's 784
White *694*, *706*, *708*, *710*, *713*, *722*, *739*, 777
White-browed *709*, 778
White-chinned 781
White-faced 777
White-headed 781
Yellow *689*, *711*, *712*, *725*, *726*, 781
Yellow-browed 781
Yellow-crowned 781
Yellow-headed 781, 782
Yellow-hooded 782
Yellowish-crowned 781
Wagtail-tyrant
Greater 295
Lesser 294
waibeli, Calendulauda sabota 558
waitei, Anthus rufulus 746
wallacei, Mionectes oleagineus 309
wallacei, Procnias albus 105
wallacii, Schiffornis turdina 168
Warbling Doradito *198*, *242*, 289
warneri, Progne chalybea 656
Water Pipit *699*, 766
Water-tyrant
Black-backed *195*, 388
Drab 387
Ecuadorian 388
Masked 388
Pied *209*, 387
wattersi, Alauda gulgula 599
weberi, Lipaugus 33, 88
weigoldi, Alauda gulgula 599
weigoldi, Galerida cristata 595
weigoldi, Motacilla citreola 782
Welcome Swallow *606*, 667
Wells's Wagtail 784
wellsi, Motacilla capensis 784
werae, Motacilla citreola 782
West African Striated Swallow 677
West African Swallow 669, 677
West Peruvian Swallow 651
Western Flycatcher 364
Western House Martin 674
Western Kingbird *186*, 422
Western Pewee 368
Western Saw-wing 643
Western Scrub-bird 482
Western Singing Bushlark 545
Western Sirystes 427
Western Striped Manakin *112*, 159
Western Wood-pewee 368
wetmorei, Phyllomyias burmeisteri 259
wetmorei, Todirostrum cinereum 334
wettsteini, Lullula arborea 600
Whiskered Flycatcher *233*, 351
whistleri, Anthus pratensis 763
whitakeri, Ammomanes deserti 577
whitakeri, Galerida cristata 595
White Bellbird *55*, 105
White Cotinga 98
White Monjita *183*, 394
White Wagtail *694*, *706*, *708*, *710*, *713*, *722*, *739*, 777
White-backed Swallow 645
White-banded Swallow *609*, 660
White-banded Tyrannulet 279
White-bearded Flycatcher 408
White-bearded Manakin *128*, 157
White-bellied Leptopogon 307
White-bellied Martin 656
White-bellied Pygmy-tyrant 316
White-bellied Tody-tyrant 323
White-bellied Tyrannulet 286
White-bibbed Manakin 155
White-breasted Pygmy-tyrant 316
White-breasted Swallow 645
White-browed Chat-tyrant 383
White-browed Cotinga 87
White-browed Ground-tyrant 401
White-browed Purpletuft 87
White-browed Wagtail *709*, 778
White-cheeked Cotinga 75
White-cheeked Finch-lark 571
White-cheeked Sparrow-lark 571
White-cheeked Tody-flycatcher 330
White-cheeked Tody-tyrant 330
White-chested Tody-tyrant 330
White-chinned Swallow 669
White-chinned Wagtail 781
White-collared Manakin *134*, *135*, 156
White-crested Elaenia 268
White-crested Finch-lark 572
White-crested Spadebill 342
White-crested Sparrow-lark 572
White-crested Tyrannulet 285
White-crowned Manakin *123*, 151
White-eyed Attila 445
White-eyed Pygmy-tyrant 318
White-eyed River Martin 641
White-eyed Tody-tyrant 322
White-faced Wagtail 777
White-fronted Finch-lark 572
White-fronted Ground-tyrant *193*, 400
White-fronted Manakin *136*, 148
White-fronted Sparrow-lark 572
White-fronted Tyrannulet 259
White-headed Marsh-tyrant *195*, *227*, 388
White-headed Roughwing 643
White-headed Saw-wing 643
White-headed Wagtail 781
White-lored Tyrannulet 274
White-naped Xenopsaris 453
White-ringed Flycatcher 411
White-ruffed Manakin *115*, 155
White-rumped Monjita *237*, 393
White-rumped Swallow 652
White-tailed Bushlark 545
White-tailed Cotinga 97
White-tailed Lark 545, 546
White-tailed Shrike-tyrant *254*, 395
White-tailed Swallow 669
White-tailed Tityra 449
White-tailed Tyrannulet 279
White-thighed Swallow 661
White-throated Blue Swallow 669
White-throated Flycatcher 361
White-throated Kingbird 419
White-throated Manakin 155
White-throated Pewee 371
White-throated Spadebill *224*, 341
White-throated Swallow *633*, 667
White-throated Tyrannulet 279
White-tipped Plantcutter *33*, *61*, 74
White-winged Attila 445
White-winged Becard *243*, 456
White-winged Black-tyrant *219*, 379
White-winged Cotinga 97
White-winged Lark 580
White-winged Negrito 375
White-winged Phoebe 373
White-winged Piprites 167
White-winged Swallow *607*, *616*, 652
Whiteley's Flycatcher 432
whitelyi, Pipreola 84
Wied's Crested Flycatcher 438
Wied's Flycatcher 438
Wied's Manakin 165
Wied's Tyrant-manakin 165
wilcoxi, Atalotriccus pilaris 318
Williams's Bushlark 546
Williams's Lark 546
williamsi, Calandrella cinerea 583
williamsi, Mirafra 546
williamsoni, Mirafra javanica 543
Willow Flycatcher 360
Wing-barred Manakin 167
Wing-barred Piprites *119*, 167
winterbottomi, Anthus cinnamomeus 746
wintoni, Macronyx ameliae 774
Wire-tailed Manakin *127*, 143
Wire-tailed Swallow *605*, *636*, 668
Witherby's Lark 567
witputzi, Calandrella cinerea 583
wolfei, Alauda gulgula 599
wollastoni, Anthus gutturalis 758
woltersi, Calandrella brachydactyla 583
Wood Pipit 748
Wood-pewee
Eastern 369
Western 368
Woodland Pipit *731*, 748
Woodlark *515*, *529*, 600
woodwardi, Mirafra javanica 543
Wren
Bush 473
Fiordland Rock 473
Green 473
Long-billed 466
New Zealand 464, 472
North Island Bush 473
North Island Stout-legged 466
Rifleman 472
Rock *466*, *471*, 473
South Island 473
South Island Bush 473
South Island Stout-legged 466
Stead's Bush 473
Stephens 465
Stewart Island Bush 473
Wright's Flycatcher 362
wrightii, Empidonax 362
wuchereri, Hemitriccus margaritaceiventer 324

X

xanthogenys, Pachyramphus 453
Xanthomyias 259, 260
Xenicus 473
Xenopipo 160
Xenopsaris 453
Xenopsaris 453
White-naped 453
xenopterus, Tyrannus vociferans 421
Xenotriccus 356
xerica, Riparia cincta 649
xinguensis, Knipolegus orenocensis 378
Xipholena 97
Xolmis 393

Y

yaldwyni, Pachyplichas 466
yamethini, Anthus similis 749
Yanacea 281
yarrellii, Motacilla alba 777
yavelloensis, Spizocorys personata 592
Yellow Elaenia 266
Yellow Tyrannulet *238*, 287
Yellow Wagtail *689*, *711*, *712*, *725*, *726*, 781
Yellow-bellied Bristle-tyrant 301
Yellow-bellied Chat-tyrant 381
Yellow-bellied Elaenia *240*, 267
Yellow-bellied Flycatcher 359
Yellow-bellied Pipit 771
Yellow-bellied Tyrannulet 274
Yellow-billed Cotinga 98
Yellow-billed Tit-tyrant 281
Yellow-breasted Flatbill 340
Yellow-breasted Flycatcher 340
Yellow-breasted Longclaw 771
Yellow-breasted Pipit 771
Yellow-browed Chat-tyrant 381
Yellow-browed Tody-flycatcher *187*, 335
Yellow-browed Tyrant 387
Yellow-browed Wagtail 781
Yellow-cheeked Becard 453
Yellow-crested Manakin 161
Yellow-crested Spadebill 341
Yellow-crowned Elaenia 266
Yellow-crowned Flycatcher 411
Yellow-crowned Manakin 161
Yellow-crowned Tyrannulet 262
Yellow-crowned Wagtail 781
Yellow-green Tyrannulet 300
Yellow-headed Manakin *139*, 161
Yellow-headed Wagtail 781, 782
Yellow-hooded Wagtail 782
Yellow-lored Tody-flycatcher 333
Yellow-margined Flatbill 339
Yellow-margined Flycatcher 339
Yellow-olive Flatbill 338
Yellow-olive Flycatcher *229*, 338
Yellow-rumped Flycatcher 351
Yellow-thighed Manakin 144
Yellow-throated Flycatcher 411
Yellow-throated Longclaw *703*, *737*, *740*, 772
Yellow-throated Spadebill 342
Yellow-tufted Pipit 756
Yellowish Flycatcher *242*, 365
Yellowish Pipit 759
Yellowish-bellied Pipit 771
Yellowish-crowned Wagtail 781
yeltoniensis, Melanocorypha 502, 581
Yetapa 389
yetapa, Gubernetes 218, 402
Yucatan Flycatcher 431
Yucatan Rough-winged Swallow 661
yucatanensis, Myiarchus 431
yucatanensis, Pachyramphus aglaiae 460
yukonensis, Sayornis saya 374
Yungas Manakin *121*, 153
Yungas Tody-tyrant 321
yunnanensis, Anthus hodgsoni 764

Z

zaissanensis, Motacilla flava 781
zalingei, Galerida cristata 595
zamorae, Platyrinchus mystaceus 341
Zaratornis 75
zarudnyi, Ammomanes cinctura 577
zarumae, Contopus fumigatus 368
Zeledon's Manakin 151
Zeledon's Tyrannulet 259
zeledoni, Phyllomyias burmeisteri 259
zenkeri, Anthus leucophrys 753
Zimmer's Flatbill 339
Zimmer's Tody-tyrant 324
zimmeri, Hemitriccus obsoletus 321
zimmeri, Tolmomyias flaviventris 340
Zimmerius 295
zion, Galerida cristata 595
zombae, Mirafra rufocinnamomea 552
zosterops, Hemitriccus 322
zuliae, Myiopagis viridicata 266
zulianus, Machaeropterus striolatus 159
zuluensis, Mirafra africana 551

SUMMARY OF VOLUME 9

COTINGIDAE (Cotingas)
PIPRIDAE (Manakins)
TYRANNIDAE (Tyrant-flycatchers)
ACANTHISITTIDAE (New Zealand Wrens)
ATRICHORNITHIDAE (Scrub-birds)
MENURIDAE (Lyrebirds)
ALAUDIDAE (Larks)
HIRUNDINIDAE (Swallows and Martins)
MOTACILLIDAE (Pipits and Wagtails)

TECHNICAL DETAILS

- 310 × 240 mm
- 864 pages
- 78 colour plates
- 440 photographs
- 809 distribution maps
- c. 6000 bibliographical references

Any correspondence in connection with the
Handbook of the Birds of the World
should be addressed to:
Lynx Edicions
Montseny, 8
E-08193 Bellaterra
Barcelona – Spain

Telephone: 34-93 594 7710
Fax: 34-93 592 0969
E-mail: lynx@hbw.com
Internet: http://www.hbw.com

If you wish to receive further information about
the publication of future volumes or any other matter related
to this series, or about other titles published by
Lynx Edicions, please contact us by means of any of the
systems detailed above.



ISBN 84-87334-69-5